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DISSERTATION

Service Innovation in the Emerging Markets of Sub-Saharan Africa

An Analysis on the Development and Implementation of New Solutions in the Transportation Sector

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The PhD thesis can be quoted as follows:

urn:nbn:de:hbz:468-20210830-104541-8
[http://nbn-resolving.de/urn/resolver.pl?urn=urn%3Anbn%3Ade%3Ahbz%3A468-20210830-104541-8

DOI: 10.25926/etjd-4b06
[https://doi.org/10.25926/etjd-4b06]

ACKNOWLEDGMENT

This doctoral thesis is the result of a challenging but extremely enriching journey. It all started in November 2013, when I attended the One Young World Summit, in Johannesburg, South Africa, as a Volkswagen delegate. Exchanging ideas with young ambitious entrepreneurs and local tech enthusiasts at the outskirts of the city, and conceptualizing new solutions with changemakers, such as Prof. Dr. Mahmud Yunus, founder of the Nobel Peace Prize-winning Grameen Bank, have grasped my interest to better understand innovation occurring in resource-scarce settings, and more precisely, comprehend the potentials of digital technology in these environments. Excited by this challenging task, I decided to officially re-enter the academic field in Summer 2014, in collaboration with Volkswagen AG.

But an ambitious project of this size could be only done with the active support of a wide variety of people, whom I would like to express my heartfelt gratitude. First, I would like to thank my supervisor Professor Dr. Norbert Koubek, who accepted the idea of this research project with great optimism. I was privileged to benefit from his valuable expertise on emerging markets and his academic support and trust throughout the research journey. Second, I would like to thank my co-supervisor Professor Dr. Peter Witt, who accepted the role of co-supervising my dissertation and who shared important thoughts and made the time to discuss my questions. Of course, I would like to thank Professor Dr. Tarun Khanna, whom I had the chance to meet at the Harvard Business School, to discuss emergent dimensions of my model.

Likewise, I would like to thank Dr. Hendric Hallay, my supervisor at Volkswagen AG for making this research endeavor real, who showed flexibility and provided resources which have facilitated this dissertation project. I am grateful for his ongoing support and trust in the completion of this doctoral thesis. My gratitude also goes to Dr. Uttermarck and the sub-Saharan Africa strategy and sales department for sharing their expertise on the market, and for having made such a challenging geographical field accessible to me. I also wish to express my thanks to Christoph Hohmann for his ongoing support, open-mindedness and inspiring talks.

This study would not have been possible without the support of practitioners that provided the empirical data for this study. For this reason, my gratitude goes to all the interview partners in sub-Saharan Africa, especially the CEOs and CTOs of the startup firms, for their time and openness, which enabled me to gain empirical knowledge about digital service innovation in sub-Saharan Africa. Without their support and willingness to answer my questions I would not

have been able to understand the various facets of digital innovation in constrained environments.

And not to forget my family and friends, whom I would love to thank for their ongoing faith in the completion of this thesis and all the encouraging words along this journey. You know, I have you all in my heart.

Finally, and most importantly, I would like to thank my parents for their unquestioning support and understanding. I am deeply indebted to my parents who fully supported me throughout my years of study. For this reason, I would like to dedicate this work to Andreas and Brigitte Folwaczny.

Cologne, December 2020 Anna Dominika Folwaczny

DISCLAIMER

"The results, opinions and conclusions expressed in this thesis are not necessarily those of Volkswagen Aktiengesellschaft."

OVERVIEW OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

AfDB	African Development Bank
AI	Artificial Intelligence
AR	Augmented Reality
B2B	Business to Business
BoP	Bottom of the Pyramid
BRICS	Brazil, Russia, India, China and South Africa
CEO	Chief Executive Officer
CIVETS	Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa
CSR	Corporate Social Responsibility
CTO	Chief Technical Officer
FDI	Foreign Direct Investments
FTSE	Financial Times Stock Exchange
G-D	Goods-Dominant
GDP	Gross Domestic Product
GSM	Global System for Mobile Communication
HDI	Human Development Index
ICT	Information and Communication Technology
IFC	International Finance Corporation
IMF	International Monetary Fund
IoT	Internet of Things
IT	Information Technology
MINT	Mexico, Indonesia, Nigeria and Turkey
M2M	Message to Message

MNC	Multinational Corporations
MOP	Mobility Operating Platform
MSCI	Morgan Stanley Capital International
NGO	Nongovernmental Organization
NPD	New Product Development
NSD	New Service Development
OECD	Organization for Economic Co-operation and Development
ONATRACOM	Office National des Transports Commune
RBV	Resource-Based View
R&D	Research and Development
S-D	Service-Dominant
SDGs	Sustainable Development Goals
SMACIT	Social Media, Mobile Computing, Analytics and Business Intelligence, Cloud Computing and the Internet of Things
SMS	Short Messaging System
S&P	Standard & Poor's
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
USSD	Unstructured Supplementary Service Data
VC	Venture Capital

SUMMARY

The purpose of this thesis is to understand the phenomenon of digital service innovation in the context of emerging markets – environments which are characterized by severe constraints. So far, literature on constraint-based innovation in emerging markets is primarily concerned with innovations related to new tangible products that are low-priced, yet of good quality to create value for the low-income customers. As a result, little is known about the innovation processes that are inherent in the development and implementation of new services in constrained environments.

To address this severe research gap, this thesis integrates insights from existing innovation literature on emerging markets and literature on service innovation, which so far, is predominantly conducted in the developed market context. More specifically, this study adopts the service-dominant logic to shed light on the service innovation activities and practices local innovators performed to develop and implement new services. Departing from this view, the focus is on specialized competences, such as knowledge and skills (intangible resources) that are applied through activities, practices, processes and performances to create beneficial value for the local user.

Based on the examination of six digital service innovations in the transportation sector in three sub-Saharan African economies (Kenya, Nigeria and Rwanda), this study identifies various activities and practices performed to develop and implement new digital services. This thesis suggests six service innovation practices, organized in two main practice categories that were foundational for creating value in constrained environments. These two overarching practices comprised platform-based and integrational practices, which are labeled as “leveraging digital platform capabilities” and “integrating into socio-cultural context”. Furthermore, analyzing the interplay between the complexity of constraints, practices and value creation has unveiled a specific innovation capability, denoted as designing for multidimensional value.

Overall, this thesis makes three key theoretical contributions on the debate on innovation practices and capabilities relevant for emerging markets. First, this study provides a refined understanding of contextual constraints pertinent in emerging markets, by elucidating the low level of trust as a major obstacle for building effective service exchange relationships. More specifically, the study suggests the explicit incorporation of trust into the theorization of digital service innovation in institutionally deficient environments due to its capacity to intermediate transactions. Second, the foundational role of digital platforms is highlighted. Platforms were

found to be important generative instruments in resource-constrained environments, as they drive resource accumulation and resource generation. Furthermore, digital platforms were helpful to provide structure and organization for service exchange processes among a variety of actors. Third, in view of the complexity of problems and the unpredictability of the local business environment, this thesis highlights the role of a design-centered approach to service development. More specifically, the capability of designing for multidimensional value is considered a vital competence to create valuable solutions for the emerging market context and to address wicked problems. In sum, this thesis concludes that digital service innovation provides tremendous potential for young emerging market economies but needs to be developed and implemented in congruency to the resources, institutions, trust levels and capacities of the local users and the social system.

PREFACE

This thesis departs from the intersection of two significant developments, which are captured in this preface. First, the nature and process of innovation has undergone radical shifts in the past decade, driven by the rapid penetration of digital technology. Resulting from these shifts in the innovation landscape, the role of digital service innovation has gained increased attention over tangible innovation.[1] Second, practitioners and researchers increasingly shift their attention to a group of dynamically growing economies in sub-Saharan Africa, that are leveraging the new potentials provided by the rapid expansion of these technological advancements to leap-frog inefficient systems. This preface outlines these two major developments before the scholarly debate begins.

Innovation Research at a Transition Point

The nature and process of innovation has gone through a profound transformation in the past decade,[2] largely driven by the rapid penetration of the Internet. The recent advancements in ICTs increasingly disrupt stereotypical thinking of what innovation is and what it is not. Indeed, for a long time, innovation has been associated with the creation of a new product, an engineered physical object, and often explained in terms of its links with technological innovation. Accordingly, it has been often thought of as being concentrated in a few, leading high technology sectors, based upon intense research and development (R&D) efforts, large expenses and patents, and thus often developed by large organizations with abundant financial resources. Hence, traditional innovation research was primarily concerned with technical innovation, especially technical product and process innovation, in the manufacturing sector in developed economies.[3] Innovation was regarded as the "industrial religion of the late 20th century"[4], as the Economist allegorized it. This concentration on technical artefacts developed by high technology industries[5], yet, experiences changes.[6]

Indeed, it is increasingly argued that the nature and process of innovation has substantially changed in the digital age. According to Lusch & Nambisan these shifts in innovation can be characterized in particular by three novel features: network-, information-, and experience-

1 Cf. Edwards-Schachter (2018), pp. 65-68..
2 Cf. Benner & Tushman (2015); Lusch & Nambisan (2015).
3 Cf. Martin (2016), p. 434.
4 The Economist (1999).
5 Cf. Garcia & Calantone (2002), p. 112.
6 Cf. Martin (2013), pp. 170-183; Edwards-Schachter (2018), pp. 66-67.

centricity.[7] Vanishing is the idea, that innovations are only developed from within the confines of large corporate R&D labs.[8] Instead, innovation is viewed as evolving from dynamic networks of actors with diverse goals who engage in collective action.[9] Organizations from various sectors increasingly incorporate third parties to co-develop innovative solutions, as for example, by investing in crowdsourcing, collaborating with public institutions, as well as engaging in co-creation with customers and startups.[10] Furthermore, the focus no longer is exclusively on tangible goods, but increasingly on intangible offerings where the information content is high. Finally, the focus has shifted from the attributes of the innovation outcome to the value or customer experience, that is co-created with other actors.[11]

An increasing number of innovation examples are not primarily technological in nature. Especially, innovations originating from the service sector. Service innovation are often characterized by a change in the design of an organizational system comprising people, information flows and processes. This dematerialization allows to create value according to a different logic,[12] as represented by companies, such as Facebook, YouTube, Airbnb, Uber, Netflix, and Google.[13] Innovation researchers argue that these digitally enabled services require deep knowledge of a range of IT systems, and the ability to combine diverse sets of activities from different sectors and tools in new and productive ways.[14] Particularly, the drastic improvements in the price/performance of digital devices, especially computers and mobile phones, and the broad availability of the Internet have made these breakthrough innovations technically feasible and economically viable. In addition, the digital tools necessary for innovation have become more affordable to a broad spectrum of innovation actors. With these lowered entry barriers and expedited diffusion rates, digital technology has "democratized innovation"[15] so that almost everyone from everywhere can now participate in innovation, access relevant resources, and create value.[16]

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7 Cf. Lusch & Nambisan (2015), pp. 155-156.

8 In contrast to the traditional closed Chandlerian view, where the firm is the focal actor, digitization is pushing innovation increasingly outside of firm boundaries, where the community becomes the core for innovation. This "open innovation" (Chesbrough (2003)) is most clearly seen in open source software development (Benner & Tushman (2015), p. 505).

9 Cf. Chesbrough (2003), pp. 43-47; Nambisan & Sawhney (2007), pp. 1-3.

10 Cf. Fagerberg et al. (2013), p. 6; Weiblen & Chesbrough (2015), p. 66.

11 Cf. Prahalad & Ramaswamy (2004b), p. 11; Vargo & Lusch (2004), p. 6; Vargo & Lusch (2008), p. 3.

12 Cf. Goldstein et al. (2002), p. 121.

13 Cf. Lusch & Nambisan (2015), p. 156.

14 Cf. Salter & Alexy (2014), p. 42.

15 von Hippel (2005), p. 1.

16 Cf. Yoo et al. (2010), p. 726.

With the rapid diffusion of information and communication technology (ICT), a growing number of social actors leverages these cheap tools to create change across different economies and sectors. In face of the growing number of global societal and economic challenges, such as raising inequality, climate change, political conflicts, waves of migration at Europe's shores and more recently the global COVID-19 pandemic, civil society actors, social activists, social movements, social entrepreneurs, and nongovernmental organizations (NGOs), among others, with creative capacities can now access tools, knowledge and resources to develop solutions that tackle these issues. Yet, much of this growing amount of socially oriented innovation activity, which is often incremental, not materialized in the form of a tangible product innovation and based upon little or no formal R&D as well as not patented, often remains invisible, because conventional measurement indicators, such as R&D funding, numbers of researchers and patents cannot capture these innovation activities and outcomes.[17] It is increasingly argued that the conceptualization and the analysis of innovation is rooted in the past,[18] incapable of examining these less visible but vital forms of innovation.

These dramatic changes in the innovation landscape have in common that they are driven by the expanded role of information technology (IT). In view of the changed dynamics and shifts in the innovation landscape, it is increasingly claimed that managers and researchers should not give primacy to tangible technical innovation over other types of innovation.[19] Recent research, therefore, has begun to stimulate a debate about the future of innovation studies.[20] For instance, Martin notices that the challenge to the next generation of innovation researchers is to develop adequate conceptualizations of innovation and come up with improved methods and indicators for recognizing, measuring, and understanding these hidden so-called "dark innovation" or "below-the-radar innovation".[21] In addition, with a growing demand for innovation that is oriented towards sustainability[22] and socio-economic well-being, researchers argue that there is a growing need to study innovation beyond Western paradigms, considering paradigms and experiences from emerging economies.[23] Many of these less visible innovation efforts or dark innovation activities can be found in the geographical spheres of developing and emerging market economies. Innovation in these economies is less associated with technological

17 Cf. Martin (2016), p. 433.
18 Cf. Benner & Tushman (2015), p. 498.
19 Cf. Salter & Alexy (2014), p. 42.
20 Cf. Fagerberg et al. (2013), pp. 5-14; Lundvall (2013), pp. 202-208; Dodgson et al. (2014), pp. 3-24.
21 Cf. Martin (2016), p. 434.
22 Cf. Pansera & Sarkar (2016), pp. 1-2.
23 Cf. Chen et al. (2018), p. 2; Edwards-Schachter (2018), p. 68.

breakthroughs or as being new to the world and, thus, is not considered as contributing valuable insights to technological advancement.[24] These innovations often differ drastically from Western innovation in terms of product novelty and disruptiveness and are rather linked to social innovation.[25] The rapid penetration of ICTs across economies creates a fruitful ground for innovative solutions addressing a wide variety of needs in emerging markets. Contextualizing digitally enabled service innovations in resource-constrained environments, thus, appears as a fruitful approach to shed light on the digitally driven service innovation processes performed under conditions of scarcity, for both researchers and practitioners.

Shifts in the Emerging Market Landscape

Emerging markets and developing countries have become the center of economic gravity over recent decades.[26] Together, these economies are home to 85% of the world's population,[27] equaling to six billion people and accounting for more than half of the world's gross domestic product (GDP). They are growing faster than advanced economies,[28] and their share of economic growth is projected to increase from 76% in 2019 to about 85% in 2024.[29]

The rapid rise of economies such as Brazil, Russia, India, China, and South Africa, commonly referred to as the BRICS, has attracted a lot of attention from investors, executives and scholars. The fastest sustained economic expansion by a major economy in history, yet, was observed in China,[30] with a GDP growth average of almost 10% per year since its economic reforms in 1978, while India's GDP growth rate averaged at 5,8% in the same time period.[31] The key drivers of this economic growth in these economies have primarily been a process of rapid industrialization combined with trade liberalization and increased integration into the global economy. Relatively low labor-costs and lowered trade barriers further spurred resource-intensive manufacturing activities in large-scale industry sectors and, as a result, fueled growth

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24 Cf. Pansera & Owen (2018), pp. 23-24.
25 Cf. Winterhalter et al. (2017), pp. 3-4.
26 Cf. Pacek & Thorniley (2007), pp. 1-2.
27 Cf. Lagarde (2016).
28 Note: The effects of the global COVID-19 pandemic on emerging markets have not been taken into account in this study, as the macroeconomic analysis was finalized in January 2020.
29 Cf. IMF (2019), p. 13.
30 Led by China's dynamic growth, Asia's share of the global economy has rocketed up to more than 34%. This trend is likely to continue in the next years. The U.S. and EU accounted for almost 50% of the global economy in 1980. Today their combined share has decreased to 31%.
31 Period between 1978-2016. Based on own calculations drawn from data published by the World Bank (2020b).

in exports.[32] Over time, these economies transitioned from mere manufacturing hubs[33] to strong domestic economies with an expanding middle-income class, actively demanding a variety of products and services. Yet, this growth path has also led to socio-economic and environmental imbalances, requiring a shift in the structure of the economy.[34] More recently, China's economic growth has slowed down significantly, from a high of 14.2% in 2007 to 6.7% in 2018 and 6.1% in 2019 respectively.[35] The International Monetary Fund (IMF) projected growth to fall to 5.5% by 2024.[36] China needs to embrace a new economic growth model, that depends less on export and that leverages new sources of growth, such as private consumption, services and innovation to drive economic growth.[37]

Scholars and investors have focused their attention primarily on the group of advanced emerging economies, especially the BRICS, largely neglecting the dynamic developments in other vibrant low- and middle-income regions and economies (Figure 1).[38] This is unfortunate considering that out of the 25 countries forecasted to grow the fastest over the next five years are located in regions that have been largely neglected in the past.[39] Most of these economies also belong to the group of the so-called frontier markets,[40] which represent low-income, high-risk countries, but are considered to be "promising candidates to become part of a second generation of 'emerging market' countries"[41]. These smaller economies exhibit high GDP growth rates, improved political structures and favorable demographics, as reflected in a relatively large and young urbanizing population. In addition, the rapid penetration of ICTs is creating a fertile ground for new growth opportunities in sectors such as agriculture, retail, finance, infrastructure, transportation, natural resources, and telecommunications.[42] Among these rapidly growing frontier markets are also five sub-Saharan African economies, including Botswana, Ivory Coast, Ghana, Kenya and Nigeria. The central reason for excluding these African lions is that there are only two internationally recognized African emerging markets: Egypt and South Africa.[43] Academic research is often biased in favor of developed economies

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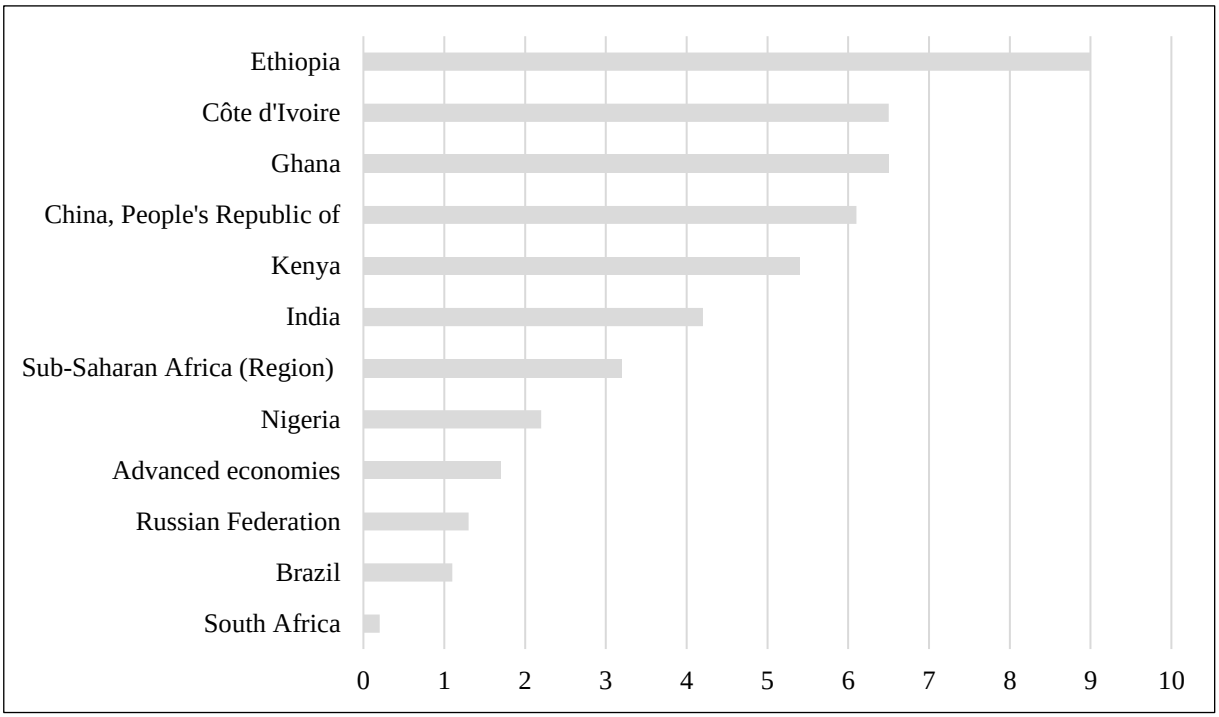
32 Cf. Sit & Liu (2000).
33 China's rising wages may also erode its competitiveness in low-end manufacturing and could therefore further increase foreign direct investment (FDI) inflows to Africa.
34 Cf. World Bank (2020c).
35 Cf. World Bank (2020b).
36 Cf. IMF (2019), p. 14.
37 Cf. World Bank (2020c).
38 Cf. Kehl (2007), p. 2; Hoskisson et al. (2013), p. 1296.
39 Cf. Mussachio & Werker (2016), p. 42.
40 See Appendix 1.
41 Nellor (2008), p. 30.
42 Cf. Chironga et al. (2011), p. 118.
43 Cf. Kehl (2007), p. 2.

and large emerging markets, while rapidly growing economies in less developed regions remain "off the researchers' radar".[44] Hence, research on emerging market regions, such as sub-Saharan Africa with a focus on the context constraints and how to respond to them, is a microcosm relative to the research devoted to the larger advanced emerging market economies.

So far, practitioners and researchers tend to adopt a dichotomous worldview that divides the world into a few emerging and developed economies, resulting in a simplified understanding of the development path of young emerging markets. For instance, considering Africa's massive population growth, reaching 1.5 billion people by 2025, analysts wondered, if the region was set to replicate the rapid industrialization and exceptionally high growth rates observed in Southeast Asia in the 1980s and 1990s. Particularly for the continent's largest economies, this has not happened yet.[45] African economies are achieving growth performance with quite different sectoral patterns.[46]

Figure 1: GDP Growth Rates of Selected African Economies, the BRICS and Advanced Economies (in %)



Source: IMF, October 2020, World Economic Outlook Database.

For example, the share of the agricultural sector declined in many countries, but increased in Kenya and Tanzania, while the manufacturing sector increased in only a few countries (Niger,

44 Zoogah et al. (2015), p. 7.
45 Cf. UNECA (2016), p. 7.
46 See Appendix 2.

Nigeria and Uganda) or remained at constant levels. Interestingly, service sectors were important drivers of growth in many countries.[47] Some analysts warn against adopting the three-sector approach[48] for understanding the group of young emerging market economies located in Africa because it might be misleading.[49] It is recommended to investigate the cultural diversity and historical-political idiosyncrasies and to explore the development paths of these underexamined regions or countries from this perspective to avoid the potential fault of making broad generalizations across these economies. Policy-makers and multinational companies have often adopted a "less developed countries" mindset, viewing emerging markets as being at an early stage of the same development path of advanced or developed countries, whereby development is associated with the level of industrialization.[50]

More recently, some researchers argued that it is time to extend research to these less examined regions to inform new theories that reflect local realities.[51] In this vein, it is increasingly claimed to adopt a more nuanced perspective of the emerging market context "… with all its inbuilt complexities and incongruities"[52] to better understand market heterogeneity and specific characteristics from a micro instead of a macro-level view.[53] To respond to these claims of a more fine-grained perspective, this study aims at shedding light in the sub-Saharan African business setting in the next chapters.

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47 Cf. AfDB (2016), p. 32. See Appendix 2 (figure below).

48 According to the traditional three-sector theory, the share of the primary sector (agriculture and extractive industry) in overall activity is high during early stages of development but tends to decline as economies develop. The share of the secondary sector (manufacturing) increases during the low and middle stages of development and declines at higher income levels when labor costs make manufacturing less competitive. In contrast, the share of the tertiary sector (services) continuously increases and becomes most important at higher income levels (ibid, p. 48).

49 Cf. ibid, pp. 31-32.

50 Cf. Arnold & Quelch (1998), p. 9.

51 Cf. Hoskisson et al. (2013), p. 1316; Zoogah et al. (2015), pp. 21-23.

52 Alvstam et al. (2016), pp. 38-40.

53 Cf. Merchant (2016), pp. 19-20.

1 INTRODUCTION

> *I believe actually having digital technology as an input into the way of providing services with a predicate that people are likely going to be in 3G/4G Internet coverage with super cheap android smartphones means there is a new way of developing services, that I think can be cheaper and have a bigger impact, as an input factor! The world can move fast. And many African countries are consumer countries that want new services. (Chief Executive Officer (CEO) Motorcycle Taxi)*

Serving as an introduction to this dissertation, this chapter proceeds as follows: First, it presents the problem statement from a practical and theoretical point of view, including the identified research gap and the research question this study addresses (1.1). Then the research objectives are described (1.2), followed by the outline of the overall dissertation (1.3).

1.1 Problem Statement

Africa is increasingly garnering the attention of entrepreneurs, corporate leaders and scholars as an emerging market with new opportunities for innovation and growth. Until recently, the region has been considered too poor and too corrupt to do business in. However, the rapid penetration of information and communication technologies – mobile Internet and mobile computing in particular – has provided tremendous new opportunities. In 2016, the mobile industry generated $110 billion of economic value in sub-Saharan Africa, equivalent to 7.7% of GDP.[54] The continent has gained prominence as the hotbed for mobile money.[55] One of its greatest success story is the M-Pesa money transfer service, which has significantly improved the life conditions of millions of Kenyans who were previously excluded from the financial system but who now have access to a growing set of financial services through the combination of mobile networks and devices.

The continent's mobile industry is now expanding across other sectors.[56] In 2025, half of the people on the continent will have Internet access. This is a tremendous chance for tech entrepreneurs, who are willing to 'hack' existing infrastructure gaps through technology, connecting Africans to new services.[57] Another opportunity area for service innovation with

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54 Cf. GSMA (2017), p. 3.

55 According to the State of the Industry Report on Mobile Money (2019), it was estimated that in Europe and Central Asia around 200 million transactions were made via cell phone in 2019. By comparison, sub-Saharan Africa leads the way in mobile payment with 23.8 billion transactions in the respective year.

56 Cf. GSMA (2019), p. 26.

57 Cf. McKinsey (2013).

large scale potential, which entrepreneurs are increasingly addressing, is transportation poverty. Today, most of the population in sub-Saharan Africa is limited in their ability to move from A to B to manage their daily chores and to access relevant centers of economic activities, such as work, schools, and administrative agencies. Travelling in the city by public means is tedious, costly, and dangerous, while private motorization remains low. Digital technology provides dramatically new opportunities for providing better access to transportation and at lower costs, as emergent players in this sector have demonstrated.

Of late, researchers have urged to elucidate on the process by which emergent digital technology is leveraged to develop new services in constrained environments. Scholars, thereby, stress to elucidate the influence of technological advancements, such as the Internet, mobile telecommunications, mobile computing, digital platforms and big data, on the innovation process, with a special focus on the emergence of new services given their linkages to digital technology.[58]

In the recent past, the literature on innovation was primarily concerned with innovations related to technical artifacts with new functionalities or in other words, new physical products, and much less is known about innovation processes that are constitutional for the development of new services in resource constrained environments. A few well-known examples from this product-centered perspective include the affordable disinfectant soap created by Unilever and the $2000 Nano car designed by Tata Motors. Moreover, much of the empirical research on service innovation to date has been conducted in developed countries.[59] Yet, emerging markets claim a different genre of innovations compared to mature markets.[60] Emerging markets are typically known to be difficult environments for innovation compared to their Western counterparts, due to the distinct conditions in these economies. The persistence of issues such as poor infrastructure, volatile institutions, limited technological skills and know-how, as well as the large share of the population with low income, are major obstacles for doing business in these environments.

While research has revealed some valuable insights on the innovation process of constraint-based innovation in general, little is yet known about the specific innovation activities and practices inherent to new service development (NSD) in emerging markets. Considering these

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58 Cf. Barrett et al. (2015), pp. 147-150; Agarwal et al. (2017), p. 3
59 Cf. Droege et al. (2009).
60 Cf. Khanna et al. (2005), p. 5.

transformational effects of digitally enabled service innovation in emerging markets, it is of practical and theoretical relevance to gain a better understanding of how innovators innovate with digital technology in the most challenging world regions, yet so far, has been largely neglected in the existing research. This severe gap has motivated the following research question:

How do innovators develop and implement digital service innovation in the context of emerging markets?

1.2 Research Objectives

The major aim of this thesis is to engage in the ongoing debate about local innovation strategies and relevant capabilities in emerging markets. More specifically, this thesis seeks to identify specific service innovation activities and practices that entrepreneurs pursue in emerging markets and the competences they developed, while leveraging digital technology. To do so, this study adopts the service-dominant (S-D) perspective, which appears to be well suited for this purpose.

So far, research on innovation in emerging markets is usually conceptualized through a product- or goods-centered perspective, where innovation occurs by developing and providing frugally engineered new products to the underserved segments of the population. Accordingly, prior innovation studies have tended to apply formalized innovation process models that are based on principles from new product development (NPD) research to investigate the development and implementation of frugal products in emerging markets. Service innovation, thereby, is viewed as a sub-category of a product. Innovation literature targeting emerging markets seems to have ignored theoretical developments in the service innovation literature. Of late, researchers have contributed to a growing literature on the phenomenon of digitally enabled service innovation by adopting the S-D logic, suggesting an integrative understanding of the term service to understand and explicitly incorporate IT capabilities. The S-D logic defines a service as "the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself".[61] Consequently, S-D logic focuses on the process of serving rather than on producing and offering a tangible product,[62] and thus appears to be an apt perspective in understanding how innovators

[61] Vargo & Lusch (2004), p. 2.
[62] Cf. Lusch & Nambisan (2015), p. 156.

use ICTs to serve people in emerging markets to improve access to basic services, such as transportation. So far, only little attention has been given to the contextualization of digital service innovation in emerging markets. More specifically, what constraints innovators experience and how they innovate to responded to them and make the service work, has been neglected.

Considering these severe gaps in the innovation management literature on emerging markets and the fact that the theoretical discourse on innovation strategies targeting theses environments appears to be linked to the past – in being synonymous with a sole focus on tangible products[63] and ignoring the transformational power of digital technology in these environments – creates three further objectives for this study. The first aim is to contribute to the understanding of developing and implementing innovation in the context of emerging markets, in consideration of technological advancements. More specifically, the goal is to develop a theoretically grounded model of developing and implementing digital service innovation in constrained environments. Hence, if the assumption is that to be successful in emerging markets means providing cost-effective and easy-to-use solutions, it is important to understand how technology is leveraged to achieve these key outcomes and what activities and practices are pursued to develop and implement these services successfully. This also involves examining the emergence of activity patterns and competences that evolve from these innovation activities. These insights shall be aggregated into a model to explain how innovators leverage digital technology to create constraint-based service innovations.

The second aim of this investigation is to develop further empirical findings of innovation activities and practices in emerging markets. So far, innovation management literature has produced a limited number of rigorous empirical studies, largely based on anecdotal evidence, trying to identify new strategies of developing and implementing innovative solutions in emerging economies. This study examines six tech startups from the transportation sector and conducts a cross-case analysis to elucidate successful and less successful service development practices.

The third objective involves devising practical implications. This means to provide recommended actions for those entrepreneurs and large firms that aim at creating value in these environments; value that is beneficial for the local society and that simultaneously allows

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63 Cf. Sawhney et al. (2006), p. 75.

innovators to capture value from their purposeful actions. Beyond that, the study aims at sensitizing policy-makers, corporate leaders and entrepreneurs for the potentials and limitations of digital technologies in the context of emerging markets in creating valuable services to the society. Finally, this study also serves as an inspiration for large Western firms with growing servitization ambitions and in search of new growth opportunities to also pay attention to the hidden solutions developed by the tech startup ecosystem in sub-Saharan Africa.

1.3 Organization of Research

To investigate the research question, this study first provides a theoretical understanding of relevant terms and concepts spanning the first two Chapters (2 and 3). Particularly, Chapter 2 relates to the specifics of the emerging market context. It provides a definition (2.1) of the term and reviews its key characteristics (2.2), namely institutional voids and resource constraints. Subchapter 2.3 provides insights on the macroeconomic development of the sub-Saharan African region and points to its rising economies. Furthermore, this chapter thoroughly defines the term innovation by looking at the early conceptualization of innovation, as introduced by J.A. Schumpeter and complementing it with the current definition provided by the Organization for Economic Co-operation and Development (OECD) in the Oslo Manual (2.4). Eventually, Subchapter 2.5 provides an overview of resource-constrained innovation approaches, typically prevalent in emerging markets. This chapter terminates with summarizing thoughts and the limitations of this genre of innovation concepts in capturing and explaining the emergent phenomenon of digitally enabled service innovation in these environments.

Chapter 3 introduces the S-D logic, as an adequate lens to investigate the underlying research question and to provide an understanding of service innovation. First, in Subchapter 3.1, the S-D perspective is contrasted with the traditional goods-dominant (G-D) logic to create a better understanding of its foundations. Subchapter 3.2 provides the broadened definition of the term “service innovation” applied in this study, and Subchapter 3.3 sheds light on the core dimensions of service innovation. To better understand the expanded role of IT in the context of service innovation, Subchapter 3.4 reviews the key characteristics of digital technology, including its underlying architecture, transformative capabilities, and the role of digital platforms. Departing from these relevant considerations, Subchapter 3.5 elucidates key activities and practices of developing new services, by outlining prominent service innovation process models. This chapter ends with a summary, also stressing the shortcomings in the service innovation literature targeting emerging markets (3.6).

Chapter 4 deals with the research design and the methodology of the underlying dissertation. It begins with an outline of the paradigmatic positions (4.1) and differentiates between qualitative and quantitative research methodologies (4.2), while also justifying the research methodology adopted in this study. In Subchapter 4.3, this study briefly presents the case study research approach, which provides guidance for generating empirically substantiated insights. After presenting the research design, the data collection methods are portrayed (4.4) and the data analysis (4.5) is outlined. Finally, the quality criteria are discussed (4.6).

The empirical findings of this study are presented in Chapter 5. This chapter provides a summary (5.1) of the two key service development approaches adopted by the six cases under investigation and elucidates major differences of how innovators developed and implemented digitally enabled service innovation in the context of emerging markets. Afterwards, the specific findings are presented section by section (5.2-5.5) according to the identified aggregate dimensions and second-order themes.

In Chapter 6 the midrange theoretical model from the case-based, empirical evidence is presented (6.1). Subchapter 6.2 illustrates the recognition of opportunities for service innovation in emerging markets. Then, the individual components of the model as well as the relationships among them are discussed at the backdrop of the extant literature (6.3-6.6).

Chapter 7 provides the key theoretical contributions of this inquiry. In Subchapter 7.1, the low level of trust is discussed as a context feature of emerging markets with relevant implications for service development and implementation practices. Thereafter, in Subchapter 7.2 the role of digital platforms, as constituent element of service innovation, is elucidated as both providing an effective tool for mediating transactions in institutionally volatile environments and as a generative space for value creation despite the scarcity of available resources. The third Subchapter (7.3) presents the implications for the theoretical debate on relevant innovation capabilities in emerging markets by emphasizing the role of a distinct design capability, understood as a relevant meta-capability in complex and unpredictable environments. This chapter also provides relevant practical implications (7.4) and concludes with the limitations of this investigation and the avenues for future research (7.5).

Finally, Chapter 8 summarizes the key findings and terminates with final remarks on the future of digital innovation in emerging markets for both researchers and practitioners.

2 INNOVATION IN EMERGING MARKETS

This chapter first defines the term emerging markets (2.1) and briefly reviews the distinctive characteristics of these contexts (2.2). It then illustrates the macroeconomic development of sub-Saharan African emerging markets (2.3). Afterwards a definition of innovation is provided (2.4) as terminological base. Then the focus shifts to innovation approaches pertinent in emerging markets (2.5). This chapter terminates with an evaluation of the state of innovation research in constrained environments (2.6).

2.1 Definition of Emerging Markets

Emerging markets or emerging market economies continue to gain prominence in terms of both their contributions to global GDP as well as to FDI.[64] Especially, the rapid rise of economies such as China and India has captivated broad attention from investors, corporate executives, and scholars. This fascination with emerging markets has, however, led to a proliferation of country groupings and acronyms such as the BRICS[65] (Brazil, Russia, India, China and South Africa), MINT (Mexico, Indonesia, Nigeria and Turkey), Next Eleven (Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey and Vietnam) and CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa) and the emergence of country lists. These groupings and listings are regularly tracked and updated by global financial institutions, such as the International Monetary Fund (IMF), the Financial Times Stock Exchange (FTSE), Morgan Stanley Capital International (MSCI), Standard and Poor's (S&P) and the Dow Jones.[66] Despite this widespread interest in emerging markets, there is a lack of consensus of what constitutes an emerging market.[67] Terms, such as "developing countries", "emerging markets" and "transition economies" are often used interchangeably, which often leads to terminological confusion.

Originally, the term emerging markets was coined by fund manager Antoine van Agtmael at the International Finance Corporation (IFC)[68] in 1981, when the group was promoting the first

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64 Cf. Hoskisson et al. (2013), p. 1295.

65 The acronym was popularized in 2001 by Jim O'Neill, then-chairman of Goldman Sachs Asset Management, in his publication *Building Better Global Economic BRICs* (O'Neill (2001), p. 1). After being formally invited by China, South Africa joined the BRIC grouping in 2010. The group, thus, was renamed BRICS.

66 Cf. Marquis & Raynard (2015), p. 297.

67 Cf. Kehl (2007), p. 3; Anushkina et al. (2016), p. 3.

68 The IFC belongs to the World Bank institution. It is the largest global development institution, focused exclusively on the private sector.

mutual fund investment in developing countries.[69] Previously, countries outside the group of developed countries were referred to as "poor countries", "under-developed countries", or "The Third World", suggesting hopelessness, obscurity and inferiority. The term "emerging market" contrasted with this picture rife of negative associations, as it sounded more invigorating and conveyed a sense of "progress, uplift and dynamism"[70], necessary to present these emerging stock markets as promising investment candidates.

With their growing economic relevance, academics and global institutions introduced diverse definitions and categories to better analyze and organize the complexity of the international panorama. For example, according to the MSCI Market Classification Framework, emerging markets encompass a group of low-to-middle income countries with a sustainable economic development and a sizable stock market that is accessible for foreign investors.[71] The World Bank[72] denotes those economies as low-to-middle income economies if they indicate a gross national income per capita between $995 and $3,895.[73] A different approach is applied by the IMF. In its World Economic Outlook, the IMF divides world economies into two major groups: advanced economies on the one hand and emerging markets and developing economies on the other,[74] based on (1) per capita income level, (2) export diversification[75] and (3) the degree of integration into the global financial system.

Table 1 provides a list of countries considered emerging markets across these categorizations. The problem with these classifications is that they often do not consider most developing economies having functioning markets at all. This has disproportionally negative consequences for most African economies, except for Egypt and South Africa, by excluding discussions about the development of these markets.[76] This is unfortunate, because selected African countries demonstrate substantial improvements across various dimensions and some of them also belong to the group of frontier markets.

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69 IFC (2016), p. 47.
70 van Agtmael (2007), p. 5.
71 Cf. MSCI (2014), p. 1.
72 In the 2016 edition of its World Development Indicators, the World Bank made the decision to no longer distinguish between 'developed' and 'developing' countries in the presentation of its data.
73 Cf. World Bank (2020d). See Appendix 6 (as per 2019).
74 See Appendix 7.
75 This means that oil exporters that have high per capita GDP would not make the advanced classification because around 70% of their exports are oil.
76 Cf. Mwenda (2000), p. 9.

Table 1: Emerging Markets Identified by Major Investment Classification Sources

Country	IMF[a]	FTSE[b]	S&P[c]	MSCI[d]	Dow Jones[c]
Algeria	x				
Angola	x				
Argentina	x			x	
Azerbaijan	x				
Belarus	x				
Brazil	x	x	x	x	x
Chile	x	x	x	x	x
China	x	x	x	x	x
Colombia	x	x	x	x	x
Czech Republic		x	x	x	x
Croatia	x				
Dominican Republic	x				
Ecuador	x				
Egypt	x	x	x	x	x
Greece		x	x	x	x
Hungary	x	x	x	x	x
India	x	x	x	x	x
Indonesia	x	x	x	x	x
Iran	x				
Kazakhstan	x				
Korea				x	
Kuwait	x	x			
Libya	x				
Malaysia	x	x	x	x	x
Mexico	x	x	x	x	x
Morocco	x				
Oman	x				
Pakistan	x	x	x	x	x
Peru	x		x	x	x
Philippines	x	x	x	x	x
Poland	x		x	x	x
Qatar	x	x	x	x	x
Romania	x	x			
Russia	x	x	x	x	x
Saudi Arabia	x	x		x	
South Africa	x	x	x	x	x
Sri Lanka	x				
Taiwan		x	x	x	x
Thailand	x	x	x	x	x
Turkey	x	x	x	x	x
Ukraine	x				
United Arab Emirates	x	x	x	x	x
Uruguay	x				
Venezuela	x				

[a] See IMF Fiscal Monitor, April 2020, https://data.imf.org/?sk=4BE0C9CB-272A-4667-8892-34B582B21BA6

[b] See FTS Russels country classification, September 2019, https://research.ftserussell.com/products/downloads/FTSE-Country-Classification-Update_latest.pdf

[c] See S&P Dow Jones Indices' 2019 Country Classification, www.spglobal.com/spdji/en/search/?query=S%26P+Dow+Jones+Indices%E2%80%99+2019Country+Classification+

[d] See MSCI Emerging markets list, https://www.msci.com/market-classification

Source: Own illustration.

According to Khanna & Palepu, these capital-market-based definitions of emerging markets reflect only symptoms of underlying market structures. They further argue that these conceptualizations highlight important and persistent characteristics which make these economies fundamentally different from their developed counterparts, but these conceptualizations do not provide insights on the quality of these markets. Yet, market structures are the outcome of the interplay of idiosyncratic historical, political, legal, technological, economic and cultural factors, whereas their severity varies from country to country. This also implies that due to these distinct context factors the economic development might follow a different path, contrasting with that of Western industrialization, because the initial conditions in these markets were different (e.g., due to colonization) and remain so.[77] These facts make it difficult to determine the performance of markets by quantitative indicators solely. Gupta, who conducted a study of financial markets in developing countries in 1984, found that financial markets have sometimes encouraged development and at other times have resulted from development.[78] Hence, pursuing a definition that is solely based on a set of quantitative indicators – evaluating the maturity and expansion of capital and stock markets – does not seem to adequately reflect the market development process and new market dynamics, driven by the rapid diffusion of ICTs, resulting in changes of social and economic life and new growth opportunities across different sectors.[79]

Accordingly, a different understanding of emerging markets is necessary to examine young emerging markets with their idiosyncratic dynamics and opportunities.[80] Khanna & Palepu, developed a different conceptualization, by defining emerging markets as "… those transactional arenas where buyers and sellers are not easily or efficiently able to come together"[81], because market-supporting institutions are absent or poorly functioning. They explain that the existence of "institutional voids" makes a market 'emerging' and is a prime source of the higher transaction costs in these markets.[82] Similarly, Hoskisson et al. postulate that a country's degree of institutional development and its endowed factor markets represent key elements that determine an economy's opportunities and influence business activities.[83] This qualitative understanding of emerging markets appears to be an adequate point of

77 Cf. Khanna & Palepu (2010), p. 6.
78 Cf. Gupta (2013b).
79 Cf. Hoskisson et al. (2013), pp. 1295-1298.
80 Cf. Kehl (2007), p. 3.
81 Khanna & Palepu (2010), p. 6.
82 Cf. ibid.
83 Cf. Hoskisson et al. (2013), p. 1297.

departure for analyzing on the ground dynamics of the sub-Saharan Africa's young emerging markets that remain absent in most of the literature on emerging markets and country lists. Therefore, this thesis follows Khanna's definition of emerging markets for the remainder of this inquiry, considering emerging markets as arenas with immature institutional infrastructures. Based on this understanding, the next subchapter provides an overview of the macroeconomic development of the African continent.

2.2 The Rise of African Emerging Markets

Africa is the world's second largest continent, covering a land area of over 30 million square kilometers[84], equal to the size of the U.S., China, India, Japan, Mexico and many European countries, combined.[85] It is also the second most populous world region, inhibiting 1.2 billion people.[86] And being home to 54 different nations with 2,000 spoken languages.[87] Furthermore, six of the world's ten fastest-growing economies are located in sub-Saharan Africa. In the global economy, the region has gained a prominent position, mainly due to its wealth in natural resources. About 30% of the world's minerals are found in Africa.[88] It also contains 90% of the world's entire reserves of platinum and cobalt, 50% of global gold reserves and 35% of the world supply of uranium.[89]

As a result, Africa achieved an impressive average economic growth of 5% between 2000-2014 rising from just above 2% during the 1980-90s, driven by its exports of natural resources.[90] Growth has decelerated to 3.6%[91] in 2015 and to 2.2%[92] in 2016 due to weaknesses in the global economy and the dramatic price fall of key commodities. Africa's economy is slowly recovering, having reached a growth rate of 3.5% in 2018 and being projected to accelerate to more than 4% in the coming years, which is higher than that of other emerging and developing countries.[93]

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84 Cf. Desjardins (2020).
85 See Appendix 3.
86 Africa's population has grown from its estimated 478 million in 1980 to the current estimate of close to 1.2 billion, and is projected to increase to 1.5 billion by 2025 and 2.4 billion by 2050 (UNECA (2016), p. vii).
87 Cf. George et al. (2016), p. 381.
88 Cf. AfDB (2016), p. 3.
89 Cf. AfDB (2010), p. 6.
90 Cf. AfDB (2016), p. 24.
91 Cf. ibid.
92 Cf. AfDB (2018), p. 13.
93 Cf. AfDB (2019), p. 3. Note: Percentage points of growth projected before the outbreak of COVID–19.

The recent price shock revealed the dichotomous economic structure of the African continent and its key economic drivers. While Africa's previous growth trajectory has primarily been driven by its largest commodity exporting countries, including Angola, Nigeria and Sudan, smaller, non-commodity exporting economies, such as Burkina Faso, Ivory Coast, Ethiopia, Ghana, Niger, Rwanda, Senegal, Tanzania and Uganda have now taken the lead, driving Africa's growth with economic growth rates ranging between 6-10%.[94] In the past years, resource-dependent economies experienced a tepid growth at around 2-4% due to the sharp decline of oil and the drop of commodity prices.[95] Due to the low degree of economic diversification and strong resource dependence, these countries are more vulnerable to price shocks than their non-resource-dependent counterparts in Eastern Africa.

The increased growth in non-resource dependent economies is underpinned by increasing domestic demand, favorable FDIs, increased regional trade, improved institutional systems, technological leapfrogging[96] and the emergence of new markets in the service sector.[97] Indeed, the service sector is becoming an important driver of growth in Africa and the continent's structural transformation, already accounting for one third of total formal employment.[98] Service-based firms successfully absorb low-skilled labor for various tasks along the service delivery chain while still contributing to higher productivity. Kenya is one example of service-led growth, with the service sector already contributing the highest proportion to the country's GDP growth. This is expected to continue as the country remains the leading regional hub for ICTs which is closely tied to the service sector.[99]

The continent is not only performing well with regards to economic figures, various social and governance issues are also being addressed, with encouraging prospects for the near future. For example, out of its 54 countries, 26 have achieved middle-income status, while 18 African countries have reached medium to high levels of human development, reflected in improved

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94 Cf. AfDB (2016), p. 24; AfDB (2019), pp. 6-8. See Appendix 4.
(Ivory Coast, Djibouti, Ethiopia, Mozambique, Rwanda and Tanzania were among the fastest-growing countries in the world in 2016 (AfDB (2016), p. 24).

95 In light of the COVID-19 pandemic, the oil price collapsed, driven by reduced global demand. In the month of March 2020, oil prices fell by approximately 50%, dramatically exacerbating the economic situation for the net oil exporters, which will suffer from liquidity issues, lost tax revenues and currency pressures.

96 In 2018, mobile technologies and services generated 8.6% of GDP in sub-Saharan Africa – a contribution that amounted to $144.1 billion of economic value added. The mobile ecosystem also supported almost 3.5 million jobs (directly and indirectly) (GSMA (2019), p. 13).

97 Cf. George et al. (2016), p. 377; AfDB (2018), pp. 8-9

98 Cf. ILO (2014), p. 12; AfDB (2016), p. 202.

99 Cf. AfDB (2016), p. 202.

education, health care and standards of living.[100] Since the beginning of the implementation of the goals of the Agenda 2063[101], which is the masterplan for turning the Pan-African Vision of "An integrated, prosperous and peaceful Africa"[102] into reality, the continent has improved considerably with regards to strengthening the rule of law, fostering accountability and transparency and fighting corruption. In addition, Africa has made steady progress in building capable states with inclusive political systems and robust institutions, resulting in free and fair elections.[103] In fact, in 2011, 18 countries have established democratic systems with multi-party systems, compared to four in 1991.[104] In 2016 and 2017, 26 African countries held national elections, enhancing peace-building and trust in institutions.[105]

African economies also face massive challenges.[106] Of the 187 countries ranked by the IMF based on GDP per capita, 26 African countries are ranked at the bottom 30, with Burundi, the Central African Republic, the Democratic Republic of the Congo, Eritrea and Niger ranked as the five poorest countries in the world.[107] While the proportion of those living in poverty has fallen from 56% in 1990 to 42% in 2012, the absolute number of extremely poor people, those who live on $1.90 a day or less, increased.[108] In 2015, more than half of the world's 736 million extremely poor lived in sub-Saharan Africa, and the number is expected to rise in this region. According to the Human Development Index (HDI),[109] the five least developed economies in the world are also located in Africa, including Niger, the Central African Republic, Chad, South Sudan and Burundi.[110] Furthermore, the lack of employment opportunities for the twelve

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100 Cf. AfDB (2016), p. 92.

101 The Agenda 2063 is a 50-year strategic framework with the main objective to guide Africa's development for the next half-century and to achieve the vision of "The Africa We Want". It is Africa's blueprint and master plan for transforming Africa into the global powerhouse of the future. It is the continent's strategic framework that aims at achieving its goal for inclusive and sustainable development and is a concrete manifestation of the Pan-African drive for unity, self-determination, freedom, progress and collective prosperity pursued under Pan-Africanism and the African Renaissance (African Union (2019)).

102 Mo Ibrahim Foundation (2019), p. 50.

103 For instance, the business climate in Kenya has improved considerably: The economy moved up 12 places to a ranking of 80 in the World Bank's 2018 Doing Business report (AfDB (2018), p. 150).

104 Cf. AfDB (2014), p. 17.

105 Cf. AfDB (2016), pp. 134-136.

106 Cf. George et al. (2016), p. 377.

107 Cf. IMF (2019).

108 Cf. AfDB (2018), p. 15.

109 The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and older and expected years of schooling for children of school entering age. The standard of living dimension is measured by the gross national income per capita (UNDP (2019a)).

110 Cf. UNDP (2019b), p. 326.

million youth (ages 15-24) that are entering the job market every year, creates another severe challenge for African economies. As a result of lacking job offers, young workers tend to join the informal economy. This vicious cycle further fuels the profusion of underdeveloped workforce. Hence, this steadily growing labor force of young workers, which is projected to rise from 705 million in 2018 to nearly 1 billion in 2030, creates both a great opportunity for Africa and the global economy, which is expecting significant labor shortages, but also presents a high risk for social upheaval and unrest if economic growth fails to stimulate job creation.[111]

Starting and growing a business in Africa is typically more difficult than in other parts of the world. Poor infrastructure, high transactional costs and corruption adversely affect entrepreneurial activity. According to the World Bank's ease of doing business ranking, out of 190 ranked countries 19 African countries are placed among the worst 30.[112] This means the regulatory environment is not very conducive to starting and operating a local firm. Yet, several new trends in recent years, especially the rapid penetration of the Internet, have been changing the African business landscape, surfacing new growth opportunities and thus increasingly raising the interest of corporate leaders, investors and entrepreneurs.[113]

The diversity of the African context is captured in Table 2, which outlines some of the human, economic and institutional development indicators in a selected set of countries.[114] For the remainder of the study, the focus will be particularly on sub-Saharan African economies. Sub-Saharan Africa is, geographically, the area of the continent of Africa that lies south of the Sahara. It contrasts with North Africa, the territories of which are part of the League of Arab states within the Arab world.[115] The United Nations Development Programme (UNDP) lists 46 of Africa's 54 countries as 'sub-Saharan', excluding Algeria, Djibouti, Egypt, Libya, Morocco, Somalia, Sudan, and Tunisia.[116] The next two subchapters frame these context peculiarities according to the two key characteristics of emerging markets: institutional voids and resource scarcity.

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111 Cf. AfDB (2019), pp. 16-18.
112 Cf. World Bank (2020a).
113 See Appendix 12.
114 See also Appendix 13.
115 In contrast, the World Bank includes the Arabic-speaking states of Mauritania and Sudan in sub-Saharan Africa, while the African Union's definition includes Sudan but instead excludes Mauritania. It is not just a question of physical geography, but also one of ethnocultural aspects (The Economist (2019)). Yet, this study follows the UNDP geo-scheme for Africa. See Appendix 5.
116 Cf. UNDP (2020).

Table 2: Human, Economic and Institutional Development in Ten Countries from Africa's Five Regions

Region and Country	Population[a]	GDP per capita[a]	GDP per capita growth (%)[a]	Openness (trade)[a]	Human dev. (rank)[b]	Ease of Doing Business (rank)[c]	Political rights[d]	Civil liberties[d]	Corruption (rank)[e]
North Africa									
Algeria	41.3	15,292.7	-0.2	56	0.754 (85)	157	6	5	35 (105)
Morocco	35.7	8,225.0	2.7	84	0.667 (123)	60	5	5	43 (73)
West Africa									
Ghana	28.8	4,501.9	5.8	74	0.592 (140)	114	1	2	41 (78)
Nigeria	190.9	5,887.2	-1.8	26	0.532 (157)	146	3		27 (144)
Central Africa									
Cameroon	24.05	3,722.4	0.9	41	0.556 (151)	166	6	6	25 (152)
Chad	14.8	1,945.3	-5.9	74	0404 (186)	181	7	6	19 (165)
East Africa									
Ethiopia	105	1,903.2	7.6	31	0.463 (173)	159	6	6	34 (114)
Kenya	49.7	3,292.4	2.3	37	0.590 (142)	61	4	4	27 (144)
Southern Africa									
Angola	29.8	6,657.9	-3.4	52	0.581 (147)	173	6	6	19 (165)
South Africa	56.7	13,526.2	0.1	58	0.699 (113)	82	4	2	43 (73)
Sub-Saharan Africa	1,061.1	3,837.9	-0.2	51	n.a.	n.a.	1-7	2-7	32
China	1,386.4	16,842.4	6.3	38	0.752 (86)	46	7	6	39 (87)
Germany	82.7	52,555.9	1.7	87	0.936 (5)	24	1	1	80 (11)
United States	325.1	59,927.9	1.6	27	0.924 (13)	8	2	1	71 (22)

[a] World Bank (2017). Population data are in millions; GDP per capita data are based on purchasing power parity; GDP per capita growth (%) GDP per capita growth rate; openness (trade) the sum of exports and imports of products and services as a share of GDP. https://data.worldbank.org/indicator.

[b] United Nations Human Development Program (2018) (2017 data). The Human Development Index is a composite index based on life expectancy, mean and expected years of schooling, and gross national income per capita measures. Here, "0" represents the lowest and "1" the highest value of human development. Ranks are in parentheses.

[c] World Bank (2018). Economies are ranked on their ease of doing business, from 1–190. A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm: http://www.doingbusiness.org/en/rankings

[d] Political Rights (2019). "1" represents the greatest degree and "7" represents the smallest degree of freedom in political rights. The index evaluates three categories: electoral process, political pluralism and participation, and the functioning of government: https://www.theglobaleconomy.com/rankings/political_rights/

[e] Transparency International (2018). The Corruption Perceptions Index - CPI. The 2018 CPI draws on 13 surveys and expert assessments to measure public sector corruption in 180 countries and territories, giving each a score from zero (highly corrupt) to 100 (very clean). Country ranks are in parentheses.

Source: Adapted from George (2016), p. 378.

2.3 Characteristics of Emerging Markets

2.3.1 Institutional Voids

One key feature of emerging markets is the persistence of institutional voids, which can be understood as the widespread lack of well-functioning institutions.[117] In developed economies, a range of specialized intermediaries provide the requisite information and contract enforcement mechanisms needed to efficiently conduct transactions.[118] Developing and emerging market economies, in contrast, often fall short of this and are marked by the dearth of established property rights, transparency, reliable legal systems and enabling intermediaries.[119] Enforceable property rights, for instance, are vital for a well-functioning real estate market as well as for the use of real estate as a guarantee for other financial transactions. Yet, such rights are either non-existent or not reliably enforced in many emerging markets.[120] Institutions in developed economies, on the other hand, provide the "rules of the game"[121] to which actors must "conform in order to receive legitimacy"[122]. Institutions consist of both "formal rules (constitutions, laws and property rights) and informal constraints (sanctions, taboos, customs, traditions and codes of conduct)", and together guide cognitive and behavioral activities in a social system.[123] Throughout history, human beings devised and established rules to create order and reduce uncertainty in exchange relationships. Together with the economic market institutions, they build the incentive structure of an economy, determining transaction and production costs and, hence, the profitability and feasibility of engaging in economic activity.[124]

Emerging market economies often lack the formal rules and routines, necessary for efficient economic exchange. For example, healthcare in India is a fragmented sector and the regulations of the industry are not rigorously defined by the local government. Introducing IT-based solutions, such as electronic health records, is challenging for tech startups, because they must often address regulatory and administrative shortcomings to create value for local clients.[125] Formal institutions in Africa are considered underdeveloped. The African context is predominated by informal rules, such as kinship ties and tribal networks, to ensure effective

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117 Cf. Mair & Martí (2009); Khanna & Palepu (2010); Webb et al. (2010); Mair et al. (2012).
118 Cf. Khanna & Palepu (2010), p. 14.
119 Cf. Mair et al. (2012), p. 821; Ault & Spicer (2014), p. 1823.
120 Cf. Khanna & Palepu (1997); De Soto (2003), p. 87.
121 North (1991), p. 98.
122 Scott (1995), p. 132.
123 North (1991), p. 97.
124 Cf. ibid.
125 Cf. Ahuja & Chan (2016), p. 3.

functioning.[126] Therefore, knowledge of the informal rules in the African context (e.g., tribal or ethnic systems and cultural norms) are vital to run local business operations.[127]

As a result of underdeveloped institutional systems, the incentives for entrepreneurial involvement in these settings are considered low. Individuals and organizations know that potential profits from entrepreneurship might not be protected in situations when business partners renege on their contractual agreement. In these environments, entrepreneurs cannot rely on institutional foundations, where courts can enforce contracts and where the prospect of legal sanctions can reduce the incentives to cheat.[128] Because these institutions are weak or absent, individuals cannot trust that agreements will be faithfully executed by the other party, as they might in developed markets, because such foundations are largely absent.[129] Institutional environments in emerging markets are apparently intricate for regular business operations, and thus can be considered even more difficult for innovation.

2.3.2 Resource Scarcity

Beyond that, emerging markets are characterized by extreme resource scarcity. Resource scarcity is not a uniform concept and comprises different themes. First, emerging market scholars often refer to the lack of consumer income to buy or use certain products or services. As a result, these severe income constraints prevalent in emerging market economies significantly limit the scope of new products and services that would be potentially viable there.[130]

Second, another type of resource scarcity is related to the constrained availability of strategic resources and capabilities.[131] From a resource-based view (RBV), firms achieve a sustained competitive advantage by applying firm-specific resources and capabilities that are valuable, rare, hard to imitate and organizationally embedded.[132] Furthermore, resources are necessary to produce certain goods or services. In developed economies, firms can easily access diverse resources and capabilities through well-functioning factor markets.[133] In developing and emerging market economies, firms cannot rely on a similar access to resources and capabilities

126 Cf. Zoogah (2008), p. 247.
127 Cf. Kamoche & Harvey (2006), p. 166.
128 Cf. Mair & Martí (2009), p. 429.
129 Cf. Knack (2001), p. 8.
130 Cf. Seelos & Mair (2007), pp. 52-53; Prahalad (2010); Sánchez & Ricart (2010); Kistruck et al. (2016).
131 Cf. Linna (2013), p. 3.
132 Cf. Barney (1991), pp. 106-108.
133 Cf. Peteraf (1993), p. 188.

relevant for ensuring a firm's business operations. Moreover, emerging markets are characterized by chronic shortage of resources and capabilities, which adversely affect production, transactions and consumption.[134] However, Africa has abundant natural (water, forest and soils), mineral (oil, gold, diamond and manganese) and human resources which can be used to improve a firm's performance.[135]

Research literature, yet argues, that these economies lack the resources urgently needed for innovating.[136] For example, superior human resources and managerial competencies are widely lacking in developing and emerging market economies because of the underdeveloped educational systems and the scarcity of training opportunities.[137] Especially, multinational firms have struggled with hiring management personnel or skilled workers, which is a major barrier to growth. Management capabilities, which are defined as the complex system of decision-making, controlling and defining strategic objectives and, which often come in the form of executive or managerial leadership, are in particular important in the growth stage of local business operations. The lack of these capabilities is oftentimes compounded by high rates of illiteracy, resulting from sparse public investments in education, while private schools are usually too expensive.[138]

Furthermore, the financial system is underdeveloped and, thus, access to financial resources is constrained. Especially, young firms face difficulties in accessing both the investment funding and working capital necessary to run business operations. Important financial intermediaries, such as venture capitalist, are widely missing, whereas banks require substantial amounts of collateral and charge high interest rates, creating unfavorable conditions for entrepreneurs. The business culture, thus, is often marked by financial survival, conservative financial management and hoarding capital.[139] Although any kind of entrepreneurship is characterized by severe resource constraints, and entrepreneurs often have to start their business with a minimum amount of resources, there are differences in the availability and reliability of resources between developed and emerging market economies.

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134 Cf. Torri (2010), p. 237; Linna (2013), p. 3.
135 Cf. Zoogah (2008), pp. 245-246.
136 Cf. Cunha et al. (2014), pp. 203-204.
137 Cf. McKinsey (2012).
138 Cf. Chliova & Ringov (2017), p. 48.
139 Cf. Dia (1996), pp. 155-168; Julian & Ofori-Dankwa (2013), p. 1317.

Technological resource constraints represent both the lack of technological infrastructure and the shortage of technical human resources.[140] Technological infrastructure resources, such as patents, advanced technical systems, and production facilities with high-tech machinery are widely absent or only in limited supply. Such technologies are limited or sparse in emerging market economies because of the underdeveloped manufacturing sector and the high implementation and maintenance costs.[141]

In sum, even if a solution might be viable from the demand side, its development and implementation could be constrained or derailed by the availability of supply side factors. An illustrative case is that of HealthLine, a telemedicine venture, whose scalability is constrained by the limited availability of physicians and other medical personnel to staff the health hotline.[142] Hence, the deficit of resources adversely affects the effectiveness of new solutions and eventually firms' growth prospects.[143] These various resource constraints combined with the institutional deficits suggest that the nature and process of innovation in emerging markets is fundamentally different from that in developed economies, in being more frugal, flexible and socially inclusive.[144] Subchapter 2.5 presents selected innovation concepts prevalent in the emerging market context, collectively labeled as constrained-based innovation.[145] The study parses the term "constraint-based innovation". First, it tries to understand 'innovation' separately and provides the foundational understanding of the term. Then, it contextualizes innovation in the constrained environment of emerging markets, by outlining the corresponding innovation concepts.

2.4 The Understanding of Innovation

2.4.1 The Origins of Innovation

Innovation has proven to play a vital role for sustaining economic growth and the competitiveness of nations, industries, and firms.[146] It is also regarded as essential for improving the society's standard of living.[147] Because of these vital effects of innovation, it is the engine for social and economic development, that has attracted large attention from researchers across

140 Cf. Ahuja & Chan (2016), p. 2.
141 Cf. Zoogah et al. (2015), p. 16.
142 Cf. Ivatury et al. (2009), p. 141.
143 Cf. Zoogah et al. (2015), p. 16.
144 Cf. Radjou et al. (2012).
145 Cf. Agarwal et al. (2017).
146 Cf. Bhatti & Ventresca (2013), p. 2; Fagerberg et al. (2013), p. 1; Chen et al. (2018), p. 1.
147 Cf. Gopalakrishnan & Damanpour (1997), p. 15; OECD (2005), p. 42.

various disciplines, such as economics, management, engineering, and marketing. This fascination with innovation, however, has resulted in a proliferation of definitions of innovation, creating ambiguity about how the term innovation can be understood.[148]

Providing an understanding of innovation is important to examine the phenomenon of interest in this study. Etymologically, the term 'innovation' is derived from the Latin words 'novus' (meaning new) and 'innovare' (meaning to make something new), underscoring the novelty aspect of the innovation concept.[149] From a historical perspective, the concept of innovation was originally inspired by the works of Joseph Schumpeter. In his seminal book *The Theory of Economic Development*, he determines that innovation, understood as the commercialization of a new idea or invention, is the source of economic growth in capitalist economies.[150]

According to his view, economic growth occurs through a process of creative destruction, where innovation disrupts the old industrial structure and creates a new one, inducing economic change "from within" the economic system.[151] It is the disturbance of the circular flow. This transformative process destroys dominant firms and products in favor of new business concepts and products, and thus contributes to economic growth and development. Assuming that inventions and entrepreneurial opportunities are abundant and available, Schumpeter stresses that the commercialization, this means the transformation of ideas into innovations, is the bottleneck. Schumpeter argues that the entrepreneur is the prime agent of this transformational process and economic change, as he breaks up the equilibrium state of the economy by establishing new combinations of factors ('innovation') to the market.[152] Based on this notion, he particularly distinguished between five types of innovation ("new combinations"): new products or a qualitative change in the existing product, new methods of production, the exploitation of new markets, new sources of supply for raw materials or other inputs and new ways to organize business (e.g., like the creation of a monopoly position).[153]

In Schumpeter's early theory, this ability to break with established practice and to introduce innovations was primarily linked to individual entrepreneurs. He states that the most significant innovations are not introduced by established firms, but by outsiders, by "new men" who set

148 Cf. Garcia & Calantone (2002), p. 112; Fagerberg (2013), p. 20.
149 Cf. Volkmann et al. (2010), p. 100.
150 Cf. Schumpeter (1934).
151 Cf. Schumpeter (1942), p. 83.
152 Cf. Schumpeter (1934), p. 65.
153 Cf. ibid, p. 98.

up "new firms".[154] Thus, he primarily focused on radical innovations implemented by small innovative firms, which represented a small fraction of founders (so-called Schumpeter "Mark I"), and which are not to be confused with business founders or self-employment, in general. Later in his career, Schumpeter also emphasized the role of innovation performed by large industrial firms, where the process of innovation had become institutionalized and routinized in R&D centers (Schumpeter "Mark II").[155]

Moreover, Schumpeter proposed three distinct stages that still serve as conceptual foundation for innovation scholars today. The first stage involves the technical discovery of new things or ways of doing things, which he labels 'invention'. The second stage marks the 'innovation' itself, understood as the successful commercialization of a new good or service based on a previous technical discovery or a novel combination of new and old knowledge. This stage is linked to the notion of "creative destruction". Because only through economic commercialization of new products and processes can new ideas and inventions destroy the dominant position of incumbent firms and, consequently, change the industrial structure substantially.[156] The third stage, 'imitation', describes the general adoption and diffusion of new products and processes to markets.[157]

A core idea in Schumpeter's understanding of innovation, that is gaining momentum in today's innovation discourse, is that, in its essence, innovation represents a "new combination" of existing resources, equipment, and knowledge. In his understanding the generation of new resource combinations involves creatively withdrawing resources from the uses they were originally intended for and putting them into new uses.[158] Hence, most innovations are not novel in themselves, rather they represent novel combinations of existing resources.[159] Recently, some researchers in the digital innovation and service innovation literature have drawn upon Schumpeter's central thought, suggesting that the nucleus of innovation in the digital age concerns recombining resources in novel ways or "carrying out of new combinations"[160]. This is referred to as neo-Schumpeterian understanding of innovation.[161] This combinatorial perspective also suggests that the scope for recombination is almost infinite, as distinct elements

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154 Cf. Schumpeter (1934), pp. 75-78.
155 Cf. Schumpeter (1942); Carlsson et al. (2013), p. 917; Fagerberg et al. (2013), p. 5.
156 Cf. Schumpeter (1934); Clausen (2009), p. 4.
157 Cf. Dosi (2013), p. 112.
158 Cf. Schumpeter (1928), p. 378.
159 Cf. Salter & Alexy (2014), pp. 29-30.
160 Schumpeter (1934), p. 66.
161 Cf. Lusch & Nambisan (2015), p. 156; Witell et al. (2017), p. 291; Goduscheit & Faullant (2018), p. 704.

can be combined in endless configurations to yield new and valuable products, processes and services.[162] Beyond that, a major combinatorial breakthrough can spur a series of related combinations. For example, the smartphone helped create a new market for thousands of small, innovative software applications, which represent novel configurations of resources.[163] Considering the new combinatorial potentials enabled through digital technology and in accordance with these recent conceptualizations of innovation, this study views all innovations as novel combinations of existing and new resources.

2.4.2 Definition of Innovation

The traditional understanding of innovation developed by Schumpeter has built the foundation for a vast number of definitions in the innovation literature and categories established by manuals for statistical measurement of innovation. For instance, the first and second edition of the Oslo Manual (1992/1997), which is the international reference guide for collecting and using data on innovation, used the technological product and process (TPP) definition of innovation with a focus on technological development of new products and new production techniques by manufacturing firms.[164] Yet, there has been a growing sense that the classical understanding of innovation as technological innovation is challenged and that much of innovation in less R&D-intensive industries, such as services, is not adequately captured by this traditional definition. In 2005, the Oslo Manual[165] expanded the definition to include organizational and marketing innovations (non-technological innovations), while the latest edition of the Oslo Manual, as of 2018, established the following definition for innovation in the business sector: "A business innovation is a new or improved product [good or service] or business process (or combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm."[166]

This definition includes the two key concepts of innovation: novelty and implementation.[167] Hence, the product (goods or services) or process must be 'new' (or significantly improved) to the market or the firm that applies it, and the innovation must have been 'implemented'. A new

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[162] Cf. Kogut & Zander (1992), p. 391.
[163] Cf. Salter & Alexy (2014), p. 30.
[164] Cf. OECD (1992); OECD (1997), pp. 8-9.
[165] Cf. OECD (2005), p. 47.
[166] OECD & Eurostat (2018), p. 20.
[167] Definitions of innovation can be found in Garcia & Calantone (2002), Baregheh et al. (2009) and Edwards-Schachter (2018).

or improved product is implemented when it is put into use or introduced on the market, otherwise it remains an invention.[168]

Furthermore, the Oslo Manual points out that 'innovation' can refer to either a process or an outcome. To avoid confusion, the manual uses the term "innovation activities" to denote to the process while the term 'innovation' refers to outcomes. The basic definition of innovation activities is as follows: "Innovation activities include all developmental, financial, and commercial activities undertaken by a firm that are intended to result in an innovation for the firm."[169]

The manual also points out that, with regards to regions outside of developed economies, research widely accepted that diffusion and incremental changes to innovation account for much of the innovation occurring in non-OECD economies.[170] In this vein van de Ven notes that, "As long as the idea is perceived as new to the people involved, it is an 'innovation' even though it may appear to others to be an 'imitation' of something that exists elsewhere"[171]. The relevance of perception in determining what innovation is, this means perceiving something as new in a specific context, is also substantiated by sociologists, who define innovation as "… an idea, practice, or object that the members of a social system perceive as new"[172]. Accordingly, once the innovation is in use, it can evoke a process of social change, by altering the structure and function of the social system.[173]

For the remainder of this study, innovation is understood as a novel combination of resources in generic terms. And more specifically, innovation signifies both the outcome and the process of innovation, whereas the process refers to the activities necessary to achieve a certain outcome, and the outcome represents a novel combination of resources, that is implemented into the market. Furthermore, the innovation needs only be new to the people of a social system and does not have to be universally new. In the next section, this study immerses into the innovations landscape in emerging markets and reviews the innovation concepts pertinent in these contexts. But before a distinction is made between the concepts of resource-based innovation and resource-constrained innovation.

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168 Cf. Garcia & Calantone (2002), p. 112; Popadiuk & Choo (2006), p. 303; OECD & Eurostat (2018), p. 20.
169 OECD & Eurostat (2018), p. 68.
170 Cf. OECD (2005), pp. 3-4.
171 van de Ven (1986), p. 592.
172 Rogers (2003), p. 36.
173 Cf. ibid, p. 6.

2.5 Constraint-based Innovation Approaches in Emerging Markets

Literature differentiates between two major paradigms of innovation. The first paradigm refers to resource-based innovation, which relies on resource availability and capability development.[174] This paradigm underscores the relevance of resource abundance for the innovation potential and the performance outcomes of a firm.[175] The underlying assumption is, at least implicitly, that firms have access to the necessary resources, which they (re)combine and, eventually, turn into innovations. As Prahalad & Mashelkar state: "Most innovation programs are built on the assumptions of affluence and abundance. The more, the better."[176] In other words, it is believed that innovation is something that can only occur when resources are thrown at the problem.[177] Resource constraints, on the other hand, are regarded as having a substantially inhibiting effect on innovation performance. This prevailing view in innovation management literature, namely that an adequate endowment with resources favors innovation success,[178] seems to be inadequate for the emerging market context, which is precisely defined by the widespread lack of resources.[179]

The second paradigm emphasizes the role of resource constraints for the emergence of innovation and relies on innovating with limited or scarce resources. This view argues that resource constraints can, in fact, drive creativity and, thus, foster innovation.[180] Proponents of this view, such as Gibbert et al. note that innovators being confronted with constraints are more likely to find creative resource combinations that would, otherwise, be concealed under a "glut of resources"[181]. Srinivas & Sutz note in their research on scarcity-innovations that scarcity conditions namely affect how problems are defined and solved.[182] Furthermore, Sirmon et al., argue that owning or having access to resources alone is insufficient in achieving and sustaining a competitive advantage, instead, they emphasize the key role of evaluating and managing available resources, especially the ability to effectively bundle and deploy them, to achieve a competitive outcome.[183] Furthermore, Penrose argues that each firm is unique in its

174 Cf. Wernerfelt (1984); Barney (1991).
175 Cf. Hewitt-Dundas (2006), p. 259; Gibbert et al. (2007), p. 15.
176 Prahalad & Mashelkar (2010), p. 133.
177 Cf. Linna (2013), p. 3.
178 Cf. Amabile (1996); Cooper et al. (2004), p. 58.
179 Cf. Prahalad (2010).
180 Cf. Baker & Nelson (2005); Gibbert et al. (2007); Linna (2013).
181 Gibbert et al. (2007), p. 16.
182 Cf. Srinivas & Sutz (2008).
183 Cf. Sirmon & Hitt (2003); Sirmon et al. (2008), p. 919.

idiosyncratic relation to its resource environment.[184] This means that each firm can interact with the external environment in different ways and discover valuable resources, that might be useless or substandard to another firm. Hence, entrepreneurs active in the emerging market context might reveal valuable resource combinations from an environment which appears to be highly constrained.[185] As mentioned above, emerging markets represent a unique context for innovating, characterized by institutional shortcomings and resource scarcity.[186] It is argued that they may innovate through using hidden assets, such as social capital and cultural knowledge, rather than purely physical assets.[187]

Researchers generally agree that innovating in highly constrained environments requires specific innovation approaches and capabilities.[188] Over the past two decades, there has been growing interest in innovation approaches conceived under conditions of scarcity with a focus on emerging market economies and the BoP.[189] A variety of innovation studies provides important first insights into how firms can achieve resource-constrained innovations for emerging markets in general. Particularly, literature on the BoP has identified ways to address the needs of resource-constrained people, often situated in rural environments, by providing simple products in industries,[190] such as hygiene and health,[191] food and agriculture[192] or telecommunications.[193]

Well-known innovation approaches of this particular genre of innovation include innovation at the BoP,[194] disruptive innovation,[195] frugal innovation,[196] jugaad,[197] cost innovation,[198] grassroots innovation,[199] Gandhian innovation[200] and reverse innovation[201]. These types of innovation are collectively referred to as resource-constrained or constraint-based innovation

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184 Cf. Penrose (1959), p. 75.
185 Cf. Baker & Nelson (2005), p. 332.
186 Cf. Bhatti (2012), p. 9.
187 Cf. Diomande (1990); Zoogah (2008), pp. 243-245.
188 Cf. Prahalad (2012); Ahuja & Chan (2016).
189 For a detailed overview of constraint-based innovation approaches see Agarwal et al. (2017) and Chen et al. (2018).
190 Cf. Winterhalter et al. (2017), p. 3.
191 Cf. Anderson & Markides (2007); Ahlstrom (2010).
192 Cf. London et al. (2010); Gold et al. (2013).
193 Cf. Seelos & Mair (2007); Foster & Heeks (2013); Wilson et al. (2014).
194 Cf. Prahalad (2005).
195 Cf. Christensen (1997).
196 Cf. Zeschky et al. (2011); Bhatti & Ventresca (2013).
197 Cf. Prahalad & Mashelkar (2010); Radjou et al. (2012).
198 Cf. Williamson (2010).
199 Cf. Gupta (2013a).
200 Cf. Prahalad & Mashelkar (2010).
201 Cf. Immelt et al. (2009); Sinha (2013).

approaches.[202] The next section delineates some of the above-mentioned and most prominent innovation concepts to provide an understanding of the nature of constraint-based innovation and to review identified innovation practices.

2.5.1 Innovation at the Bottom of the Pyramid

Innovation research in developing countries is intrinsically linked to the bottom of the pyramid (BoP) proposition.[203] Over a decade ago, Prahalad introduced the BoP term, referring to the 4 billion people who live on less than $2 a day, and framed this low-income segment as untapped business opportunity. The majority of this population segment resides in developing and emerging market economies. In his publication, he promoted the idea that firms could make "a fortune" and simultaneously lift communities from poverty by targeting poor and disenfranchised people at the BoP through novel solutions. These new products and services will scale considerably and, thus, exert a positive social and economic impact on those people living in severe subsistence conditions, if they are made available at affordable prices.[204] In response, scholars and practitioners have been emphasizing a more prominent role of business and innovation to bring about the social and economic development in the context of BoP environments.[205] Successful examples, such as Aravind Eye Hospitals in India, Bharti Airtel, Tata Nano and BRAC in Bangladesh have fueled enthusiasm for the creation of scalable solutions at the BoP even further.[206]

Multinational corporations (MNCs) were central to the initial BoP proposition as they were assumed to have the resources and capabilities to addressing the needs of the poor by providing high-quality and low-cost market solutions.[207] Nevertheless, the implementation of the BoP proposition has, in many cases, proven to be more challenging than originally expected. For example, such business models often struggle with the agency costs that arise between the MNC and local sales partners.[208] Hence, as large Western corporations, specialized in advanced innovation for high-tech products and business models, increasingly realize that profits at the BoP can be lower than expected and that successful BoP solutions may require substantial changes of existing business models, they have become more skeptical of innovation projects

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202 Cf. Sharma & Iyer (2012); Puri et al. (2015); Agarwal et al. (2017); Winterhalter et al. (2017), p. 3.
203 Cf. Prahalad (2005).
204 Cf. Prahalad (2010), pp. 8-11.
205 Cf. George et al. (2012); Bruton et al. (2013).
206 Cf. Prahalad (2010), p. 10.
207 Cf. ibid, pp. 5-7; Prahalad & Mashelkar (2010).
208 Cf. Kistruck et al. (2013).

targeting the BoP.[209] As a result, a number of business enterprises have departed from these markets or assigned the innovation projects to their corporate social responsibility (CSR) departments.

The original idea of the BoP proposition of viewing the poor as consumers that characterizes the first generation of BoP literature has been the subject of extensive critique. Scholars criticized that such framings present a romanticized view of the poor as conscious consumers and de-emphasize the critical role and responsibility of the state in reducing poverty and providing access to basic infrastructure.[210] As a result, the emerging literature on the topic has undergone certain reorientations. More recently, BoP studies have increasingly reframed the role of the poor from passive customers to active co-creators of innovation.[211] This "second generation" of BoP literature encourages MNCs to enter BoP markets by forming partnerships with local intermediaries (e.g., NGOs, local firms and community-based organizations). Because they are embedded in the local settings, they are viewed as having a better understanding of the local specificities[212] and are able to develop socially acceptable[213] and environmentally sustainable solutions[214]. This co-venturing approach would combine the capabilities and knowledge of MNCs with those of the local community, resulting in an "embedded innovation strategy", and which is based upon a "native innovation capability"[215].

Yet, a growing body of evidence suggests that most solutions for the BoP remain small, because local innovations fail to achieve large scale and, correspondingly, are unsuccessful to yield a large-scale social impact.[216] As a consequence, BoP scholars increasingly claim a refined examination of the mechanisms under which the BoP proposition can yield the desired outcomes envisioned by its proponents.[217] Previous writings on BoP innovation has mainly concentrated on innovation models performed by MNCs from developed countries, only little attention has been paid to alternative approaches and strategies of innovation, for example, offered by local entrepreneurs from emerging markets so far.[218] Accordingly, discussions on ways to serve the BoP have gradually expanded to acknowledge the key role of smaller

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209 Cf. Olsen & Boxenbaum (2009), p. 112; London et al. (2010), pp. 586-590.
210 Cf. Karnani (2007).
211 Cf. London & Hart (2004); Simanis et al. (2008).
212 Cf. London & Hart (2004); London et al. (2010); Viswanathan & Sridharan (2012).
213 Cf. Prahalad (2012).
214 Cf. Pansera & Sarkar (2016).
215 Simanis et al. (2008), p. 64.
216 Cf. London & Hart (2004); Kayser & Budinich (2015).
217 Cf. George et al. (2012); Kistruck et al. (2013).
218 Cf. Chliova & Ringov (2017).

entrepreneurial organizations[219] that may be able to develop affordable products and services but also empower local communities,[220] fill institutional voids[221] and promote more inclusive patterns of socio-economic development.[222]

2.5.2 Disruptive Innovation

The term disruptive innovation was coined by Bower and Christensen back in 1995.[223] It describes those kinds of innovations that create a market disruption, by introducing products with inferior performance on key attributes, but that perform on other attributes that new customers value, as for example lower costs or user-friendliness.[224] In line with Prahalad's work on BoP markets and the proposition of huge economic potential therein, Hart and Christensen later identified emerging markets as the ideal market for disruptive innovations,[225] because the relatively cheap and simple products or services cater to the need of underserved markets. Disruptive innovations typically take hold at the bottom of the market, meeting the same needs as high-market solutions in a simple and less expensive way. They are usually underrated at first and tend to be regarded as 'low-class'. But due to their low costs and other advantages, they move up the market quickly and eventually become more appealing than their sophisticated competitors.[226]

These products have the potential to disrupt the existing markets with their good-enough offerings, which may have a lower performance but provide valuable features at a lower price to attract the price-sensitive segments, such as the BoP.[227] With a strong focus on affordability and acceptability, these innovations might also have lower gross margins and smaller target segments, but gradually have the potential to increase revenue by developing an altogether new market.[228]

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219 Cf. Kolk et al. (2014); Pansera & Sarkar (2016).
220 Cf. Khavul & Bruton (2013).
221 Cf. Mair & Martí (2009); Mair et al. (2012).
222 Cf. Papaioannou (2014).
223 Cf. Bower & Christensen (1995).
224 Cf. Christensen (1997).
225 Cf. Hart & Christensen (2002), p. 52; Christensen et al. (2006).
226 Cf. Christensen (2013), pp. xv-xvi.
227 Cf. Govindarajan & Kopalle (2006).
228 Cf. Ray & Ray (2011).

2.5.3 Frugal Innovation

Researchers consider frugal innovation to be the most disruptive type of all constraint-based innovations as it enables unprecedented applications at a low cost, specifically developed for customers located in resource-constrained environments in emerging markets.[229] Related terms to frugal innovation are Gandhian innovation[230] and jugaad innovation[231]. These two terms are linked to the Indian context in which many frugal innovations have been developed.

Frugal innovation applies a clean-slate approach of building affordable solutions from scratch for specific applications in resource-constrained environment, that respond to limitations as posed through scarcity in financial, material or institutional resources.[232] Affordability, availability, accessibility and creating awareness are the guiding principles[233] along the product development process of frugal innovations to specifically design solutions for low-income market segments.[234] Through consciously minimizing the use of raw material, frugal innovations also have environmental sustainability and supply chain benefits, which hold important implications for green product development in developed markets.[235] It is a structured bottom-up approach to innovation,[236] one that follows certain process steps and product management methodologies, contrasting with top-down, sophisticated, R&D-led development processes followed in the Western world.[237] Although existing technologies often build the base for frugal innovations, they typically require a new product architecture that enables entirely new functions at lower costs than existing solutions.[238]

Because of the new product architecture, frugal innovations are often quite disruptive. For example, by making a stationary product portable, a frugal innovation may reach an entirely new customer group.[239] Another well-known example[240] of frugal innovation is the mobile

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229 Cf. Rao (2013); Wan et al. (2015); Winterhalter et al. (2017).
230 Cf. Prahalad & Mashelkar (2010).
231 Cf. Radjou et al. (2012). Note: The Hindi word ‘jugaad’ signifies ‘workaround’, improvisation or “innovative fix” (Agarwal (2016), p. 54).
232 Cf. Zeschky et al. (2011); Bhatti (2012); Bound & Thornton (2012).
233 Cf. Prahalad (2012); Winterhalter et al. (2017).
234 Cf. Agarwal & Brem (2012).
235 Cf. The Economist (2010); Sharma & Iyer (2012).
236 Cf. Gupta (2012).
237 Cf. Bhatti (2012).
238 Cf. Zeschky et al. (2014).
239 Cf. Bhatti (2012); Zeschky et al. (2014).
240 Further examples of frugal innovations include the Tata Nano, the Sakshat $35 web notebook, the Hrudayalaya Heart Hospital, Discovery Health, Ushahidi and new business models in such activities as microfinance, rural electrification, crowd sourcing through mobile telephony, and health insurance (George et al. (2012); Bhatti & Ventresca (2013)).

phone-based microfinance service M-Pesa.[241] This short messaging system (SMS)-based microfinance solution brought banking to people, who previously had no access to it in the African continent, by leveraging existing mobile phone technology and infrastructure.[242] This technologically simple solution enables people in remote areas to get access to financial transaction services by just sending text messages via the global system for mobile communication (GSM) – an entirely new function or application that had not been available before.[243] Recently, scholars have increasingly highlighted the enabling role of IT in the development of frugal innovation.[244]

2.5.4 Bricolage

Bricolage can be defined as "making do by applying combinations of the resources whatever at hand to new problems and opportunities"[245]. The notion of bricolage was originally introduced by the French anthropologist Claude Lévi-Strauss to describe a particular mode in which human actors view and relate to their environment.[246] Lévi-Strauss thereby contrasted bricoleurs with engineers. He stated that engineers typically first determine the desired solution and then go out to find resources that match the predefined criteria, whereas bricoleurs take a different path, they start with the resources at hand and then explore ways towards finding a solution. The latter use resources with which they are intimately familiar and have at hand as means of finding solutions to problems,[247] which enables them to exploit physical, social or institutional inputs, factors that others reject or ignore. Bricoleurs have the capabilities to "make do" with cheap and free resources others regard to be useless or not state of the art, and to recombine them for new purposes.[248] A major practice that is associated with frugal innovation involves redesigning products and processes to cut out avoidable costs.

The bricolage concept indicates the activities and practices of entrepreneurs who create new ventures out of nothing.[249] The underlying argument is that under conditions of scarcity, the human mind is stimulated to develop novel ideas and recombine knowledge frameworks and

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241 Cf. Zeschky et al. (2014).
242 Cf. Graham (2010).
243 Cf. Foster & Heeks (2013).
244 Cf. Ahuja & Chan (2014); Barrett et al. (2015); Ahuja & Chan (2016); Agarwal et al. (2017).
245 Baker & Nelson (2005), p. 331.
246 Cf. Lévi-Strauss (1966).
247 Cf. Baker (2007).
248 Cf. Baker & Nelson (2005).
249 Cf. Duymedjian & Rüling (2010).

bypass constraints that constitute bottlenecks.[250] Bricolage is also related to the concept of improvisation[251], which is a tactic to mobilize resources through an ability to convert material or insights into novel combinations.[252] The bricolage concept originates from technology and product innovation with focus on developed markets but has recently been applied to the emerging market context, where the dearth of resources has been found to be even more severe than in Western economies.[253]

2.5.5 Business Model Innovation

More recently, research on business model innovation has gained increased attention in the emerging market literature. Scholars have proposed that innovations for low-income, resource-constrained communities increasingly rely on the emergence of new business models, rather than on radical changes in technologies.[254] For example, Prahalad suggests that in the context of developing economies there needs to be a shift in the perspective from a product-centric approach to business model innovation.[255] A business model depicts "… the rationale of how an organization creates, delivers, and captures value."[256] The term business model innovation may refer either to the design of a new business model for newly formed organizations, which represents an entrepreneurial act, or the reconfiguration of existing business models, which implies reconfiguring organizational resources in an existing business model.[257]

The business model can be divided into three core components: value creation, value capture and value proposition.[258] Value creation, thereby, involves all activities a firm performs to develop value and deliver this value to the customer and other stakeholders. It comprises activities, such as R&D, production, marketing and sales,[259] and, thus, includes all "processes, capabilities, resources and channels through which an offering is created and delivered to the customer"[260]. Value capturing refers to the revenue model and defines how a firm appropriates

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250 Cf. Hewitt-Dundas (2006), p. 273; Keupp & Gassmann (2013), p. 1465.
251 Cf. Witell et al. (2017).
252 Cf. Weick (1993).
253 Cf. Linna (2013).
254 Cf. George et al. (2012); Prahalad (2012); Chliova & Ringov (2017); Winterhalter et al. (2017).
255 Cf. Prahalad (2012).
256 Cf. Osterwalder & Pigneur (2010), p. 14.
257 Cf. Massa & Tucci (2014), p. 424.
258 Cf. Tongur & Engwall (2014), p. 527.
259 Cf. Shafer et al. (2005).
260 Winterhalter et al. (2017), p. 4.

some of the total value created.[261] Finally, the value proposition describes the value a firm's product or service creates and for what customer segment.[262]

Scholars investigating new business models in emerging markets have found that these business models either represent low-cost replications of established business models targeting developed markets or entirely new business models, which specifically create value for customers situated in low-income environments.[263] One successful example of a low-cost business model embodies the Aravind Eye Hospitals, which adopted a "McDonald's business approach" reaching a scale that allows them to conduct as many as 60% of the number of eye surgeries that the UK's National Health Service conducts each year, but at a fraction of the cost.[264] Reseachers argue that the main lever for frugal business models lies in the firms' R&D and in how efficiently they organize their value creation activities to achieve substantial cost reductions.[265]

Others accentuate the relevance of strong value propositions in the context of emerging markets. For example, Winterhalter et al. investigated business models for frugal innovation in the medical device sector in India and found that innovating firms need to create multiple value propositions at the same time to gain legitimacy.[266] Similarly, others suggest that business models in resource-constrained environments not only need to create value for the individual customer, but also for firms, people and the social environment.[267] In sum, research on business models adopts a more comprehensive perspective on the development of new products and services by pointing to different activity areas necessary to achieve a certain value proposition.

2.5.6 Service Innovation

Service innovation research in emerging markets is still at an early stage. Yet, more recently few studies have begun to unearth the specificities and differences in the nature of service innovation processes in emerging markets.[268] For instance, Alam compared the implementation of formalized NSD models and the underlying innovation practices among financial service

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261 Cf. Chesbrough (2002); Teece (2010).
262 Cf. Tongur & Engwall (2014).
263 Cf. Sánchez & Ricart (2010); Chliova & Ringov (2017).
264 Cf. Rosenberg (2013).
265 Cf. Winterhalter et al. (2017).
266 Cf. ibid.
267 Cf. Seelos & Mair (2007); London et al. (2010).
268 Cf. Alam (2007); Viswanathan & Sridharan (2012).

firms in the USA and in India, and found significant cross-national differences.[269] Notably, firms paid attention to different process stages. The authors explain that the differences in the interaction between customers and front-line personnel in both economies explain the variance of attention on different process stages. In another empirical study, the launch of a new mobile money service in Kenya is examined, based on five phases NSD process model: value creation, value delivery, value capture, value defense and value sustainability.[270] Furthermore, Anand et al. studied four cases of service innovation in the Indian insurance industry and identified seven context-specific service innovation processes: demystification, technologization, bundlization, indigenization, retailization, commoditization and segmentation.[271] They argue that these seven processes serve as generic responses to three issues firms typically face in the emerging market context: management of meaning and values, accessibility and affordability.[272] Similarly, Srivastava et al. shift the attention from the stage-based models to examining the value creation process of sustainable telemedicine healthcare service delivery models for the rural population in India.[273] Adopting a service-centric view, they focus on value-creating resource configurations, consisting of three interactional resources (knowledge, technology and institutions), to deliver this digitally enabled service, which is affordable and accessible for the end users.[274] They underline that the anatomy of resource configurations changes across the three distinct stages of service innovation evolution. These empirical studies provide evidence that the service innovation process in emerging markets differs from that in more developed countries and that innovating with digital artifacts in resource constrained environments probably requires a different approach than provided by the research concepts presented above. Finally, these studies stress to shift away from a product-centric perspective in examining service innovation in constrained environments.

2.6 Summarizing Thoughts and Criticism

Constraint-based innovations have in common that they are low-cost and easy-to-use solutions tailored to the needs of resource-constrained customers. Other scholars state that products targeting emerging markets need to be affordable, accessible, acceptable and available ("the Four As") to become viable solutions in resource scarce environments.[275] Similarly, a recent

[269] Cf. Alam (2007), p. 49.
[270] Cf. Wooder & Baker (2012), pp. 15-16.
[271] Anand & Monin (2013), p. 41.
[272] Cf. ibid.
[273] Cf. Srivastava & Shainesh (2015), p. 245.
[274] Cf. ibid, p. 263.
[275] Cf. Prahalad (2012).

comparison and consolidation of recurrent features across these various constraint-based innovations has revealed that products targeting emerging markets need to fulfill two major product requirements, namely: 'cost-effectiveness' and 'ease-of-use'.[276] It is explained that the low income of the target customers requires products to be cost-effective and low-priced, but still of high quality. In addition, new products need to be easy to use mainly due to the high levels of illiteracy.[277] While there seems to be agreement about the key outcome variables of constraint-based innovation, much less is known about the process and innovation activities necessary to achieve these product features.

Furthermore, prior research on innovation in emerging markets appears to have extensively focused on new product development strategies, overlooking the growing relevance of digital technology and the emergence of service innovation.[278] Indeed, comparing across the various innovation approaches and processes reveals that the emphasis of the research has so far been on the idea generation, the conceptualization and the potential exploitation of physical product innovation, largely neglecting the role of services coupled with the transformational potential of ICTs.[279] More recently, scholars have claimed that further research in the direction of understanding and analyzing the influence of new technological advancements, such as the Internet, mobile telecommunications and web 2.0 on the innovation process, is crucial. They claim a special focus on the service industry, given its dependence on IT.[280] Digital technology has transformational capabilities to improve the accessibility, costs, user engagement levels and adoption of innovations in these markets. Due to this product-centered thinking, research mostly concentrated on studying corporate firms and their solutions coming from sectors, such as automotive, industrial manufacturing, telecom, electronics and healthcare.[281] The Indian automotive industry and the case of the Tata Nano are the most favorable studies.[282]

This severe gap in the understanding of service innovation in emerging markets is unfortunate as it might entail new strategies of how to develop and manage new services more efficiently and effectively. As already seen in developed markets, there is a disruptive potential of digitally enabled service innovation, as demonstrated by the illustrative cases of UBER, Airbnb,

276 Cf. Agarwal et al. (2017).
277 Cf. Agarwal (2016), p. 67.
278 Cf. Lusch & Nambisan (2015).
279 Cf. Agarwal et al. (2017).
280 Cf. Barrett et al. (2015), p. 136; Agarwal et al. (2017)
281 Cf. Agarwal et al. (2017), p. 7.
282 Cf. Zoogah et al. (2015); George et al. (2016).

Facebook, Google or Netflix, that facilitated and enriched social life drastically.[283] Existing literature on innovation in emerging markets, yet, addresses this new phenomenon only in a fragmented way, largely ignoring theoretical developments related to service innovation and the expanding role of IT as examined in developed economies.[284]

A growing number of tech entrepreneurs in emerging markets is leveraging emergent technologies to explore new ways to deliver value to the local society.[285] For instance, tech startups in Africa are 'hacking' existing infrastructure gaps by leveraging digital technology, providing Africans with access to new goods and services (e.g., mobile applications for activities ranging from private security in Ghana to monitoring patients in Zimbabwe).[286] These new paths of value creation may critically impact a country's socio-economic development. So far, only little is known about the processes and activities, more specifically, about how these tech entrepreneurs develop and implement digitally enabled service innovation in institutionally deficient and resource scarce environments to create value for society.

In sum, the theoretical discourse on innovation strategies and practices in emerging markets appears to be linked to the past and is still synonymous to a sole focus on new products.[287] Hence, these existing models of constraint-based innovation are based on a goods-dominant (G-D) logic, in which a firm's manufactured good is the source of value creation.[288] Capturing these considerations, coupled with the transformational capabilities of IT, suggests the need for a better understanding of digitally enabled service innovation in the context of emerging markets. This is important to gain a better understanding of the potential impact of IT capabilities in these environments and of how people experience and innovate with service innovation under conditions of scarcity. Meanwhile, research in developed markets has provided further nuance to the understanding of service innovation and the role of digital technology by applying a service-centered perspective to service innovation, which will be introduced in the next chapter.

283 Cf. Lusch & Nambisan (2015).
284 Cf. Vargo & Lusch (2004); Vargo & Lusch (2006); Vargo & Lusch (2008); Ordanini & Parasuraman (2011); Lusch & Nambisan (2015); Goduscheit & Faullant (2018).
285 Cf. Pansera & Sarkar (2016).
286 Cf. George et al. (2016).
287 Cf. Sawhney et al. (2006), p. 75; Barrett et al. (2015).
288 Cf. Barrett et al. (2015); Agarwal et al. (2017).

3 ADOPTING THE S-D LOGIC AS A RESEARCH PERSPECTIVE

This chapter shifts focus to the S-D logic (3.1), embeds and defines the term service innovation (3.2) and explores the core dimensions of service innovation (3.3). Special attention is also paid to the technological dimension of service innovation (3.4). The remainder of this chapter sheds light on formalized and non-formalized service development approaches to describe practices of how to develop and implement novel services successfully (3.5). This chapter terminates with summarizing thoughts on service innovation research and the formulation of the overarching research question (3.6).

3.1 Principles of S-D Logic

In the recent years, service and marketing scholars have introduced a service-centered approach to value creation, broadening the service innovation research to encompass new logics of value creation, largely triggered by the diffusion of ICTs. Prior research underscored the relevance of dominant mental models or institutional logics[289] when individuals assess new opportunities and associated payoffs.[290] For a long time, the dominant mental model that shaped how innovation actors made decisions and pursued actions has been the G-D logic.[291] As above-mentioned, the research on innovation in emerging markets is largely conceptualized through a goods-centered perspective, where the major focus of innovation is directed on the development and provision of new tangible products to the underserved segments of the population, and where services are viewed as being an alternative of a product. Hence, the produced and delivered goods are viewed as the major source of value creation, what reflects a G-D logic of innovation.

This G-D perspective has its roots in the classic economic doctrine as suggested by Smith[292], which focuses on the surplus production of tangible goods that could be exchanged for national wealth. Resulting from this push-based philosophy, the G-D logic conceptualizes value creation as the production and distribution of tangible goods in the market, usually resulting in an exchange of goods and money. The G-D logic also views producers and consumers as distinct

289 Cf. Friedland & Alford (1991); Lounsbury & Crumley (2007).
290 Cf. North (1994), p. 362.
291 Cf. Lusch & Nambisan (2015), p. 156.
292 Cf. Smith (1904).

entities with divergent roles in the value creation process.[293] Here, the customer is seen as a passive recipient of value, whereas value creation is often viewed "as a series of activities performed by the firm"[294]. This view of natural or manufactured physical products as the basic unit of economic exchange was appropriate when Western societies entered the Industrial Age and the primary focus of interest in research was on manufacturing.[295]

In contrast, in the S-D logic the roles of producer and consumer in the value creation process are not distinct but intertwined.[296] The focus here is on understanding the needs and requirements of the service consumer and the offerings of the service producer who aims at creating something beneficial for the customer. This pull-based philosophy adopts a user-centric perspective, where value is created in collaboration with the customer through mutual interactions.[297]

Furthermore, the S-D logic views what a firm does not primarily as the production and provision of physical goods but rather as the "exchange of service"[298].[299] This view is based on the fundamental idea of the early economist Frédéric Bastiat who argued that the foundation of economic science are, on the one hand, people who have certain 'wants' and seek for 'satisfaction', and, on the other, "the efforts of others who have the skills and competencies to fulfill those 'wants'"[300]. In this sense, value was regarded as the "… comparative appreciation of reciprocal skills or services that are exchanged to obtain utility; value [means] 'value in use'"[301], as Vargo & Lusch state. Consequently, the S-D logic directs attention at the process of serving rather than at producing and providing a tangible product.[302] The S-D logic also holds the premise that value is interactively co-created with the customer, who subjectively and phenomenologically determines the value, when using the service.[303]

Furthermore, the S-D logic also reconceptualizes the concept of resources by differentiating between operand and operant resources. It considers operant resources, which represent the

293 Cf. Prahalad & Ramaswamy (2004a), p. 6; Vargo & Lusch (2004), pp. 10-11.
294 Vargo et al. (2008), p. 146.
295 Cf. Vargo & Lusch (2004), p. 6.
296 Cf. ibid, p. 11.
297 Cf. Lusch & Nambisan (2015), p. 159.
298 Vargo & Lusch (2008), p. 3.
299 Cf. Lusch & Nambisan (2015), p. 156.
300 Bastiat (1860), p. 40.
301 Vargo & Lusch (2004), p. 7.
302 Cf. Lusch & Nambisan (2015), p. 156.
303 Cf. Edvardsson et al. (2011).

physical and mental skills of individuals, as most important resources for value creation.[304] This stands in contrast to the G-D logic which is focused on the exchange and exploitation of static, tangible operand resources (e.g., raw materials). According to S-D logic, operant resources (e.g., knowledge and skills) are more valuable because they are able to act on operand resources to create value. This concentration on intangible resources in the S-D logic framework is grounded in the RBV,[305] more specifically in the competence-based perspective, which illustrates that knowledge and skills are the basis for building competitive advantage.[306] It is namely argued that a firm needs to possess specific competences in order to exploit its resources in a way to achieve its strategic goals.[307] Consequently, competences only encompass those activities which are intentionally executed to achieve a determined objective.[308] In the S-D logic, the shift to operant resources emphasizes the fundamental role of intangible resources for NSD. Overall, moving to S-D logic requires a shift in mindset of how value is created.[309] The next section will provide the S-D logic-based definition and further theorization of service innovation.

3.2 Definition of Service Innovation

Academic discourse on service innovation is still at an early stage and has not yet reached a consensus.[310] According to Coombs & Miles, service innovation studies have employed three different perspectives to conceptualize and analyze service innovation.[311] First, the assimilation perspective de-emphasizes the differences between product and service innovation and adopts methods of NPD to NSD.[312] In contrast, the demarcation perspective views service innovation as a special case of innovation and as explicitly different in nature and character from product innovation, in often being less formally organized, more incremental and continuous.[313] This view suggests that the prevailing theories of product innovation that follow a technological trajectory do not adequately explain service development in service organizations.[314] More recently, a novel, third perspective emerged, building on the S-D logic to value creation,

304 Cf. Lusch & Nambisan (2015), p. 159.
305 Cf. Vargo & Lusch (2006), p. 54; Roth (2015), p. 134.
306 Cf. Wernerfelt (1984); Barney (1991).
307 Cf. Freiling (2004), p. 29.
308 Cf. Sanchez et al. (1996), p. 8.
309 Cf. Roth (2015), p. 132.
310 Cf. Flikkema et al. (2007), p. 541.
311 Cf. Coombs & Miles (2000), pp. 85-86.
312 E.g., Nijssen et al. (2006).
313 E.g., Fitzsimmons & Fitzsimmons (2000).
314 Cf. Witell et al. (2016).

criticizing the aforementioned conflicting perspectives and proposing an integrative perspective that is broad enough to encompass both service and product innovation.[315]

This latter view takes into account that the phenomenon of service innovation has in the meantime grown beyond the service industry and has also increasingly become an equally vital phenomenon in the manufacturing sector. Traditional producers are bringing new product-service offerings to the market and engage in efforts to continuously extend their service portfolio to sustain their competitive advantage. For example, Rolls Royce developed a holistic product-service system in which they produced and retained ownership of the engines and offered to customers a managed service based upon a new business model denoted as "power by the hour".[316] As services often involve some form of product or artifact to provide a holistic value proposition, some scholars argue that distinctions between products and services are no longer worthwhile.[317]

From this integrative perspective, goods and services are not alternative forms of products. Rather, the goods (tangible resources) are the tools or distribution mechanisms that aid directing service provision. The focus is on specialized competences, such as knowledge and skills (intangible resources) that are applied through deeds, processes and performances to create a benefit for another entity.[318] Service, then, represents the general and universal case of the exchange process and is to be seen as the point of departure for value creation.[319] This transcending, integrative perspective, which is based upon a service-centered worldview, provides a multidimensional view of innovation. This also reflects a neo-Schumpeterian understanding of service innovation, emphasizing that economic development is driven by the introduction of new resource combinations, that are economically more viable than existing solutions.[320]

Departing from this integrative view, service innovation can be defined as "the rebundling of diverse resources (both tangible and intangible) that create novel resources that are beneficial (i.e., value experiencing) … to some actors in a given context".[321] This definition stresses that creating value for another actor (e.g., the customer) is the key goal of developing and offering

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315 Cf. Lusch & Nambisan (2015).
316 Cf. Neely (2008), p. 104.
317 Cf. Gustafsson & Johnson (2003), p. 7; Bryson et al. (2013).
318 Cf. Vargo & Lusch (2004), p. 2.
319 Cf. Lusch & Nambisan (2015), p. 159.
320 Cf. Drejer (2004); Witell et al. (2016), p. 2864.
321 Lusch & Nambisan (2015), p. 161.

a new service. Value creation thereby is a process through which the user becomes better off in some respect[322] or which increases the customer's wellbeing.[323] Enhancing the conditions of a customer may, for instance, refer to the user's goods[324], physical[325] or psychological[326] condition. In addition, the definition emphasizes that value creation is a context-specific phenomenon, which depends on multiple contingencies given in a societal setup. It seems that this aspect is particularly important for the context of this study, as the distinct conditions prevalent in emerging market economies are expected to have important implications for the process of service innovation and its value proposition. As the purpose of this study is to examine practices and competences related to the development and implementation of a digital service innovation, that creates value for the local customer (the beneficiary) in the special context of emerging markets, this broadened definition of service innovation appears appropriate for the remainder of this study.

3.3 Dimensions of Service Innovation

For operationalizing service innovation, many scholars[327] organize their conceptualization and research around den Hertog's four core dimensions: service concept, customer experience, service delivery system and technology (Figure 2).[328] The service concept builds the core of the service because it involves the discrete value proposition in terms of what is delivered to the customer.[329] Many new service concepts are combinatory in nature. This implies that they combine elements or functions of services that exist separately or as part of other services in a new combination or configuration that is valuable to the customer. One example is the bundled offering of telecom providers that integrate various services, such as telephone, broadband access and TV.[330]

Customer interface innovation refers to new ways of interacting with the customer and the integration of new interfaces through which customers can experience the new service offerings

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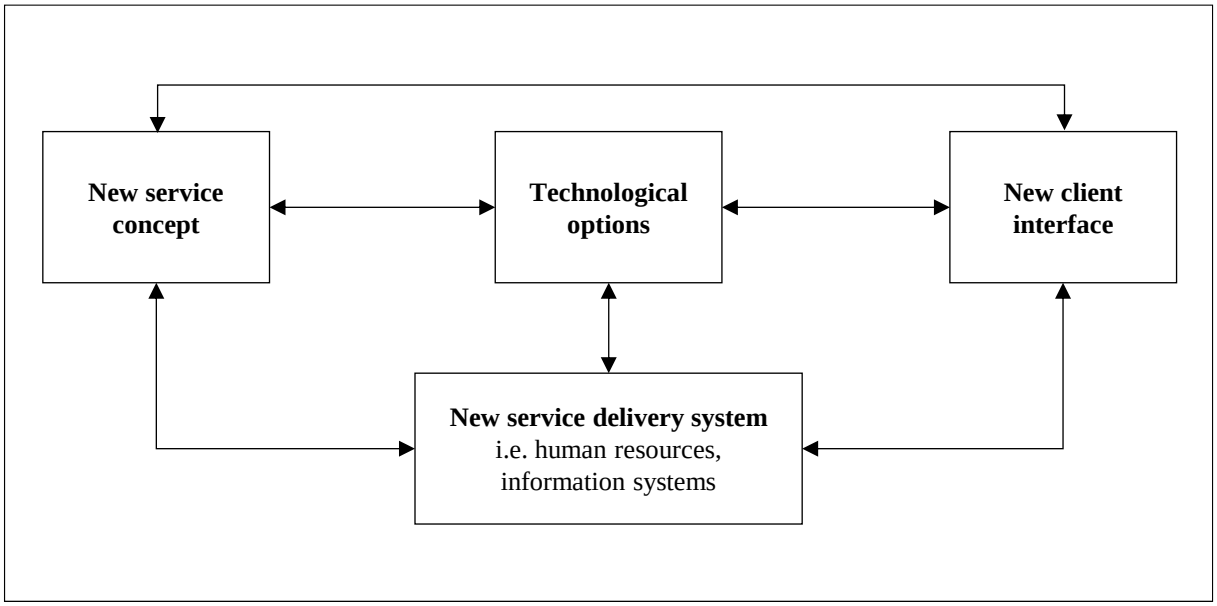
322 Cf. Grönroos (2008), p. 303.
323 Cf. Vargo et al. (2008), p. 150.
324 E.g., The producer works directly on goods owned by the user by transporting, cleaning, repairing or otherwise transforming them (OECD & Eurostat (2018), p. 53).
325 E.g., The producer transports a person or provides accommodation, medical or surgical treatments, changes the appearance of their hair, etc. (ibid).
326 E.g., The producer provides education, information, advice, entertainment, experience or similar services, potentially but not necessarily in a 'face-to-face' manner. These services may be digitally delivered (ibid).
327 Cf. Barrett et al. (2015), p. 138; Troilo et al. (2017), p. 619; Goduscheit & Faullant (2018), p. 704.
328 Cf. den Hertog (2000), p. 494.
329 Cf. Frei (2008), p. 72.
330 Cf. den Hertog et al. (2010), p. 494.

Figure 2: Four-dimensional Model of Service Innovation



Source: Reprinted from den Hertog (2000), p. 495.

in a different way. Mostly, innovation in this dimension is associated with variations on the implementation of 'self-service solutions'. The various generations of digital money and electronic banking ranging from the introduction of ATMs to the use of mobile phones in combination with cloud computing, data analytics, encryption and storage are examples of an innovation where the "customer-interface dimension" is dominantly present.[331] Financial transaction, such as payments, transfers and receipts, do not have to occur in the physical world anymore, e.g. through interactions with the banking personnel, but are shifted to the digital world.

Service delivery innovation primarily describes changes in the way employees perform their work in delivering services.[332] A new form of service delivery often requires changes in the organizational structure and other human resource management skills, and thus involves changes of the service system.[333]

In addition to personnel and organizational structures, technology has been regarded as a key resource and an enabler for service innovation. In these traditional approaches, ICTs are conceptualized as technological instruments in the service delivery process, which enhance the productivity and efficiency of service firms.[334] Today, digital technology is increasingly

331 Cf. den Hertog et al. (2010), p. 494.
332 Cf. Miles (2008), p. 122.
333 Cf. den Hertog et al. (2010), p. 495.
334 Cf. Barras (1990), pp. 216-218.

embedded in the very core of the products, services and operations of many companies from different sectors. Everyday tangible products, such as TVs, watches and cars now have embedded software-based digital capabilities.[335] Theorists, thus, stress that digital technology has a fundamental and transformative role as it allows new (re)combinations of digital and physical components to produce new solutions.[336] The rapid diffusion of mobile computing technologies, especially the Apple and Android mobile operating systems, social media platforms and cloud computing services, continuously unveils new potentials for innovation. Bouwman & Fielt stress that the technological advancements in ICTs have been key enablers to numerous service innovation, that would otherwise be not available.[337] For example, the interplay of telemetry, sensors, the Internet, mobile networks and computing have made it possible to offer new services (or resource combinations) in the transportation industry. The fundamentals of urban mobility are changing rapidly. Uber and Lyft are becoming ubiquitous around the world and new modes of mobility, like carsharing (e.g., Car2Go) and scooters, are on the rise. The conversation is increasingly trending towards mobility as a service, in which access to vehicles largely replaces ownership. As a result, the pervasive adoption of innovations with digital technologies are radically changing the nature of services.[338]

Overall, research around these four dimensions of service innovation acknowledges that innovation can refer to every single dimension or a combination of them, depending on the nature of the individual service, the degree of change and novelty introduced.[339] Sometimes, innovation in one dimension may also trigger changes in other dimensions within and across firms in a sector. One prominent example is the diffusion of video-recording equipment, which allows individuals to watch movies in their homes instead of going to a movie theater (service concept and client interface). But this change required movie distributors to utilize new service delivery media (e.g., VHS tapes, DVDs) provided through new delivery channels, such as video stores or online streaming services (service delivery system and technology).[340] It is obvious that ICTs have a fundamental and transformative role as resources in service innovation.[341] These dramatic shifts suggest new ways of understanding the interplay of digital technology and service to develop new knowledge about digitally enabled service innovation in emerging

335 Cf. Yoo et al. (2012), p. 1398.
336 Cf. Yoo et al. (2010), p. 725.
337 Cf. Bouwman & Fielt (2008), p. 23; den Hertog et al. (2010), p. 495.
338 Cf. Yoo et al. (2012), p. 1398.
339 Cf. Bouwman & Fielt (2008), p. 23; den Hertog et al. (2010), p. 496.
340 Cf. Barrett et al. (2015), p. 137.
341 Cf. Lusch & Nambisan (2015), p. 154.

market economies. As the overwhelming number of available information technologies with complex inter-relationships continuously grows and creates confusion about what is meant by technology or ICTs, the next subchapter briefly characterizes the key features of digital technology.[342]

3.4 Key Characteristics of Digital Technology

To better understand this transformative role of digital technology it is important to scrutinize some major characteristics of digital technology and digital innovation. These include the layered architecture, convergence and generativity, and will be described in the following.

3.4.1 The Layered Architecture of Digital Technology

First, according to the conceptualization as suggested by Yoo[343], digital technology is characterized by a layered architecture (Figure 3), consisting of four distinct layers: devices, networks, services and contents.[344]

According to Yoo, the device layer can be further divided into a physical machinery layer (e.g., computer hardware and phone) and a logical capability layer (e.g., operating system). The logical capability layer provides the control and the maintenance of the physical machine and connects the physical machine to other layers.[345] The network layer is similarly divided into a physical transport layer (including cables, radio spectrum, transmitters and so on) and a logical transmission layer (including network standards, such as TCP/IP or peer-to-peer protocols). The service layer deals with application functionality that directly serves users as they create, manipulate, store and consume contents. Finally, the contents layer includes data, such as texts, sounds, images and videos that are stored and shared.[346]

Indeed, with the rapid penetration of mobile networks and smartphones, the role of mobile services has become increasingly relevant for value creation.[347] Mobile services typically appear in the form of apps on smartphones that are enabled by technology platforms, like Apple's iOS or Google's Android. These technology platforms or mobile operating systems

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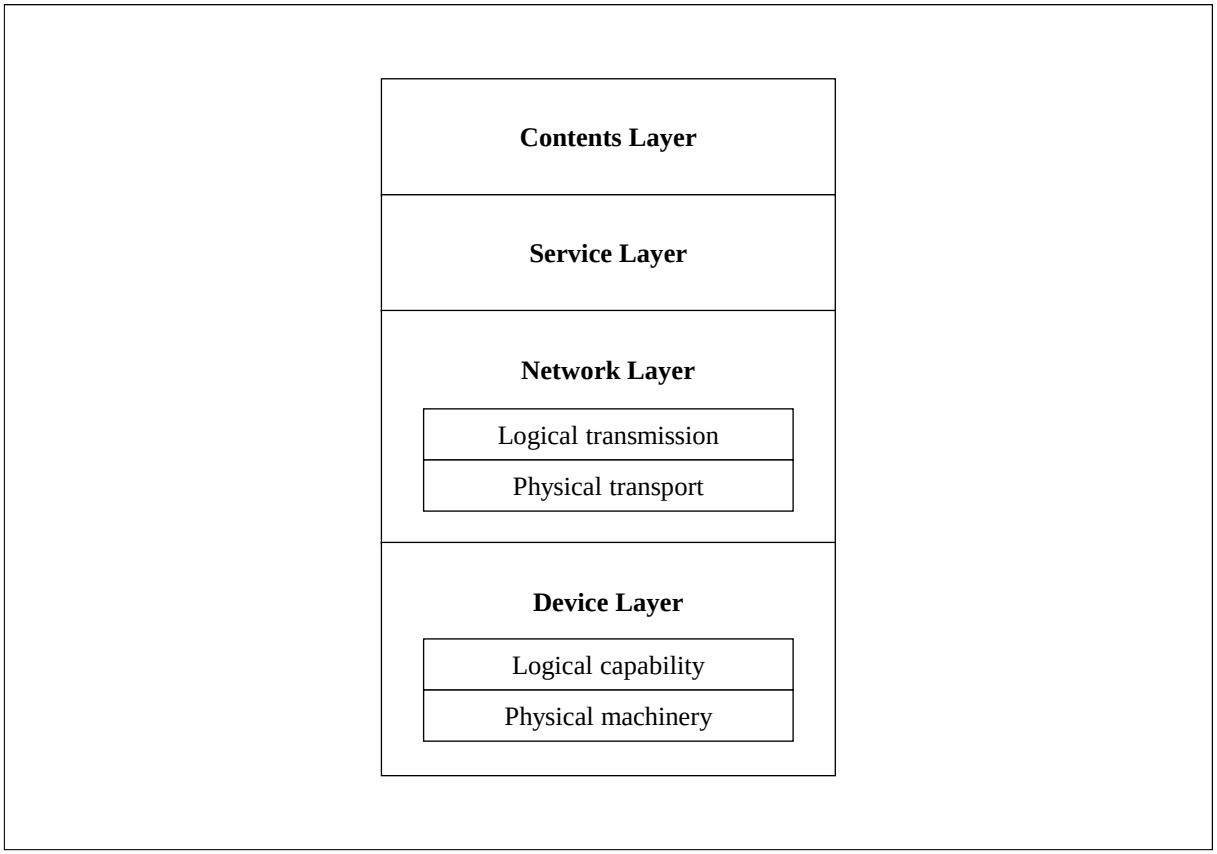
342 Cf. Adomavicius et al. (2008), p. 781.
343 Cf. Yoo et al. (2010), p. 726.
344 Cf. Farrell & Weiser (2003), pp. 90-91; Benkler (2006), pp. 412-418; Yoo et al. (2010), p. 726.
345 Cf. Benkler (2006), p. 412.
346 Cf. Yoo et al. (2010), pp. 726-727.
347 Value-adding mobile services are often considered to be those services that go beyond mere mobile voice (phone conversations and video conferencing) services and SMS services (Karhu (2007), p. 23).

Figure 3: The Layered Architecture of Digital Technology



Source: Adapted from Yoo et al. (2010), p. 726.

have been foundational for the success of apps, such as Uber or Airbnb and relevant for the emergence of music apps (e.g., Spotify) or payment apps (e.g., PayPal).[348] A mobile service is independent of time and place. It can be accessed via mobile devices which are connected to a mobile or wireless network[349] and they involve intense interaction between the customer and the service supplier's system.[350] The customer interacts with the service provider via the smartphone interface through which information are exchanged to co-create value.[351] In this sense, smartphones are not only digital gadgets but rather are the distribution mechanism or medium for service provision.[352] Mobile services, thus, can be considered as an example of digitally enabled service innovation. They are enabling innovative business models that can also help overcome barriers to provide affordable and self-sustainable social services.

348 Cf. Evans & Schmalensee (2016), p. 48.
349 Cf. Bouwman et al. (2008), p. 21.
350 Cf. den Hertog et al. (2010), pp. 492-494.
351 Cf. Gallouj (2002), p. 38.
352 Cf. Lusch & Nambisan (2015), p. 166.

Delivering social services in the emerging market region is usually constrained by the inability of end users to pay high access costs and the lack of basic institutional infrastructure for efficient service provision. In recent years, investors and social enterprises have increasingly leveraged the large area coverage of mobile networks and key mobile services, such as messaging, mobile money and message to message (M2M), to deliver scalable and commercially viable services. In contrast to developing physical products, developing mobile service innovations also involves substantially lower development costs.[353] Especially, local startups are increasingly leveraging these technologies to hack infrastructural gaps and to provide people with greater and more efficient access to new goods and services. This presents an opportunity for governments, development organizations and private sector players to generate greater social impact using mobile-enabled solutions, as can be seen in an increasing number of cases.[354] Mobile networks are fundamental enablers because they link mobile devices to the Internet, so that users can access diverse content providers, while content providers can get access to billions of people around the globe at very low costs.[355] Global platforms, such as Facebook and Google, which benefit from getting people on board, are investing in satellites and other technologies for spreading the Internet to the poorest parts of the world.[356]

In sum, the four layers represent distinct design hierarchies, this means that the individual design decisions for a specific layer can be made with a minimum consideration of the standard interfaces of other layers.[357] As a result, service designers and software developers can focus on one particular layer and pursue combinatorial innovation by connecting components from different layers using a set of protocols and standards to create new digital services, while relying on other designers to provide the necessary functionality of other layers.[358] In consideration of the underlying research purpose, which involves understanding how innovators develop and implement digitally enabled services, the focus is primarily on the development of new service and content layers in emerging markets, enabled by the rapid diffusion of affordable cellular and smart phones (device layer) and the expansion of the mobile broadband network (network layer).

353 Cf. Evans & Schmalensee (2016), p. 48.
354 Cf. GSMA (2017), p. 36.
355 Cf. Evans & Schmalensee (2016), p. 45.
356 Cf. ibid, p. 48.
357 Cf. Clark (1985), p. 241.
358 Cf. Gao & Iyer (2006), p. 121.

3.4.2 Convergence and Generativity

Furthermore, digital technology produces innovations characterized by convergence and generativity.[359] Convergence, for example, implies that digital technology can aggregate previously separate experiences, such as broadband Internet, phone and TV services, into one new comprehensive service offering provided by a single company. Convergence can also mean the bundlization of multiple performances provided by a single device. For example, a smartphone provides different functions, such as voice call, camera, music player, wallet and many other capabilities that a user could possibly need – all combined in a single device.[360] Hence, digital innovation is in a state of constant flux and reconfiguration, that transforms its value and utility dependent on the shifting functional relationships and interfaces with other artefacts across contexts.[361] Yet, the focus is not on a single company but rather on the network of heterogenous actors, such as companies, users and institutions, that engender digital innovation through the dynamic, messy and ambiguous interactions among them in a constantly shifting ecosystem.[362]

Generativity describes the adaptability and modification capability of digitally enabled innovation. It can also be understood as the (re)programmability of digital artefacts, which make it possible to separate the semiotic functional logic from the physical device that executes these functions.[363] Hence, both designers and users can reprogram the system's functionalities by continuously adding new services or value-adding features,[364] even though the product or service has been already designed and introduced into the market. This "procrastinated binding"[365] implies that digital innovation is inherently dynamic and malleable. They lack the plenitude and stability afforded by traditional items and devices, making innovation outcomes "intentionally incomplete"[366]. An illustrative example is the Apple iPhone with its 1.96 million available apps. Based upon its iOS platform, third-party developers can continually create new mobile apps[367] and thereby change the value of the physical device.[368] As a result, digital

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359 Cf. Yoo et al. (2012), p. 1399.
360 Cf. ibid.
361 Cf. Kallinikos et al. (2013), p. 357.
362 Cf. Boland et al. (2007), p. 633; Calabretta & Kleinsmann (2017), p. 297.
363 Cf. Yoo et al. (2010), p. 726.
364 Cf. Calabretta & Kleinsmann (2017), p. 297.
365 Yoo et al. (2012), p. 1399.
366 Garud et al. (2008), p. 351.
367 Cf. Tiwana et al. (2010), p. 675.
368 Cf. As of the third quarter of 2020, Android users had access to 2.87 million apps, making Google Play the app store with biggest number of available apps (Statista (2020a)).

platforms have become a key trait of digital innovation.[369] Eventually, these platforms enhance generativity[370] as they act as building blocks upon which other firms can develop complementary products, technologies and services.[371] Furthermore, digital technology promotes generativity because it generates an unprecedented volume of digital traces as by-products – as reflected in the popular idea of "big data".

Overall, digital innovation can be described as having an ambivalent ontology,[372] being intentionally incomplete and perpetually in the making,[373] creating unprecedented dynamics with both opportunities and challenges for the NSD process. All four service innovation dimensions, thus, are permanently in the development phase, as technological possibilities continually change. Expectedly, the innovation process is characterized by a high degree of flexibility, shifting from discrete and solid to a liquified process stages. Indeed, researchers argue that the distinct characteristics of digital innovation substantially change the way how innovators will develop new services, business models and even organizational forms.[374] The existing NSD literature provides two dominant approaches to service development, as will be presented in the following subchapter.

3.5 New Service Development

Developing new services can be defined as the set of activities, actions, tasks and evaluations that move a project from the idea stage through to launch.[375] Prior studies brought forth two major approaches of how to develop and implement service innovation. The first approach conceptualizes the NSD process as a structured, systematic and sequential procedure, while the second approach views the process as less formalized, emergent and interactive.[376]

3.5.1 Formalized New Service Development

Having a formalized NSD process is often considered one of the key success factors for service innovation.[377] The formalized view of the service innovation process is to a great extent inspired

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369 Cf. Yoo et al. (2012), p. 1400.
370 The concept of a platform is not a new one. However, the pervasive penetration of digital technology with its flexible nature has elevated the role of a platform and made it the central focus of many firms' innovation activities (ibid).
371 Cf. Gawer (2009), p. 2.
372 Cf. Kallinikos et al. (2013), pp. 357-358.
373 Cf. Garud et al. (2008), p. 356; Zittrain (2008), p. 69.
374 Cf. Yoo et al. (2012), p. 1399; Barrett et al. (2015).
375 Cf. Cooper (1994), p. 4.
376 Cf. Skålén et al. (2015), p. 140.
377 Cf. Witell et al. (2017), p. 291.

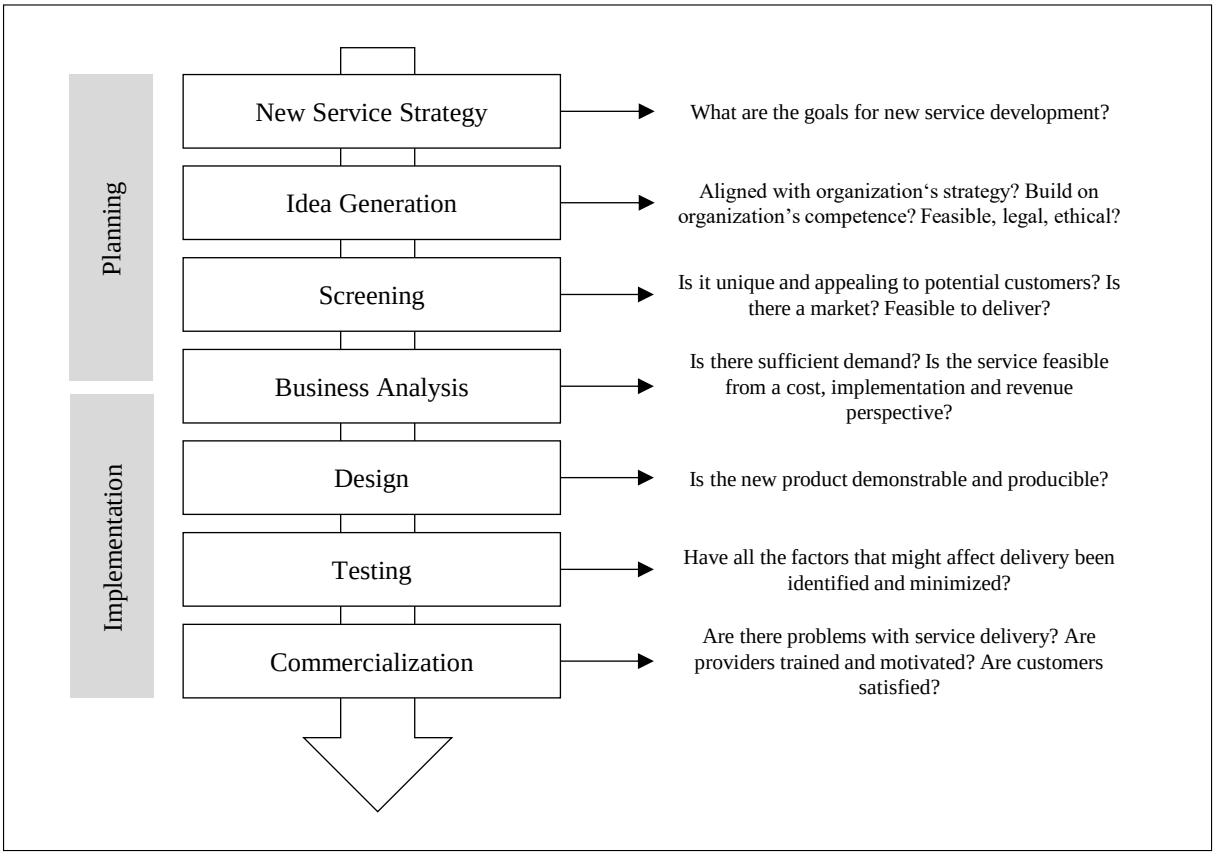
by NPD research.[378] Indeed, many NSD models have been based on a well-studied model of NPD, such as the sequential NPD approach, developed by the management consulting firm of Booz, Allen, and Hamilton,[379] or Cooper's stage-gate NPD model.[380] As these process models were considered successful in NPD, they were thought to naturally prove successful in the context of NSD.[381] The rationale behind structured process models is that formalization increases effectiveness and efficiency of the NSD process, which is positively associated with the success of the service innovation.[382] Figure 4 provides a generic version of the NSD process.

Systematic process models in the NSD literature mostly comprise four basic stages: design, analysis, development and full launch.[383] The design stage involves generating and screening new service ideas that are based on the market needs and consistent with a firm's strategic goals. Typical idea generation methods applied in this stage include brainstorming, product checklists and scenario analysis. In the analysis phase, the business attractiveness of the ideas is measured by assessing the project's potential return on investment and the likelihood of achieving the defined objectives. The development phase comprises both service concept development and testing. In addition, it also includes the conceptualization of the delivery system, marketing program, training operational and frontline personnel and incorporating user feedback. Eventually, the launch stage introduces the new service to the target market, and the post-launch review measures the service performance and modifies the project if necessary.[384] The first two stages, design and analysis, are also referred to as the planning phase of the NSD process, while the final two stages, development and launch, are considered as the implementation phase.

The expertise in both phases of the NSD process is regarded as an indicator of NSD competence.[385] Previous studies have empirically shown that the formalization of tasks

[378] Cf. Johnson et al. (2000), p. 9.
[379] Cf. BAH (1982).
[380] Cf. Cooper (1990); Cooper (1994).
[381] Cf. Johnson et al. (2000), p. 16; Stevens & Dimitriadis (2005), p. 177.
[382] Cf. Storey et al. (2016), p. 542.
[383] Cf. Witell et al. (2017), p. 291.
[384] Cf. Johnson et al. (2000), pp. 17-18; Melton & Hartline (2015), p. 113.
[385] Cf. Johnson et al. (2000), p. 19.

Figure 4: New Service Development Process



Source: Adapted from Booz, Allen and Hamilton (1982); Zeithaml & Bitner (2003).

involved in developing new services can lead to higher number of innovations, shortened development time and higher turnover and, as a result, improve a firm’s overall performance.[386]

While proponents of the formalized view argue that a high degree of process formalization has a positive impact on effectiveness and efficiency, it can also impede creativity and lead to less innovative services.[387] Formalized models of the service innovation process have in common that a service is regarded as output[388] or as a kind of good[389] with embedded value, and where customers and others do not play a role in the value creation process. This stands in contrast with the fundamental premise of the S-D logic, which assumes that value-creation occurs through a co-creative effort, in which customers[390] and frontline personnel[391] make a significant contribution to value creation. As the focus in formalized models is on value creation performed by the firm, some researchers think formalized NSD models to not fully capture the dynamic

386 Cf. Froehle et al. (2000), p. 7; Melton & Hartline (2015), p. 113.
387 Cf. Witell et al. (2017), p. 291.
388 Cf. Vargo & Lusch (2006), p. 47.
389 Cf. ibid.
390 Cf. Blazevic & Lievens (2008), p. 138; Chen et al. (2011), p. 1331.
391 Cf. Cadwallader et al. (2010), p. 220; Ordanini & Parasuraman (2011), p. 7.

and iterative processes of customer-supplier interactions, overseeing the interactive role of the customer in actual service provision.[392] One exemption is the interactive model developed by Johnson et al. This model reflects the iterative processes of NSD and factors in the feedback loops. Furthermore, this NSD process cycle stresses the non-linearity of the NSD process and incorporates enablers, such as teams, design tools, organizational culture, which together facilitate the design or redesign of the service delivery system.[393]

Another point of criticism is that the current knowledge on NSD is derived from studying large organizations with a relatively stable resource base. This means, that formalized service innovation process models build on the implicit assumption that firms access the necessary resources, recombine them and eventually convert them into new services. Hence, these models neglect situations in which organizations or entrepreneurs face severe resource constraints. Witell et al. argue that under such constraints, a formalized NSD process might be counterproductive and, thus, the authors suggest adopting a capability view to examine and explain service innovation in resource-constrained environments.[394]

3.5.2 Non-formalized New Service Development

The alternative view, which is beginning to receive more and more attention, adopts a practice-based perspective on the development of service innovation.[395] It assumes that service innovation processes are characterized by a low degree of formalization, and that they are explorative, flexible, emergent,[396] unplanned[397] and often conducted as ad-hoc problem-solving activity to respond to a particular issue.[398] It has been also acknowledged that the overall design of innovation processes is contingent on the context in which that process operates. In this vein, Cormack & Verganti propose that under conditions of certainty a formal stage-gate process is effective, whereas situations with low or no certainty require a process with a higher degree of flexibility.[399] The non-formalized view takes into account the impact of malleable and flexible information technologies on NSD models, which seem to break down the boundaries between the discrete stages of formalized service innovation process and create greater overlap in their temporal evolution. Proponents of the non-formalized view state that a practice-based

392 Cf. Menor et al. (2002), p. 145.
393 Cf. Johnson et al. (2000), pp. 17-18.
394 Cf. Witell et al. (2017), p. 290.
395 Cf. Fuglsang & Sørensen (2011), p. 581.
396 Cf. Toivonen & Tuominen (2009), p. 898; Zomerdijk & Voss (2011), p. 63.
397 Cf. Sundbo (1997), p. 445.
398 Cf. Gallouj & Weinstein (1997), p. 549.
399 Cf. MacCormack et al. (2001), pp. 134-136; MacCormack & Verganti (2003), p. 220.

perspective appears to be more adequate for capturing the bottom-up, emerging, multifaceted and serendipitous nature of service innovation.[400]

A practice can be understood as the routine activities, techniques and sense-making frameworks that people carry out and use in a particular context. According to Reckwitz, a practice can be defined as routinized type of behavior, which involves bodily and mental activities, objects and their use, background knowledge, know-how and states of emotion.[401] This means that the notion of practice does not merely involve physical or mental skills, but rather needs to be regarded as the active integration of objects, meanings and forms of competence. For example, the practice of Nordic walking can be described as an interweaving of competence and skills (how to do Nordic walking), symbolic meaning and images (what it means to do it) and objects (the material stuff that is part of doing it).[402] Similarly, any new service can be regarded as a new practice, as it often entails the implementation of an entanglement of activities, bodies and artifacts,[403] enacted through other practices by some individuals in a certain setting. The focus is often, how new practices are established as taken-for granted practices through diffusion, yet little is known through which practices new practices in a social system have been established.[404] This practice-based perspective appears adequate for the purpose of this study to explore new service development activities and practices in resource-constrained environments.

One practice that has recently been found relevant in the context of NSD occurring under conditions of resource scarcity is the concept of bricolage. It is based on the assumption that the development of a new solution is an explorative problem-solving activity that creates structure using the resources at hand, as already stated in Subchapter 2.5.4.[405] Bricolage takes advantage of opportunities by combining existing resources.[406] Witell et al., for instance, conceptualize bricolage as a set of four capabilities: "addressing resource scarcity actively, making do with what is available, improvising when recombining resources, and networking with external partners."[407] It can be seen as a way of innovating by "muddling through"[408], requiring dynamic actions and flexible decision-making and thus appears interesting for

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400 Cf. Skålén et al. (2015), p. 140; Ciriello et al. (2017), p. 2.
401 Cf. Reckwitz (2002), p. 249.
402 Cf. Shove & Pantzar (2005), p. 45.
403 Cf. Orlikowski & Scott (2015), p. 7.
404 Cf. Lounsbury & Crumley (2007), p. 993; Barrett et al. (2015), p. 144.
405 Cf. Fuglsang & Sørensen (2011), p. 583; Skålén et al. (2015), p. 140.
406 Cf. Baker & Nelson (2005).
407 Witell et al. (2017), p. 290.
408 Cf. Lindblom (1959).

settings, where innovators face severe resource constraints. In the context of digital innovation, scholars advocate for the adoption of a practice perspective, because it is regarded as the appropriate level of analysis to capture the complexity of digital innovation.[409] More specifically, some scholars stress the practice of design in creating service innovation.[410]

Literature often defines design narrowly, namely as a distinct stage in the service innovation process, which comes before prototyping, business model analysis and implementation. The practice of designing services, in turn, has gained increasing attention, especially in view of the new value creation logics as exemplified by companies such as Google, Uber and Airbnb. Increasingly, design and design thinking are often viewed as foundational to innovation processes in the digital age. In particular, the design thinking approach is considered an influential human-centered practice to problem-solving. Moreover, it is viewed as a helpful instrument for innovation in contemporary business but also in engaging with a wide range of services and in addressing social problems.[411] It typically represents an iterative process that moves from exploration, generating insights on end users, rapid prototyping, concept development and interpretation of unexpressed and latent needs.[412] As a theoretical extension of design thinking,[413] Kimbell introduced the concept of "designing for services"[414]. In this approach, design is viewed as a context-specific accomplishment involving multiple actors from diverse domains that recognize the role of digital artifacts and other relevant practices. For example, the mobile service innovation M-Pesa highlights that the service was enabled through a wide range of emergent practices performed by a wide range of actors, including users, network agents and producers, resulting in a novel socio-material practice.[415] In this vein, Calabretta states that design practices are becoming progressively more essential, resulting in the need to integrate design with other business functions.[416]

Overall, the creation of digital services has become a major source of competitive advantage for companies from all business sectors to compete in the digitalized economy. Lusch & Nambisan, therefore, claim that: "Service innovation in the Digital Age"[417] requires new frameworks to explain the potential impact of IT capabilities on how people innovate with

409 Cf. Ciriello et al. (2017), p. 2.
410 Cf. Barrett et al. (2015), p. 149; Calabretta & Kleinsmann (2017), p. 292.
411 Cf. Kimbell (2011b), p. 289.
412 Cf. Brown (2008), pp. 88-89; Kimbell (2011b), p. 287.
413 Cf. Brown & Wyatt (2010), p. 31.
414 Kimbell (2011a), p. 45.
415 Cf. Orlikowski (2016), p. 1439.
416 Cf. Calabretta & Kleinsmann (2017), p. 298.
417 Lusch & Nambisan (2015), p. 156.

services. This claim finds support through the assumption, that a practice perspective can help to see innovation not only as a one-off moment, but rather as a continuous and ongoing process of something people do and enact in an ongoing mode.[418] Formalized models, on the other hand, have the key advantage that they provide a holistic picture of the service innovation process and serve as relevant managerial tool. Yet, they say little about how service innovation takes place at the micro-level and even less how service innovation processes find their way through under severe conditions of scarcity as prevalent in the emerging market context. So far, only little attention has been devoted to this latter question of how new digital services are developed and implemented in the context of emerging markets, settings which are characterized by substantially different context conditions. This severe gap builds the key motivation of this study to shed light on this particular question.

3.6 Summary

All in all, the research literature posits the role of digital service innovation as increasingly prevalent, complex and impactful and gaining in relevance for both developed and emerging market economies. Technological advancements in information systems and mobile telecommunication substantially changed the way of interacting with users,[419] while also providing unprecedented opportunities to create value, develop solutions cost-effectively, improve accessibility and establish creative business models.[420]

Transformative new services in emerging markets, such as M-Pesa, show that such an increased penetration of the Internet, mobile telecommunications and the Web 2.0 demonstrate the transformational capabilities of technology and its implications of creating new service experiences and realities in the social lives of human beings. The impact of these solutions might be magnified due to the high leap-frogging potential, bringing people in contact with state-of-the-art solutions and artefacts of modernity.

Yet, while research offers various approaches to managing innovations in emerging markets in general, little is yet known about how innovators innovate with digital technology to create new services that improve the situation of local customers. To address this severe gap, this study suggests adopting the contemporary S-D perspective, which provides a broadened

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418 Cf. Pantzar & Shove (2010), p. 447.
419 Cf. Bilgram et al. (2008), p. 424.
420 Cf. Agarwal et al. (2017), p. 11.

conceptualization of service innovations, and which focuses on the capabilities, practices, resources, knowledge and skills to develop a new service (a new resource) for the beneficiary.

Creating a better understanding of how innovators innovate with digital technology, artefacts of modernity, in an institutionally difficult and resource-scarce environment, is not only of practical and theoretical value, but also of ethical relevance, because digital service innovation can trigger large-scale societal improvements, as exemplified by the emergent examples of mobile payment services across sub-Saharan Africa. Yet, there is limited insight in the activities and emergent practices performed to develop and implement these services and what kind of value is delivered. This study, therefore, seeks to expand and build on the understanding of the nature and management of constraint-based innovation from the S-D logic perspective that takes into account the transformative role of digital technology by exploring the central research question:

How do innovators develop and implement digital service innovations in the context of emerging market economies?

This research endeavor will be guided by the following sub-questions:

- What are the constraints that innovators encounter along the service innovation process?
- What activities and practices do innovators adopt to develop and implement digital service innovation in emerging markets?
- What kinds of value are created through these practices?

4 METHODOLOGY AND RESEARCH DESIGN

This chapter presents the methodological approach that is employed to answer the research question. Since the method selection is derived from the paradigm, Subchapter 4.1 briefly discusses three dominant paradigmatic positions. Afterwards, quantitative and qualitative methodologies (4.2) are outlined to justify the research method for this study. As the case study research provides the frame for conducting the research, Subchapter 4.3 describes the case design, the overall research procedure, the research context, the case selection process and presents the selected cases. After that, the applied data collection methods are portrayed (4.4), followed by the description of the different phases of data analysis (4.5). This methodological chapter terminates with the discussion of the quality criteria (4.6).

4.1 Paradigmatic Positions

A research paradigm comprises the researcher's set of philosophical assumptions (explicit or implicit) about the nature of reality and how the knowledge about it can be acquired. These assumptions, or basic beliefs, are the core components of different research paradigms which influence the choice of the research method.[421] Most important in this regard are the ontological, epistemological and methodological beliefs of the researcher. The ontological assumption states what kind of reality from the perspective of the researcher exists: a singular, objective reality or multiple socially constructed realities.[422] The epistemological assumption refers to "… the nature of knowledge and the process by which knowledge is acquired and validated"[423]. A researcher's ontology leads to certain epistemological beliefs, specifically if people should be studied from an objective perspective to discover "how things really are" or whether there is a need to understand phenomena in their contexts. Thus, it examines the relationship between knowledge and the researcher. The methodological assumptions are more specific and practice-based than the questions concerning epistemology and describes how the researcher discovers knowledge in a systematic way. It is the "… strategy, plan of action, process or design"[424] that informs one's choice of research methods. The chosen methods are the specific tools for data collection and data analysis including questionnaires and open-ended interviews. The choice of research methods depends on the design of the research project and the researcher's theoretical

421 Cf. Guba & Lincoln (1994), p. 105.
422 Cf. Patton (2002), p. 134.
423 Gall et al. (2002), p. 13.
424 Crotty (1998), p. 3.

mindset. Literature often differentiates between three major research paradigms: (1) positivism, (2) post-positivism and (3) interpretivism, which will be briefly reviewed.

Positivism. Positivists adopt the stance of realism and assume that there is only one objective verifiable reality, that exists independently of humans. Inspired by natural sciences, positivists come in as objective observers to study social phenomena as features of social reality that are assumed to be governed by certain laws.[425] Positivists are concerned with proposing and testing hypotheses about cause-effect relationships between social phenomena, which are confirmed or rejected depending on the results of statistical analysis. To do so, positivist researchers gather quantitative data which is then analyzed to formulate a theory to illustrate the causality between social phenomena. The major goal is to gain a predictive understanding of incidents in the real world.[426]

Post-positivism. Post-positivism emerged as a critique to the positivist paradigm, and "straddles both the positivist and interpretivist paradigms"[427]. Post-positivist researchers assume an objective reality "… to exist but to be only imperfectly comprehensible because of basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena"[428]. The ontology of post-positivism is one of critical realism. It assumes that it is possible to approximate (but never fully know) reality, and it recognizes that the researcher's beliefs, background knowledge and values can influence what is being observed. Post-positivists consider scientific findings as temporary until they have been falsified because reality can only be known through probabilities.[429] Falsifying prior hypotheses or contradicting previous knowledge is the basic task for post-positivist researchers. Falsification is a very rigorous test to which scientific findings can be subjected. Post-positivist research, hence, draws on multiple methods to capture as much of reality as possible as, for example, applied in mixed method studies.[430]

Interpretivism. Interpretivists reject the notion of a single, objective reality or knowledge, which exists independent of human senses.[431] Instead, interpretivists believe in socially constructed multiple realities. From this stance, truth and reality result from an active

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425 Cf. Gephart (2004), p. 456.
426 Cf. Guba & Lincoln (1994), p. 106.
427 Grix (2004), p. 86.
428 Guba & Lincoln (1994), p. 110.
429 Cf. Gephart (2004), p. 456; Popper (2014), pp. 48-51.
430 Cf. Guba & Lincoln (1994), pp. 111-112.
431 Cf. Rehman & Alharthi (2016), p. 55.

constructive process,[432] whereby individuals interact with one another and ascribe meaning to different social phenomena.[433] The researcher is not 'detached' from the subject being studied, instead he/she is part of the social reality being investigated.[434] Interpretivism does not aim at discovering universal, context-free knowledge, it rather tries to understand the multiple interpretations of individuals about the social phenomena.[435] To do so, interpretivists mostly collect qualitative data from participants (e.g., through interviews, observations, field notes, personal notes, documents etc.) over an extended time-period, as in ethnography and case studies, and adopt an inductive approach to analyze the data. The goal is to discover patterns in the data by analyzing words, statements and events which can be systematically reconstructed to generate theory.[436]

This study does not view the three paradigms as three different 'religions', where one is obliged to "… force oneself to abide by the creed of a philosophical or methodological tradition just to avert the threat or accusation of 'intellectual excommunication'"[437], as Rehman & Alharthi put it. Instead, the rational applied here is to choose a methodology and corresponding methods, which seem adequate for the investigation of the phenomenon.

Given the overall limited understanding of service innovation in emerging markets associated with the rapid penetration of digital technology and how entrepreneurs go about developing and implementing these services in these environments, represents a complex social phenomenon, which can be appropriately investigated from an interpretive stance. The goal is to understand the multiple interpretations of individuals about this current social phenomenon. A deductive approach appears inadequate "… to explore the complexities and conundrums"[438], associated with the phenomenon under investigation. Yet, before the research method and research design are presented, it is important to clarify the major strengths and weaknesses of qualitative in comparison to quantitative methodologies.

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[432] Cf. Guba & Lincoln (1994), p. 111; Flick (2004), p. 89.
[433] Cf. Rehman & Alharthi (2016), p. 55.
[434] Cf. Grix (2004), p. 83.
[435] Cf. Cohen et al. (2007), p. 21.
[436] Cf. Grix (2004), p. 108.
[437] Rehman & Alharthi (2016), p. 58.
[438] Richards (2003), p. 6.

4.2 Methodology

Methodology is concerned with the question of how the world should be studied. It guides the researcher in determining the set of data production techniques that will be most suitable for the purpose of the study.[439] This section briefly presents the most important aspects of qualitative and quantitative research methodologies to justify the methodology selected for this research endeavor.

Quantitative Research. The quantitative research is predominantly concerned with the analysis of cause-effect relationships between pre-defined variables. A crucial step is the development of precise hypotheses about specific relations between dependent and independent variables and the operational definition of these variables as a necessary precondition of empirical research. The quantitative method then tests these hypotheses for confirmation or rejection by gathering numerical data and employing standardized statistical procedures on a representative sample of data. The actual data analysis, thus, is a rather technical procedure. If it is confirmed that A caused B, then a theory is formulated for wider applicability. The attractiveness of quantitative research lies in its precision (hypotheses either supported or rejected)[440] as well as in its greater objectivity and reliability due to clear analytical techniques, procedures and measures. High generalizability and external validity, derived from the large statistical sample, are considered further strengths of quantitative approaches.[441]

However, quantitative researchers also often face severe criticism. First and foremost, they are blamed for their alienation from the investigated social reality. A direct involvement in the social world, to gain an adequate understanding of the social phenomena under investigation, is abandoned. Hence, quantitative methods fall short when they are employed to study social phenomena internal to the individual, and, thus, cannot capture the interpretation of the perceived reality. Quantitative techniques are also inappropriate to account for context-bound patterns, structures and rules that make up social life. Likewise, they are not capable of observing social activities.[442]

Qualitative Research. Qualitative research aims at observing authentic experiences to understand social reality. The goal is to obtain a more realistic picture of the social world, which

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439 Cf. Ellen (1984), p. 9.
440 Cf. Grix (2004), pp. 81-82.
441 Cf. Girtler (1984).
442 Cf. Filstead (1970).

cannot be recorded in numerical data. Hence, qualitative research is less driven by sharp hypotheses and exact definitions of variables but is more concerned with the development of propositions along the course of the research process. To do so, this approach seeks at accurately describing, decoding and interpreting the meanings of social phenomena occurring in their natural settings.[443] The investigation, thus, focuses on the analysis of everyday activities, or, as van Maanen puts it, on "… defined, enacted, smoothed, and made problematic by persons going about their normal routines"[444]. The data collection and data analysis are performed in a more flexible, open and iterative process. Qualitative researchers mostly collect verbal, instead of statistical, data, based on soft methods (e.g., interviews or case studies), which is usually audio- or video-recorded to, as Gall et al. phrase it, "… preserve the events in a fairly authentic manner for subsequent data analysis"[445]. The approach to analyze data is inductive, involving interpretive techniques that produce rich results, usually presented in a narrative form. The art of qualitative research is to deal with the enormous amount of information and to discover meaningful patterns concealed under broad themes to understand a social phenomenon and to generate theories.

A key strength of the qualitative method is a realistic and holistic view of the phenomenon in its natural setting[446] and the direct involvement with the research subjects to capture real-life experiences expressed by individuals in their own territory and in their own language and on their own terms.[447] It is also suitable for discovering and exploring new areas of research. Qualitative research has also been criticized for being 'soft', incapable of generating theories that could be generalized to larger populations (limited generalizability) and being vulnerable to subjective interpretations of the researcher due to the interaction with the participants. Furthermore, the research lacks fixed research designs and appears difficult to be reproduced.[448]

Choosing the appropriate methodology is crucial for the success of the research.[449] Considering that this study aims at understanding the various innovation activities that innovators perform in the context of emerging markets to develop and implement a new service successfully, an in-depth understanding about the experiences the innovators made in these real-life environments is required. A qualitative research approach, hence, seems to be most suitable to support this

443 Cf. Flick et al. (2004), pp. 6-9.
444 van Maanen (1983), p. 10.
445 Gall et al. (2002), p. 21.
446 Cf. Miles & Huberman (1994), p. 10.
447 Cf. Kirk & Miller (1986), p. 9.
448 Cf. Katz (1983), p. 128.
449 Cf. Yin (2014), pp. 3-5.

endeavor[450] because it allows to inductively build a theory through a continuous interplay between data collection and data analysis.[451]

By grounding the concept of a digital service innovation within the data sample, the theory derived from the study is "conceptually dense"[452], as Strauss & Corbin call it. Furthermore, the explorative character of the qualitative research is suitable for generating new insights in the theoretical and empirically immature field of digital service innovation in emerging markets. Most insights in this research field provide rich descriptions of constraint-based innovation approaches with their inherent attributes. But only little is known about the process or the activities to achieve these outcomes, specifically by using the transformational capacities of digital technologies,[453] and, thus, research provides only limited theoretical insights into performative activities in these environments. A qualitative research approach may address this issue to enhance the empirical substantiation. Furthermore, the inductive character of qualitative research allows a direct and detailed examination of innovation activities and practices related to the development and the implementation of digital services, which advocates a realistic ascertainment of the investigated phenomenon.[454]

4.3 Case Study Research

Case Study. Among various approaches of inquiry, this study is positioned as a case study to address the above-formulated research question. Case study research is a qualitative method and represents an established approach for exploring complex phenomena in areas with limited or immature theoretical insights.[455] A case study is defined by Yin as "… an empirical inquiry that investigates a contemporary phenomenon ("the case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident".[456] A key advantage of case study research is that it allows holistically exploring a phenomenon by recognizing its complexity and context.[457] Case study research is also considered to be a holistic research strategy, covering the logic of the research design, the data collection instruments and specific techniques to data analysis.[458] Phenomena-driven research

450 Cf. Eisenhardt (1989), p. 532.
451 Cf. Glaser & Strauss (1967); Strauss & Corbin (1994).
452 Strauss & Corbin (1994), p. 278.
453 Cf. Prahalad (2012); Agarwal et al. (2017).
454 Cf. Strauss & Corbin (1994).
455 Cf. Yin (2014), p. 4.
456 ibid, p. 16.
457 Cf. Eisenhardt (1989), p. 548; Siggelkow (2007), p. 21; Yin (2014).
458 Cf. Yin (2014), p. 17.

is also a widely accepted approach in innovation research,[459] and, thus, provides the methodological frame for this study.

According to Yin, case studies are advantageous in situations when research questions focus on 'how' or 'why' questions, when a researcher has very little or no control over behavioral events and when the focus of the study is a complex and a contemporary social phenomenon.[460] These three criteria are in line with the objectives of this inquiry. First, the study aims at gaining an in-depth understanding of the diverse activities that innovators perform to successfully develop and implement a digital service innovation in the context of emerging markets, posing the question of 'how' innovators act. Second, the researcher's control over the associated events may be considered minimal compared to an experiment in a controlled laboratory setting. Third, this study investigates the emergence of digital service innovation in resource-constrained environments, which represents a contemporary complex social phenomenon that is not well understood.[461]

A great advantage of case study research is the ability to incorporate various sources of evidence, such as documents, interviews, videos and observations, and its flexibility to integrate other research methods. Eisenhardt points out that case study research is particularly appropriate in situations when little is known about the phenomenon, current perspectives seem inadequate because they have little empirical substantiation or conflict with each other.[462] As reviewed above (see Subchapter 2.6), prior research provides only limited theoretical insights in the nature and the process of digital service innovation in resource-scarce environments and does not adequately reflect how digital technology is leveraged to respond to context-specific issues.

The key objective of case studies is according to Yin "… to expand and generalize theories (analytical generalization) and not to enumerate frequencies (statistical generalization)"[463]. The central notion is, thus, to inductively develop a theory.[464] In this sense, the explorative and the inductive character of the case study approach matches this study's interpretive research position.

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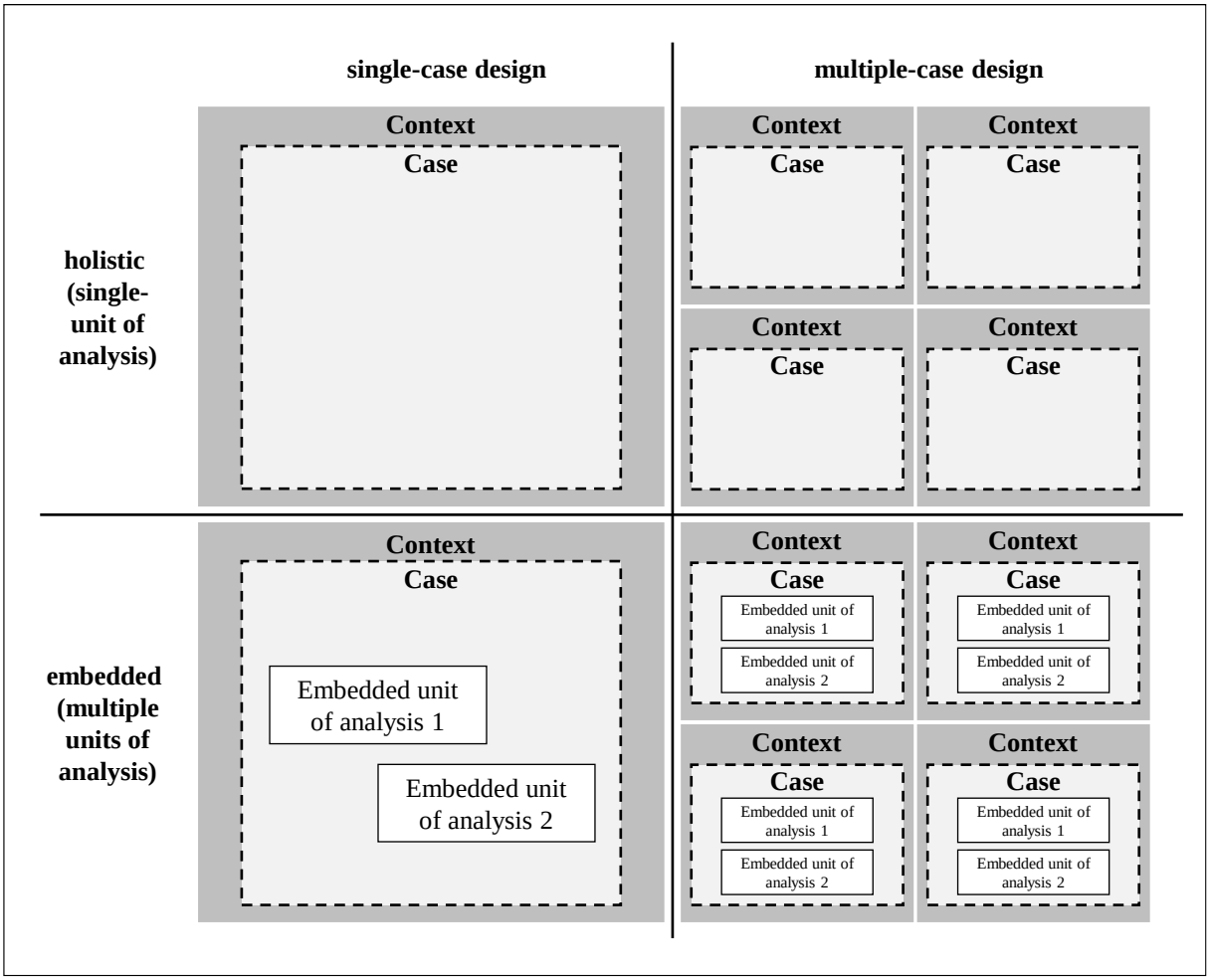
459 Cf. Prahalad (2012); Viswanathan & Sridharan (2012); Benner & Tushman (2015); Srivastava & Shainesh (2015); Witell et al. (2017).
460 Cf. Yin (2014), p. 2.
461 Cf. Eisenhardt (1989), p. 534.
462 Cf. ibid, p. 548.
463 Yin (2014), p. 21.
464 Cf. Eisenhardt (1989), p. 532.

Furthermore, this case study also presents an opportunity to respond to several calls to provide more phenomena-anchored research on innovation, especially considering the dramatic shifts in the locus of innovation driven by the digital revolution. Several researchers, hence, claim that it is necessary "… to shift from mature, deductive scholarship to more inductive and phenomena-driven scholarship"[465] to explore new ideas, concepts and mechanisms that better align with the changed innovation domain in both developed and emerging economies.[466]

Case Design. Critical to the case study design are two important steps: defining the case or unit of analysis to be studied and determining the number of cases. These decisions guide the investigation and determine the scope of the cases. As displayed in Figure 5, four different case designs can be distinguished.

Figure 5: Basic Types of Designs for Case Studies



Source: Adapted from Yin (2014), p. 50.

[465] Benner & Tushman (2015), p. 2.
[466] Cf. Barrett et al. (2015).

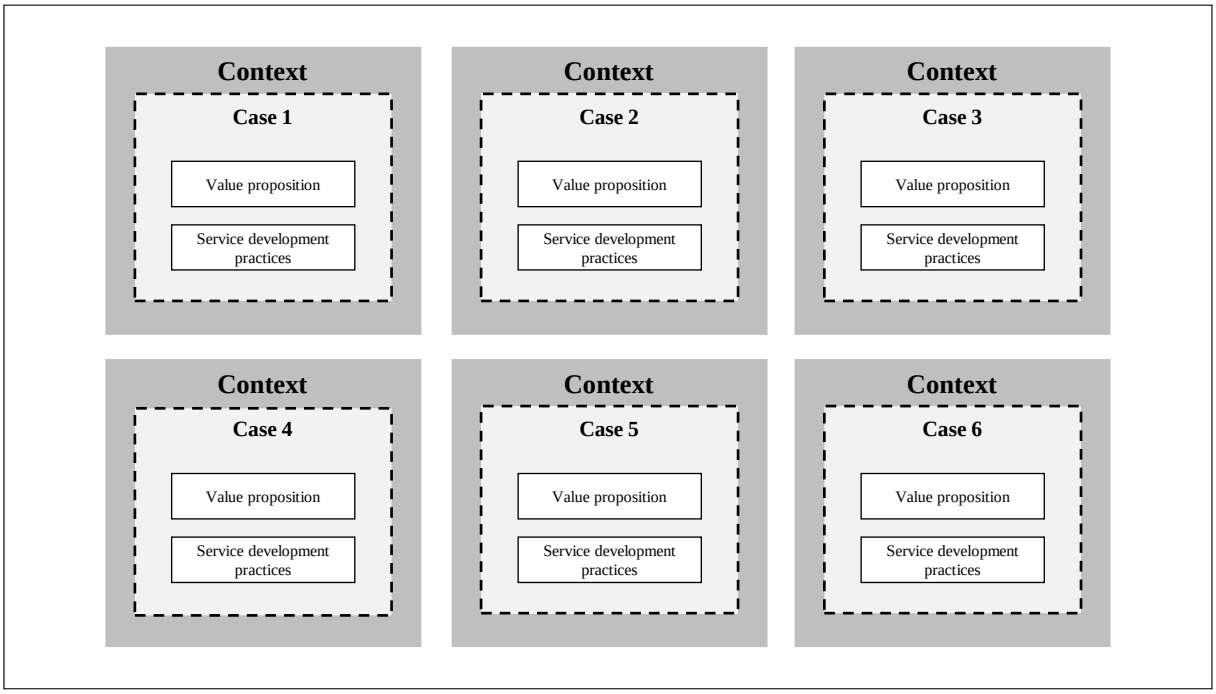
First, a case can be of holistic nature which examines only the global nature of a firm or the embedded subcases and the units of analysis at more than one level within an overall holistic case.[467] The holistic design is advantageous in situations where no logical subunits can be identified. However, the problem with a holistic design is that the researcher avoids examining specific details, and, thus, the study is conducted at a very abstract level. The key pitfall from the embedded design is that a case study remains at the subunit level and fails to return to the larger unit of analysis.[468]

Second, in designing and conducting case studies, the number of cases needs to be determined. There is a general distinction between single- and multiple-case study designs. The rational for selecting a single-case design is when the case is unusually revelatory, an extreme example or an opportunity for unique research access.[469] Single-case studies typically investigate unexplored and complex phenomena under extreme circumstances.[470] While single-case studies can richly describe the existence of a phenomenon,[471] multiple-case studies may provide more robust findings because the theory is better grounded and more accurate when it is based on multiple-case experiments.[472]

For this research, an embedded multiple-case study approach is employed. The study investigates the service development process of six different tech startups in the transportation sector in sub-Saharan Africa, as displayed in Figure 6 below. The focus is on the investigation of the service development activities performed at the level of its founders and the created value, as reflected in the anatomy of the value proposition. A multiple-case design has been selected to develop a more in-depth understanding of the phenomenon than a single-case can offer, because it provides more extensive descriptions and explanations of the phenomenon or issue. This is an important feature for theory evolution, which is a major goal of this study. According to Eisenhardt, a major strength of a multiple-case study research lies in its likelihood of generating testable hypotheses and a new theory. Another strength is that the new theory is theoretically valid because the theory-building process is substantiated in empirical evidence, producing a theory which closely mirrors reality.[473] One caveat of a case study research, however, is the intensive use of voluminous data, which may lead to a complex theory that tries

467 Cf. Yin (2014), pp. 50-55.
468 Cf. ibid, p. 55.
469 Cf. ibid, p. 50.
470 Cf. Eisenhardt & Graebner (2007), p. 27.
471 Cf. Siggelkow (2007), p. 20.
472 Cf. Eisenhardt & Graebner (2007), p. 27; Yin (2014), p. 57.
473 Cf. Eisenhardt (1989), p. 547.

Figure 6: Multiple-Case Study Design



Source: Adapted from Yin (2014), p. 50.

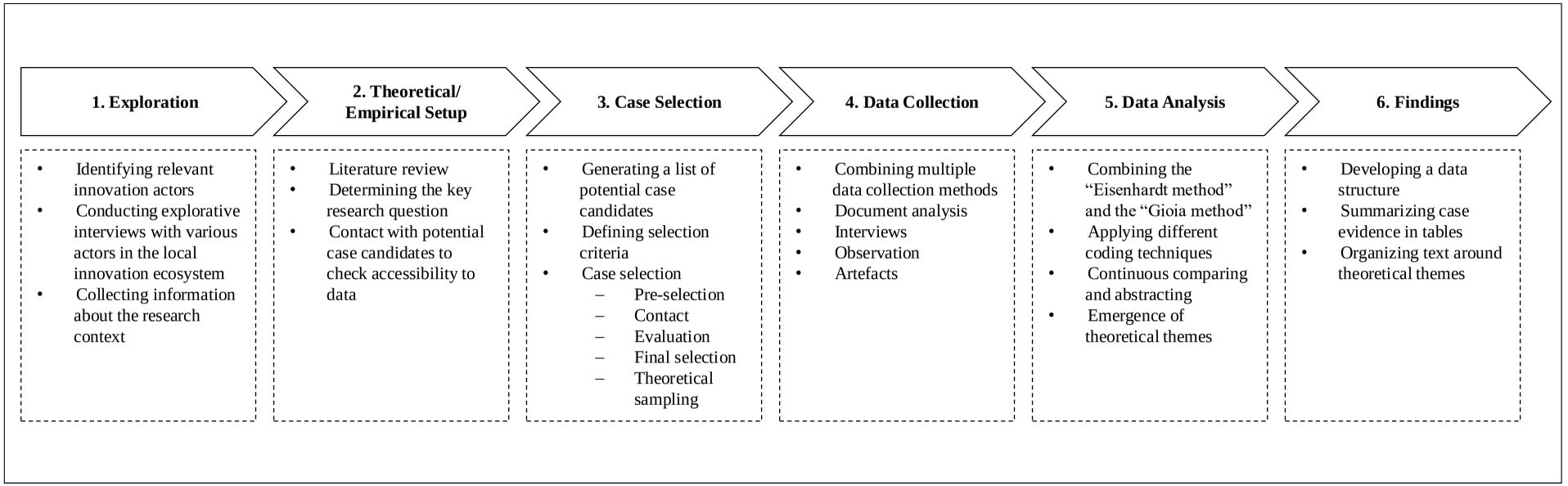
to comprise everything. A major risk is that the theorist loses the overview and oversees relevant relationships among emergent constructs. Another potential weakness is the emergence of a narrow and idiosyncratic theory that lacks generalization.[474] Furthermore, a key concern in conducting case study research is the lack of methodological rigor. Thus, following systematic procedures is important.[475] The research procedure of this study will be presented in the following section.

4.3.1 Research Process

The research process design describes the logical sequence connecting the empirical data to the initial research question of the study and, ultimately, to the conclusions.[476] In more practical terms, it is the plan that, as Nachmias & Nachmias phrase it, "… guides the investigator in the process of collecting, analyzing, and interpreting observations"[477]. This study's research design was guided by the research approach of a multiple-case study and divided into six main phases (Figure 7). The research process was highly iterative, continually shifting between data collection and data analysis.

474 Cf. Eisenhardt (1989).
475 Cf. Yin (2014), p. 19.
476 Cf. ibid, p. 28.
477 Frankfort-Nachmias & Nachmias (1992), pp. 77-78.

Figure 7: Research Process



Source: Own illustration.

In a first explorative phase, the goal was to tap into the unknown research context to gain more certainty about some major aspects of the anticipated case study with regards to the questions asked, the access to the data and the choice of data collection methods.[478] This phase was particularly vital to investigate these issues and to identify eligible case candidates in the local ecosystem for the later case selection procedure.

In the second phase of this case study's research process, the existing emerging market and (service) innovation literature (see Chapter 2 and 3) has been studied to define the key research question.[479] The definition of the research question was important as it provided a well-defined focus to collect specific kinds of data, when entering the field. During this phase, the author also contacted some key informants at the research sites. This was helpful to establish an initial understanding of the local context factors and key constraints in the transportation sector, which young tech firms experienced as having an impact on their innovation activities.

The third phase comprised the selection of the case candidates. One key selection criterion that was adopted for case inclusion was that the case candidate to be studied needed to have implemented or was at least in the process of implementing an innovative solution in the local environment, so that innovation activities were known to have occurred or were likely to be observed. Contacts were established to gain relevant information for evaluation purposes. The cases were finally chosen on the grounds of their theoretical relevance rather than their representativeness.[480]

The fourth phase involved the data collection. It comprised multiple data collection methods, including interviews, observations, archival sources and artefacts from six young tech startups located in three African economies. While the heart of the study was conducting interviews with the founders of the companies to gain a deep insight in the service concept and innovation activities, documentary data was included and studied simultaneously. The data collection was based on theoretical sampling, i.e., the selection of the 16 respondents[481] was guided by their theoretical relevance.

In the fifth phase, the collected data has been analyzed. Two major techniques to analyze the data were combined: the multiple-case studies approach ("Eisenhardt method")[482] and in-depth

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478 Cf. Yin (2014), pp. 29-30.
479 Cf. Eisenhardt (1989), p. 536.
480 Cf. Eisenhardt & Graebner (2007), p. 27.
481 See Table 5.
482 Cf. Eisenhardt (1989).

inductive case research ("Gioia method")[483]. In the analysis process, the author, thereby, employed various coding techniques to examine and interpret the data. Multiple iterations of abstracting and comparing helped to translate the informant's experiences to theoretical themes, finally resulting in constructs grounded in theory.[484]

The sixth phase reflects the presentation of the empirical findings, supported by a data structure. Furthermore, the case evidence was summarized in tables, while the text was organized around the theory.[485] Even though the process is presented in a linear logic, there were many iterations among the phases to unearth the results of this investigation. The following subchapters will describe these phases in more detail. While the research question has been already formulated in Subchapter 3.6, the research context of the case study will be presented next.

4.3.2 Research Context

The rapid penetration of mobile technologies in sub-Saharan Africa provided the foundation for the development of new services. Therefore, understanding the technological developments of this region is part of the context. Then, the focus shifts to the specificities of local transportation sector.

The Emergence of the Mobile Economy. The rapid penetration of information and communication networks, in particular the mobile Internet, provides a fertile ground for innovation and growth in sub-Saharan Africa.[486] In 2018, approximately 450 million people had a mobile subscription in the region, an increase of 20 million compared to 2017 and representing a mobile penetration rate of 44%.[487] Around 240 million people in sub-Saharan Africa, equivalent to 23% of the population, also used the mobile Internet on a regular base. By 2025, this figure is expected to rise to 483 million people, using the Internet, connecting them to services in health-care, education, finance, retail and government. Mobile networks now cover more than 90% of the total population in the region, with more than half also covered by high-speed mobile broadband networks.[488]

Figure 8 displays the number of Internet users in selected African countries, as of June 2019. It shows, for example, that Nigeria is leading the ranking with 123.5 million Internet users, while

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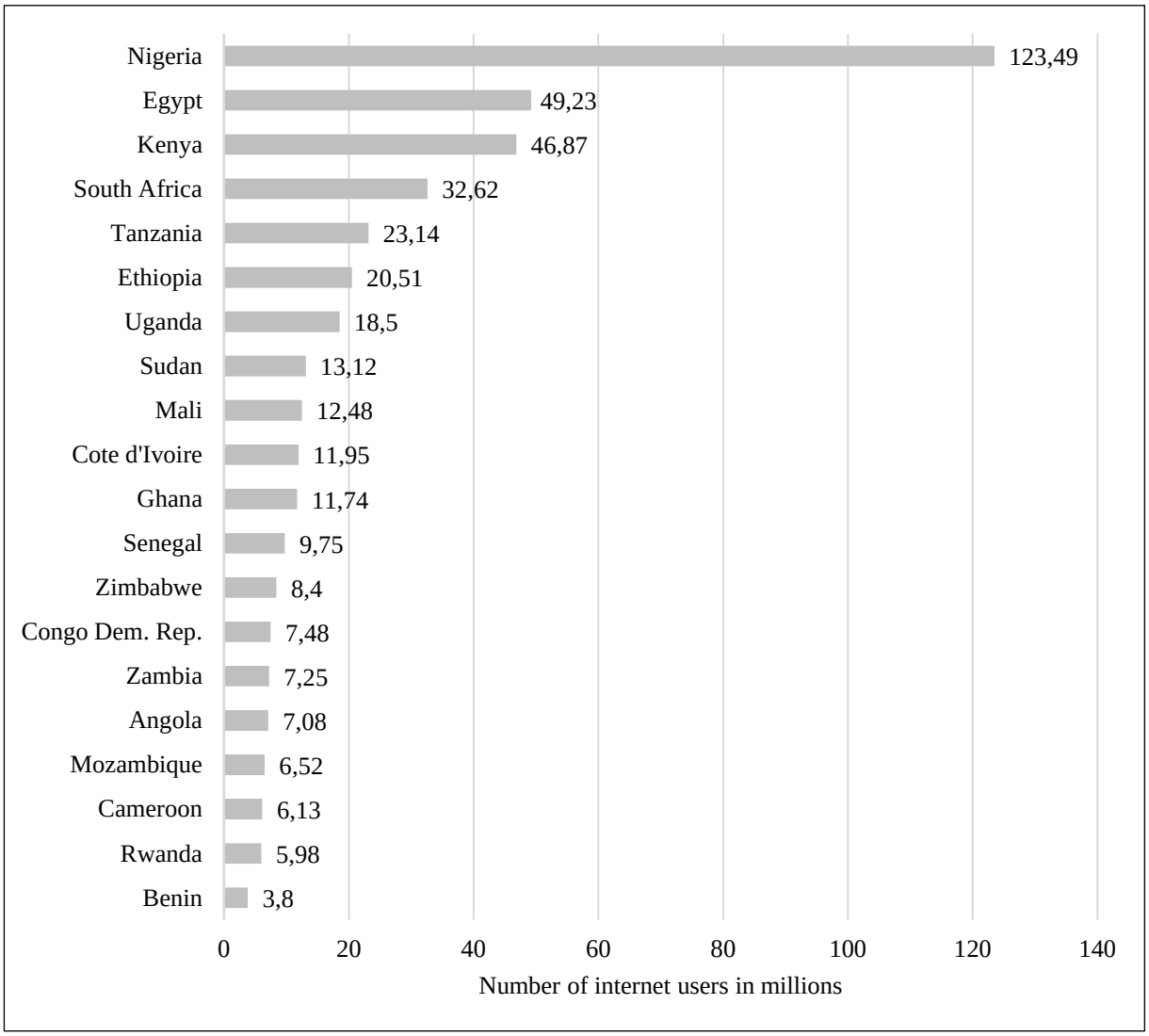
483 Cf. Gioia et al. (2013).
484 Cf. Strauss & Corbin (1998).
485 Cf. Eisenhardt & Graebner (2007), p. 29.
486 Cf. George et al. (2016), p. 377. See Appendix 8.
487 Cf. GSMA (2019), p. 2.
488 Cf. ibid.

Egypt (49 million users) is on the second and Kenya (47 million users) on the third rank, respectively. The number of mobile Internet subscribers in the region has quadrupled in the past ten years, as the technology is often the only available platform for most of the population to go online.[489] As a consequence, a large proportion of web traffic in leading digital markets in sub-Saharan Africa originates from mobile devices. In Nigeria, one of the countries with the most Internet users worldwide, 74% of web traffic was generated via smartphones and only 24% via personal computer (PC) devices. This is because mobile connections are priced at lower costs and do not require the expensive infrastructure that is typically required for traditional desktop PCs with fixed-line Internet connections.[490]

Figure 8: Number of Internet Users in Selected Countries in Africa as of June 2019



Source: Statista (2020b).

[489] Cf. GSMA (2018), p. 3.
[490] Cf. Statista (2020b).

With this rapid diffusion of mobile technology, mobile Internet has become the preferred platform for creating, distributing and consuming digital content and mobile services, including those that help address various social challenges in the region. For example, the emergence of "mobile money services"[491] has improved the lives of 400 million[492] people across Africa who had previously been locked out of the financial system and who now have access to an increasing array of financial services through a mobile infrastructure.[493] The expanding mobile money ecosystem offers new opportunities for productivity and provides efficiency gains to governments.

These opportunities of mobile-based innovations are increasingly attracting talent and investment to the tech startup ecosystem[494] in sub-Saharan Africa.[495] In the last decade, a growing wave of entrepreneurs has launched variety of web-based ventures, ranging from e-commerce sites and digital entertainment platforms to mobile health technologies and online educational content.[496]

Eventually, mobile operating systems, especially Apple's iOS and Google's Android for mobile devices, have put the power of computers in the hands of billions of people and have enabled millions of entrepreneurs and developers worldwide to create a range of new mobile service apps.[497] Developing mobile service innovations is particular attractive to local innovators due to substantially low development costs, if compared with developing physical products.[498]

Over time, business incubators, innovation and research labs, seed capital and startup competitions have become ubiquitous. A recent analysis found that there were 314 active tech hubs across Africa as of July 2016, whereby South Africa, Kenya and Nigeria account for the largest share of tech hubs in sub-Saharan Africa, but several other countries, such as Ghana,

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491 By the end of 2018, there were 395.7 million registered mobile money accounts in the region (GSMA (2019), p. 23).

492 The region is now served by more than 130 live mobile money services, many of them led by mobile operators, and a network of more than 1.4 million active agents (ibid, p. 3).

493 Cf. Barrett et al. (2015), p. 136.

494 Some 77 tech startups across the region raised just over $366.8 million in funding in 2016, growth of 33% compared to the previous year. Mobile operators also play a central role in the tech startup ecosystem through collaborative ventures with innovators and tech hubs, providing direct investments and access to key network APIs and distribution channels (GSMA (2017), p. 3).

495 Cf. ibid.

496 Cf. McKinsey (2013), p. 1.

497 For example, Uber started as a small team with a vision. They hired developers to write an app, first for iOS and then for the Android operating system. They then put those apps in app stores and made them available to people who used these mobile platforms.

498 Cf. Evans & Schmalensee (2016), p. 48.

Senegal and Uganda, now reached double figures in the number of active tech hubs.[499] Increasingly, large MNCs, such as IBM, Google, Cisco, GE, Siemens and Microsoft, are using emerging economies as testing grounds in which to develop, test and scale service innovations using digital technologies.[500]

Transportation Poverty in Africa. In many developing and emerging market countries, including African economies, governments often have inadequate resources for providing basic services, such as transportation, to society. This limited availability of public transport systems and road infrastructures creates critical challenges which hamper the socio-economic development of these countries.[501] Traffic congestion, for example, costs the city of Nairobi $1 billion a year in lost productivity.[502] Furthermore, in many African regions, road accidents are the third leading cause of death after malaria and HIV/AIDS.[503] A large part of society is also excluded from urban public transport because fares are often too high. Especially households with a low purchasing power[504] cannot afford a trip on a public bus. Walking, consequently, remains the main mode of transport (50%), followed by taxis (25%) and busses (7%). Private motorized transport is low,[505] as, for example, reflected in the motorization rates of 1% in Dakar and 6% in Dar es Salaam.[506]

The rapid urbanization, coupled with Africa's extraordinary population growth, puts additional pressures on the urban transport systems.[507] The share of urban residents has increased from 14% in 1950 to 40% in 2015, urbanizing twice as fast as Europe.[508] By 2035, half of Africa's one billion population is expected to live in urban areas, creating a rising demand for transportation. This growing urban population needs an adequate public transport infrastructure that relates to its travel needs and financial resources.[509] The development expert Glaeser argues

499 Cf. GSMA (2017), p. 29.
500 Cf. Barrett et al. (2015), p. 150.
501 See Appendix 14.
502 Cf. Ombok (2019).
503 Cf. The Economist (2015).
504 On average, lowest-income quintile households spend 30-50% of their disposable income on daily commutes a month (AfDB (2016), p. 176).
505 Countries with the highest car ownership per 1,000 people are Libya (297), the Seychelles (182), Mauritius (174), Botswana (168) and South Africa (165). Countries with the lowest are: Ethiopia (3.1), Togo (2.3), Sao Tome and Principe (2.2) and the Central African Republic (0.31) (ibid, pp. 176-177).
506 Cf. ibid, p. 176.
507 Cf. Baghudana & Leis (2015), pp. 10-11.
508 Cf. AfDB (2016), p. 146.
509 Cf. ibid, p. 176.

that new transportation services are necessary for socio-economic development, environmental sustainability and to avoid car dependency in the future.[510]

Travelling in the city by public busses is tedious, costly and dangerous,[511] while private motorization remains low.[512] As a result, the majority of the population is limited in their basic ability to move from A to B to efficiently manage their daily chores and to access relevant centers of economic activities,[513] such as schools, administrative agencies and work. Apart from the day-to-day difficulties that are created by an inadequate transport supply, a variety of studies on the links between poverty and transport show that factors which impede mobility also limit access to the necessary resources to escape poverty.[514] An experiment in Addis Abeba demonstrated that decreasing the transportation costs might increase the propensity and intensity of a person's job search, simultaneously decreasing the engagement in informal work and eventually increasing the probability of permanent employment.[515] Developing affordable and efficient mass transportation systems is essential to cost-effectively connect people to economic activities (e.g., jobs) and to increase a city's productivity.[516] In such countries, filling the gap between the two extremes, walking and private vehicle ownership and fostering these basic capabilities/services is, thus, expected to have greater salience than producing and selling goods (e.g., cars) that are unaffordable, even at low costs.

Governmental actions to improve the urban transport infrastructure[517] planning and regulation do not keep pace with the rising demand for transportation services. Projects for new roads, metro railway lines and new bus terminals in many countries have either not yet begun or have not yet made an impact. Likewise, also well-funded private initiatives struggle to improve the urban transport infrastructure.[518] Hence, the informal means often remain the backbone of a city's transport system.

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510 Cf. Glaeser (2012).
511 See Appendix 14.
512 Cf. Diaz Olvera et al. (2013), p. 56.
513 See Appendix 9.
514 Cf. Bryceson et al. (2003), p. 191; Salon & Gulyani (2010), p. 641; Lucas (2011), p. 1321.
515 Cf. Franklin (2018), p. 2353.
516 Cf. Diaz Olvera et al. (2013), p. 59; Baghudana & Leis (2015).
517 Infrastructure includes all main networks (systems of public facilities, sets of fixed assets or structures) that support economic and social activity, including those associated with water, power, sanitation, ICT, and transport (roads, railways, maritime, and air (AfDB (2018), p. 69). Yet, this study focuses explicitly on the transport sector.
518 Cf. Diaz Olvera et al. (2013), pp. 57-58; Baghudana & Leis (2015), p. 7.

These frictions in the transportation sector have portended opportunities for young tech entrepreneurs leveraging technology to build multi-sided digital platforms to create value by dissolving these dysfunctionalities.[519] The platforms aim at eliminating inefficiencies in the transportation sector as well as extending the reach of services to provide more choices to customers.[520] While the physical infrastructure challenges still exist (for example, poor road and rail networks and a lack of addressing systems), tech startups leverage digital platforms, such as mapping, GPS tracking and even basic SMS, to improve the transportation and logistics and to drive cost efficiencies.[521] In the following, the context specificities of the three cities under investigation are presented.[522]

Nairobi. Nairobi, Kenya's capital, is a rapidly growing city with an estimated population of 4,39 million inhabitants. With Kenya's rapid urbanization rate of approximately 4.36% per annum, 75% of newcomers to the city are expected to live in informal settlements, such as Kibera that lack many basic infrastructure services and amenities. This may contribute to increase the levels of inequality between those who can afford to live in serviced areas and those who cannot. Nairobi's residents typically use a combination of walking and minibuses (locally referred to as 'matatus') to get around the city. Although matatus[523] form the backbone of public transport, journey times are often long and unpredictable, and commuters are exposed to several hazards. A reliable, affordable integrated public transport and non-motorized transport (NMT) network that is safe and accessible to all income groups could substantially improve Nairobi's transport sector. New initiatives, such as the Mobility Accelerator, aim to support youth startups that offer transformative, practical and well tested solutions to urban mobility challenges, with the aim of improving the commuting experience in African cities.[524]

Today, most people walk out of necessity due to the prohibitive cost of other modes of transport. Especially, the urban poor actually do not have one travel option to choose from. They walk practically everywhere they go, sometimes for long distances.[525] The city has very few

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519 Note: Of course, digital service innovation will not solve all issues in transportation. African economies also have to solve larger infrastructure problems. For instance, landlocked countries need to focus on road infrastructure, because it also determines the affordability of other infrastructure projects.

520 Cf. GSMA (2019), p. 3.

521 Cf. ibid, p. 28.

522 Note: The text was almost sourced unchanged from the Transportation and Urban Mobility Initiative (TUMI) website.

523 Matatus are 14- to 28-seater minibuses that are Nairobi's main form of public transport – similar to the danfos of Nigeria.

524 Cf. Robinson (2019), p. 1.

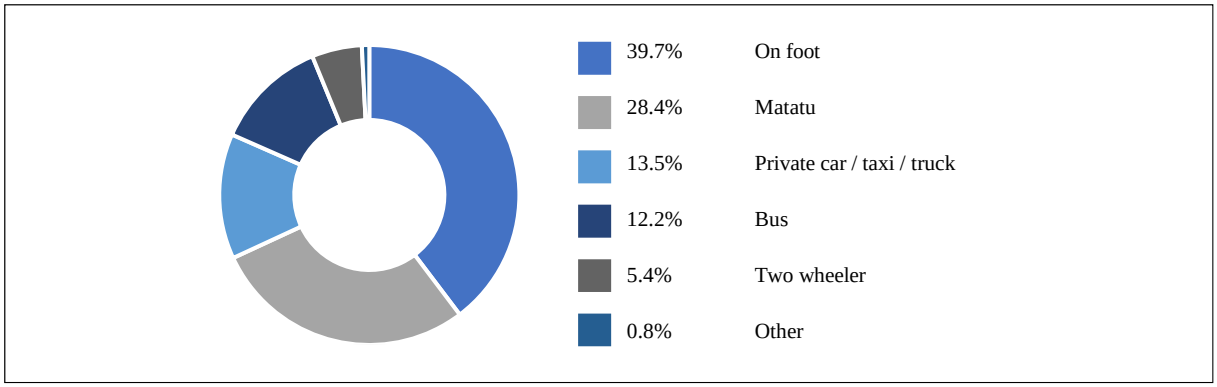
525 Cf. Salon & Gulyani (2010), p. 641.

sidewalks or other NMT facilities, which means that pedestrians and cyclists risk their health and safety by sharing the road with motorized vehicles. In 2014, 723 people died on Nairobi's roads, and of these, 70% were pedestrians.[526] There is also a lack of capacity within the city to design good NMT facilities and transport solutions, and European consultants have recently been hired to develop NMT Design Guidelines for it.[527]

Nairobi's bus system functioned well for six decades until the mid-1990s, when it collapsed. In the absence of public bus and rail services for longer distances, around 28.4% of the city's population use its estimated 20,000 matatus for their daily commute. Although matatus drive dangerously and are often unsafe options for passengers and other road users, they have become the most popular mode of public transport as they cut corners and often transport passengers to their destinations quicker than other modes of transport. There is significant room for improving the current transport system in terms of network coverage and provision of dedicated facilities, but a lack of cooperation between government and matatu drivers stands in the way of improving the commuter experience. Compounding the problem is the rapid growth in the use of 'boda boda' motorcycle taxis, which weave dangerously between moving vehicles.[528] Figure 9 displays the proportions of different transport modes in Nairobi.

There has also been an increase in car ownership rates and worsening traffic congestion, particularly during peak hours. Kenya's growing middle class view private cars as status symbols. The trend towards the use of private cars threatens to move Nairobi in an unsustainable

Figure 9: Modal Split Nairobi



Source: Adapted from Robinson (2019), p. 1.

526 Cf. Robinson (2019), p. 2.
527 Cf. ibid.
528 Cf. ibid.

direction unless something is done to make public transport and other transport solutions more user-friendly.

Nairobi is planning a 103-kilometer-long rapid transit network comprising five lines. Phase one will be implemented between 2018-2030 and will focus on bus rapid transit as a medium-term solution. Phase two will add a railbased mass rapid transit system (MRTS) after 2030. The Nairobi Metropolitan Area Transport Authority (NAMATA) has been established to provide institutional support and coordinate Nairobi's wider public transport plans.[529] Nairobi is also considered as the leading regional hub for information and communication technology and transportation services.[530]

***Lagos*.** With a metropolitan population approaching 23 million that is growing at a rate of 6% per annum, Lagos will soon be one of the largest cities in the world. Although it is the economic engine of Nigeria, its potential is being stifled by poor transport systems that make living and working in it difficult.[531] In 2000, Lagos had a population estimated at over 10 million, the transport infrastructure and services, however, were at levels that supported a population of no more than six million. With the establishment of the Lagos Metropolitan Area Transport Authority (LAMATA) the transport system should be reformed. Indeed, LAMATA has been empowered to create a world-class intermodal integrated transport system for the emerging megacity, with close to 20 million trips made daily in the city.[532]

While some progress has been made in improving public transport, the current network is still limited in its capacities. Most residents still rely on the thousands of yellow mini-buses that ply the streets. There is limited infrastructure for commuting on foot or by bicycle, and a significant portion of the population is exposed to daily danger by sharing the road with motorized vehicles. These limited options combined with the severe infrastructural bottlenecks (e.g., congestion), make commuting in Lagos a slow, unreliable and expensive endeavor. Indeed, Lagos' transport system is dominated by informal operators, with residents relying heavily on a combination of 'danfos' (minibus taxis), 'kekes' (three-wheelers) and 'okadas' (motorcycle taxis) for 45% of their journeys around the city. It is estimated that 70% of motorized trips use these modes as opposed to private vehicles or formal public transport. Principally, the informal sector is composed of individuals owning one or two second-hand vehicles, that they rent out to drivers

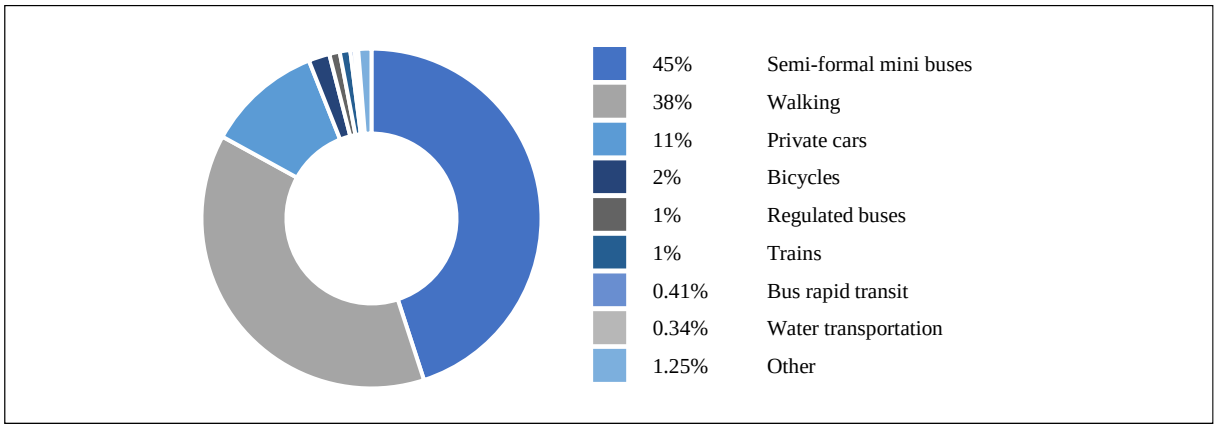
529 Cf. Robinson (2019), p. 2.
530 Cf. AfDB (2018), p. 150.
531 Cf. Gorham et al. (2017).
532 Cf. LAMATA (2020).

on a daily basis. It is estimated that 75,000 minibuses are on the streets. Some commuters travel on buses regulated by LAMATA, but these are not nearly as popular as the informal options.[533] Figure 10 illustrates the proportions of different transport modes in Lagos.

Non-motorized modes are estimated to constitute over 40% of all trips in the city, but this is often a dangerous option for commuters. Many public streets in Lagos are used by a mix of motorized and non-motorized vehicles, with a wide range of dimensions, speeds and acceleration capabilities. As a result, vehicle behavior is erratic and difficult to manage, and in most cases pedestrians and cyclists have no choice but to share the carriageway with fast moving vehicles. As income levels rise, many Lagos residents choose to buy their own cars, and an estimated 11% of commutes are now performed via private vehicles. The effects of this are seen in growing traffic congestion, high rates of traffic-related injuries and deaths, and worsening noise and air pollution.[534]

In an effort to improve mobility in Lagos, the government has intervened strategically in a number of areas. In 2002, the Lagos Urban Transport Project (LUTP) was launched to revamp and modernize public transport through improved bus operations, institutional reform and road rehabilitation. A 22 kilometers dedicated bus corridor known as the "BRT Lite" was introduced in 2008. The BRT (Bus Rapid Transit) is a transport option based on free segregated lanes to guarantee fast and reliable bus travel. The corridor transports an average of 120,000 passengers per day in 220 buses, and there is significant potential for expansion to connect it to different

Figure 10: Modal Split Lagos



Source: Adapted from Fisher & Robinson (2019), p. 1.

533 Cf. Fisher & Robinson (2019), p. 2.
534 Cf. ibid.

parts of the city so that more low and middle-income residents can access it.[535] An urban rail system is currently under construction and will eventually consist of seven lines. Following significant delays, Phase one is scheduled to open in the next five years.[536]

Kigali. Kigali, the capital of Rwanda, has an urban population of 1.13 million people and its annual growth rate is 4%, making it one of the most densely populated cities in Africa. As Kigali's city is urbanizing rapidly it faces challenges ranging from congestion, pollution and deteriorating infrastructure, among others.[537] The lack of efficient transport solutions can be a barrier not only to economic development but also to the entire urbanization process. Rwanda has made urbanization a key pillar of its transformation agenda and therefore makes efforts to improve the road network, reduce traffic congestion and integrate public transport systems.

The city of one million people, in the mountainous center of the small, landlocked nation,[538] has made major transformational changes over the past decade. Regulated moto taxis and a city bus system were improved further with the 2016 Smart Kigali initiative, and there are car-free Sundays twice every month. In the case of Rwanda, road transport is the dominant mode. The main form of public transportation in Kigali is the minibus system, which runs both scheduled and unscheduled services.[539] Road-based passenger transport services are provided by both the private sector and a public company called Office National des Transports Commune (ONATRACOM). Individual operators and 41 companies including ONATRACOM provide capacity for 72,264 passengers for transport services in Rwanda. Out of the total supply capacity, individual operators are the dominant providing 70% of the total seat capacity. ONATRACOM serves Kigali (about 15% of services), major provincial towns (57%) and rural routes (28%). In principle, ONATRACOM has the obligation of serving routes that are unattractive to the private sector providers and often withdraws from those that are over-supplied with private sector operators. Both services, however, share some characteristics, such as operating without timetables, running uncoordinated services and having no prescribed

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535 Special bus lanes are being planned for Kenyan capital Nairobi. A loan worth US$59 million from the Export-Import Bank of Korea in South Korea will help pay for the work. The new bus lanes are intended to help reduce Nairobi's chronic traffic congestion. These will be dedicated lanes for the use of high capacity buses only (Woof (2020)).

536 Cf. Fisher & Robinson (2019), p. 2.

537 Cf. Urban Pathways (2020).

538 Cf. Kuteesa (2019).

539 Cf. Nsengiyera et al. (2018), p. 99.

passenger service levels. However, just like in rural areas, the scattered settlement pattern of the urban population makes provision of high occupancy mass transport difficult.[540]

In the past years, the minibuses were phased out in many areas of the city in favor of larger buses, some of which have integrated cashless payment through a “Tap & Go” card and online bookings. Motorcycle taxis are also a prominent transportation option with an estimated twenty to thirty thousand vehicles operating on the roads of Kigali. The city also plans to replace the fleet of petrol-powered motorcycles by electro bikes. The aim is to provide a low cost and environmentally friendly mode of transport, mainly for motorcycle taxi riders. New digital services, including online booking and metering, have been rolled out for both motorcycles and taxis in recent years, such as Yego Moto. Furthermore, the German car manufacturer Volkswagen has recently introduced the community car-sharing service Move Ride and installed an assembly plant in Kigali.[541] This investor-friendly environment in Kigali is increasingly attracting players to develop new solutions in mobility.

4.3.3 Case Selection Procedure

The selection of an adequate set of cases is an important step in the process of building theory from case studies. In multiple-case study research, cases are sampled based upon their likelihood that they will provide theoretical insight. This means that cases are selected because they are appropriate for illuminating and extending relationships among constructs.[542] This contrasts statistical sampling, where researchers randomly select the sample from the population.[543] Yin differentiates between two case selection strategies: cases may be chosen so that either similar results are achieved as predicted (literal replication) or that results are achieved that are different for predictable reasons (theoretical replication).[544] Adding new cases can be stopped at a point where the theoretical saturation is reached, meaning that only incremental insights are gained from new case material.[545]

Yet, identifying a set of eligible case candidates and capturing the innovators’ activities, especially how they develop and implement innovation in these economies, has been complex and challenging due to the scarcity of information and databases. In the geographical spheres

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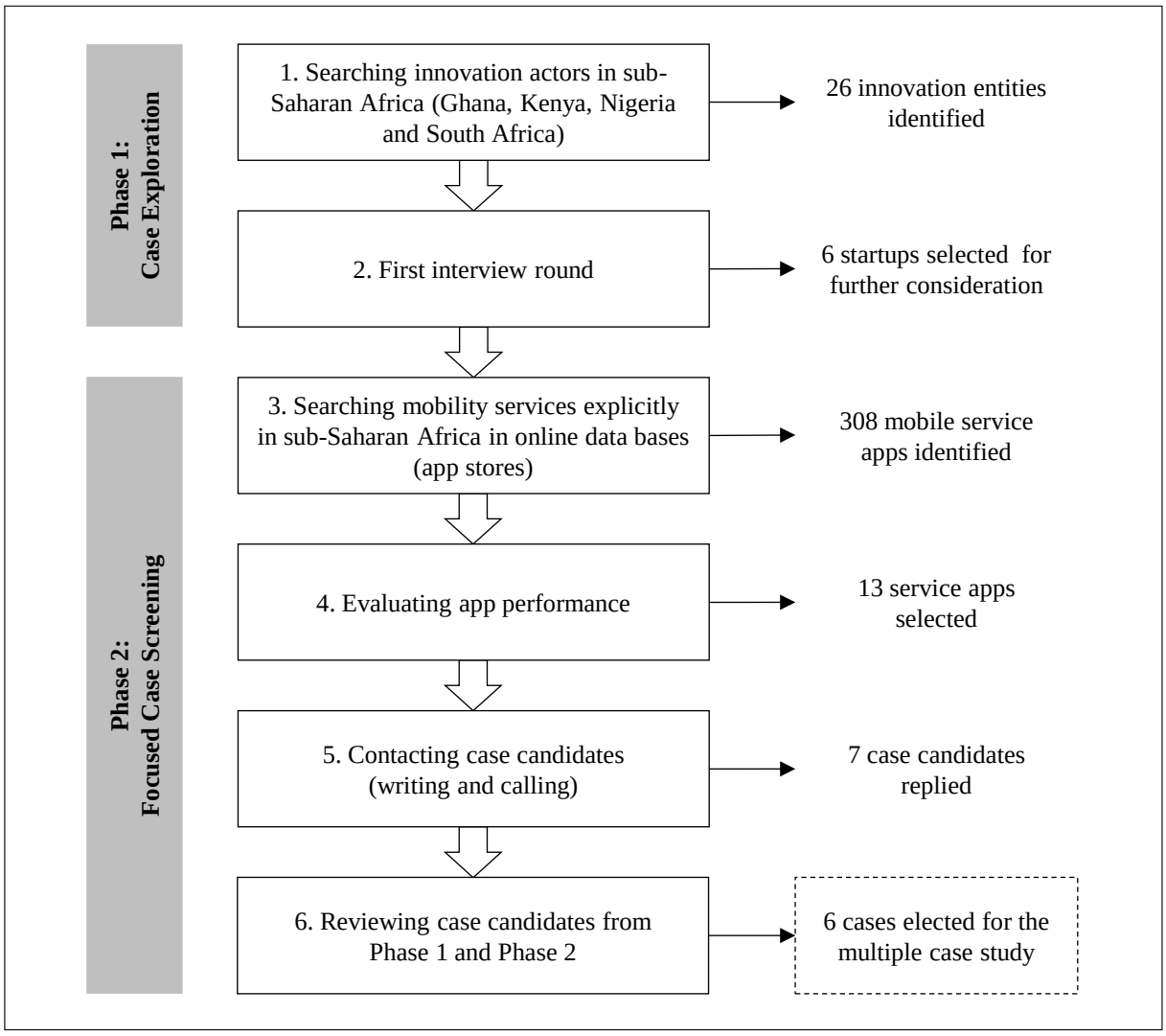
[540] Cf. Nsengiyera et al. (2018), p. 100.
[541] Cf. Volkswagen (2018).
[542] Cf. Eisenhardt & Graebner (2007), p. 27.
[543] Cf. Eisenhardt (1989), p. 537.
[544] Cf. Yin (2014), p. 57.
[545] Cf. Glaser & Strauss (1967), p. 61.

of sub-Saharan Africa, innovation is essentially ‘invisible’ in terms of conventional indicators and requires an extensive search. Accessing and investigating the phenomenon of interest was additionally made difficult by the geographical distance. Given these difficulties in data access and availability with regards to digital innovation projects in the transportation sector at the outset of this study in 2014, a two-phase selection process was performed (Figure 11).

Figure 11: Case Selection Process



Source: Own illustration.

Phase 1: Exploring the Innovation Ecosystem. The first step involved exploring the local innovation ecosystems to spot eligible case candidates. To do so, various sources of data, including media articles, corporate initiatives, magazines, websites on regional startup competitions, local accelerator programs and incubators as well as corresponding YouTube videos were reviewed to identify possible candidates. This procedure yielded a list of 40 different innovation entities, including eight tech startups and four MNCs which were contacted by writing and via telephone.

As displayed in Table 3, from this initial list, semi-structured interviews with 26 different innovation entities in sub-Saharan Africa were conducted to gather information on the local innovation ecosystem, the major innovation actors, relevant collaborations among firms, the digital readiness of the market and an assessment of local challenges and opportunities. Also, the snowball technique was harnessed and all informants were asked to suggest further innovation-active firms (first selection criterion) in the transportation sector. This first case selection criterion implied that the cases needed to report on one or more innovations within the observation period, or at least needed to be innovation-active, i.e., being engaged in one or

Table 3: Exploration of Case Candidates

No.	Company Name	Country	Position	Category
1	iHub	Kenya	PR & Communication Manager	Incubator
2	idea Hub	Nigeria	Center Manager	Incubator
3	R-Labs	South Africa	Founder	Incubator
4	Seedstars World	Nigeria	CEO	Incubator/Accelerator
5	CCHub	Nigeria	Co-Founder	Incubator
6	m-Lab	Kenya	Manager	Incubator
7	Code for Ghana	Ghana	Director	Tech Lab
8	Wennovation Hub	Nigeria	Director	Incubator
9	Afrilabs	Nigeria	Director	Innovation network
10	Nairobi Garage	Kenya	Founder	Investor/Accelerator Program
11	L5Lab	Nigeria	Founder	Investor/Accelerator Program
12	NEST	Kenya	Manager	Investor/Accelerator Program
13	Samsung	Nigeria	Manager	MNC
14	Philips	Kenya	Vice President, Innovation Manager	MNC
15	Volkswagen SA	South Africa	Manager	MNC
16	IBM	Kenya	Innovation Project Leader	MNC
17	E-Pump	Nigeria	Founder	Startup
18	GoMyWay	Nigeria	Founder	Startup
19	Jekalo	Nigeria	Founder	Startup
20	Maramoja	Kenya	Founder & CTO	Startup
21	Kibo	Kenya	Founder	Startup
22	Zapacab	South Africa	Founder	Startup
23	UBER	Nigeria	General Manager	Startup
24	Giditraffic	Nigeria	Founder	Startup
25	University of Cape Town	South Africa	Professor	Academia
26	University of Nairobi	Kenya	Proffessor	Academia

Source: Own illustration.

more activities to develop or implement new or improved solutions for an intended use.[546] This study, thus, excluded conventional actors in the transportation ecosystem.

This explorative phase was insightful because it revealed that a growing number of corporate IT-firms was tapping into the market at the time of investigation, yet, rather focused on establishing collaborations with local universities or pursued corporate social responsibility-led initiatives (CSR), such as educating local students in IT skills by providing workshops in coding, teaching programming skills on proprietary IT platforms and implementing CSR-led projects. As the major goal of this study was to trace innovation activities that are necessary to develop and implement a digitally enabled service innovation in these resource-constrained environments, the focus shifted to the examination of local startups, which were committed to developing new services or have already implemented a service in the market. In the end, six startups remained for further consideration.

Phase 2: Identifying Eligible Case Candidates. The second phase had a narrow focus and involved a thorough screening of mobile service apps in the transportation sector. To identify additional candidates, the author looked at different mobile app ranking sites and reviewed apps in the Android and Apple app stores by using ‘mobility’ and ‘transportation’ as key search terms.[547] These sources together generated a list of 308 mobile service apps in five sub-Saharan African economies. As illustrated in Figure 12, the identified mobile services were sub-divided into five major business categories (business transportation, private transportation, education and networking, purchase and after sales, information and navigation).

Considering the inadequate supply of transportation services in African economies, the focus was on those categories and cases that were found to have the capacity to provide a substantial improvement to transportation. Hence, the review was narrowed down to three business categories: business transportation, private transportation and information and navigation services that were considered relevant, while eliminating information services (e.g., point of interest finders, sightseeing, flight info, infotainment, hotel-booking apps and flight-related apps) that did not address these issues. After reviewing some quantitative figures (e.g., number of downloads, Facebook followers, likes, overall customer rating, etc.) to evaluate the app performance, the screening resulted in a list of 13 interesting candidates.

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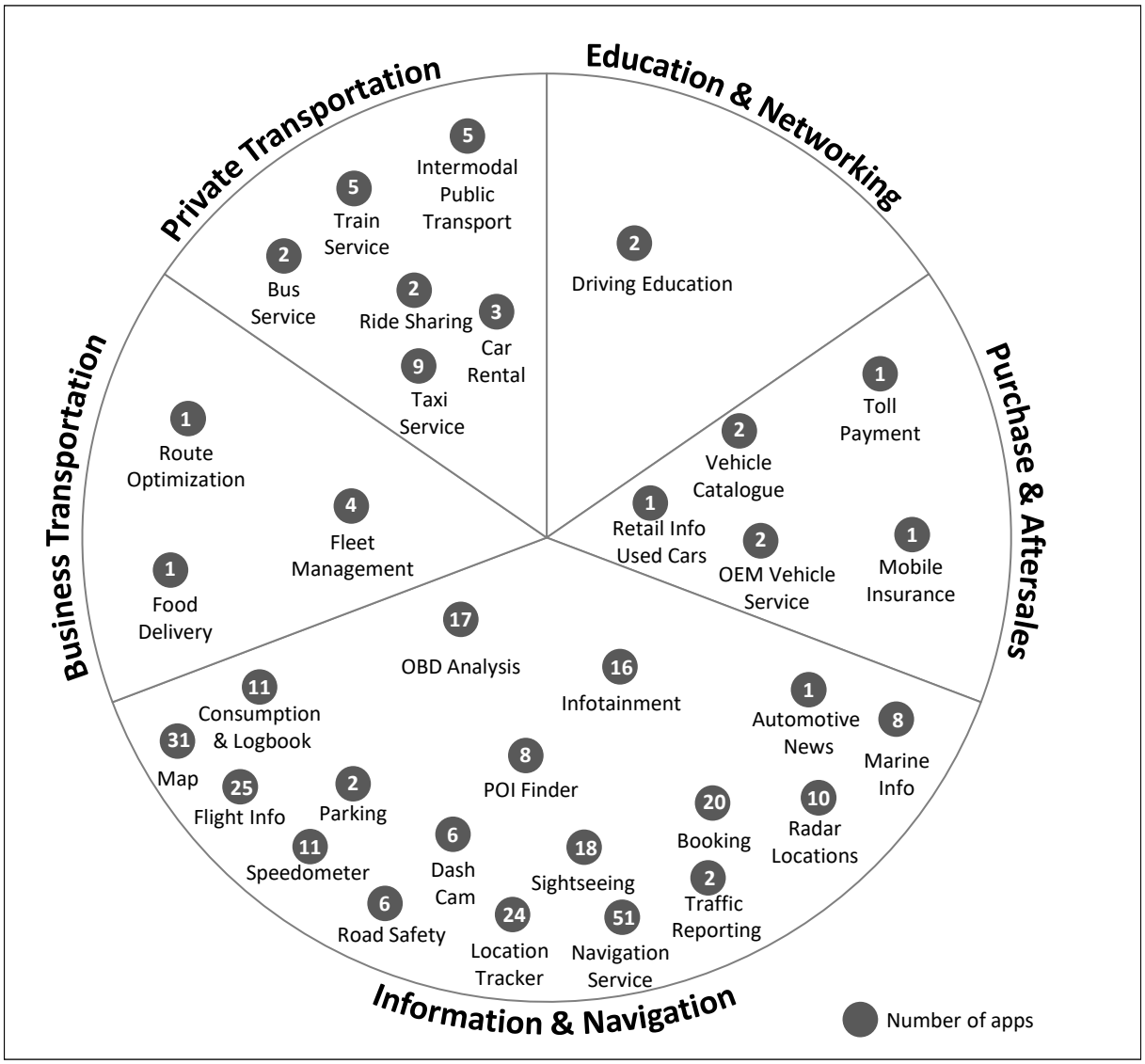
[546] Cf. OECD & Eurostat (2018), p. 34.

[547] Categories were not always consistent, therefore, automotive and logistics were included as key search words.

Figure 12: Categories of Identified Mobile Services in Sub-Saharan Africa



Source: Own illustration.

The author attempted to contact these candidates both in writing and by telephone and obtained initial information on seven. Each of the seven candidates submitted written material and reports about their current activities. From Phase 2, three candidates were selected based on the availability of documented data and the accessibility of the site. In addition, re-reviewing the six cases from Phase 1, three startups were chosen. Altogether, six cases were eventually selected for the multiple-case study (Figure 11), as they were found to best fit the literal replication logic and provide rich insights in the complexity of the innovation activities in emerging markets.

To sum up, the case candidates were theoretically sampled based on two criteria: First, the cases needed to represent innovative firms. This implies that they could report one or more innovation(s) within the observation period, or they were at least innovation-active. Second, the

innovation had to refer to a new or an improved service offering in the local market, which had already been implemented, and, thus, made available to potential users (e.g., by being available at the Android or Apple App Store).

4.3.4 Presentation of the Six Main Cases Under Investigation

This section profiles those entrepreneurial firms that leveraged digital technology to reverse the trend of inconvenient, unreliable and untrustworthy transportation services. The startups had been founded between six and 24 months prior to the investigation. While most startups were yet to break even, they were confident to achieve scale and sustainability. Interviewees said that the transportation services market was exciting and dynamic, and that they were enthusiastic about the new opportunities provided by mobile technology. They saw an immense business potential in applying technology to the dysfunctionalities in the local transportation sector. Furthermore, they expected great potential for the implementation of Western inspired digital transport solutions into the local market. A majority of startup teams, four of six encountered in this study, had a mix of Africans and non-Africans working together. Table 4 provides an overview of the studied cases.

Trust Taxi. The first company selected is Trust Taxi. It developed a socially powered taxi app, built to tackle specific transportation challenges in African cities. The company behind Trust Taxi is a machine-learning startup with proprietary innovations (patents pending in Kenya and the USA) in the field of trust recommendations. The startup uses these trust recommendations to power the taxi app in Nairobi and franchises across Africa. Founded in 2013 as a Kenyan Limited Liability Company, it sought to be the next transport solution for Africa. The founder's main idea was to bring technology to the blossoming Nairobi tech scene because nothing was happening regarding transportation.

Trust Taxi, however, quickly realized that interpersonal trust was at the center of most taxi transactions and began changing its concept – ultimately arriving at a socially powered taxi app that leveraged the users' and the drivers' data and personal networks to give users the ability to choose the taxi they prefer and meaningful data points to make those choices. The app is deeply rooted in Nairobi's unique taxi culture, highlighting values, such as trust, relationships, referrals and loyalty. To ease the impact of inefficient transportation and logistics across Africa, Trust Taxi digitally replicated existing cultural models for accessing transport via trusted connections, thus serving as an honest broker, an aggregator and a value-added platform.

Table 4: Presentation of Selected Cases

	Trust Taxi	Motorcycle Taxi	Delivery Service	Shuttle Service	Inter-City Carpooling	Intra-City Carpooling
Category	Logistics, Transportation	Public Safety, Taxi Service, Transportation	Logistics, Goods Delivery	Transportation, Bus-Hailing	Transportation, Ride Sharing (short-distance rides)	Transportation, Ride Sharing (long-distance rides)
Founded Date	2013	2014	2014	2015	2015	2015
Operating Status	Active	Active	Active	Active	Non-Active*	Active
Funding Status	Seed	Seed	Early Stage Venture	Seed	Seed	Seed
Number of Employees	14	15	20	7	5	5
IPO Status	Private	Private	Private	Private	Private	Private
Company Type	For Profit	For Profit	For Profit	For Profit	For Profit	For Profit
Description	Taxi Service is a socially powered taxi app that leverages users' and drivers' data and personal networks to give users the ability to choose the taxi they prefer, and meaningful data points to make those choices.	Motorcycle Taxi Service is a ride hailing and on-demand services platform. It allows customers to order safe and professional 'motos' directly to their desired pickup locations.	Delivery Service offers on-demand door-to-door delivery services of different sizes.	Shuttle Service is a reliable, affordable and comfortable pre-booked shuttle service launched.	Inter-City Carpooling is a ride-sharing marketplace connecting passengers with ride owners going along the same route and who have empty seats to share.	Intra-City Carpooling is an online platform where ride-owners can share a ride with someone going along the same route.

* Non-active since 2017

Source: Own illustration.

Motorcycle Taxi. Motorcycle Taxi is a ride-hailing and on-demand service platform for motorcycle transportations, one of the most popular forms of urban transit in the region. It is specifically designed for urban African travelers. As Kigali and other African cities undergo a population boom, so too does the demand for getting around cities in a way that is safe and efficient and makes sense to Africa. Recognizing this need, two business partners founded Motorcycle Taxi in 2015. The startup's smartphone app allows customers to order safe and professional 'motos' directly to their desired pickup locations, as opposed to hailing them down on the streets. It also employs vehicle telematics to track drivers and to register data. Motorcycle Taxi consolidates multiple, on-demand services in one smartphone app with services linked to a common physical logistics network of motorcycles and drivers. Customers can easily pay from their Motorcycle Taxi wallet, which can be connected to mobile money, cash and credit cards with affordable prices determined by the driven distance.

More than just a ride-sharing service, Motorcycle Taxi's value proposition is to deliver safe transportation by monitoring its fleet of drivers in real-time. Drivers, thus, are required to have at least three years of experience before joining Motorcycle Taxi.

Delivery Service. Delivery Service provides a mobile app and web platform that enable individuals and small businesses to connect with drivers and provides on-demand mobile-based delivery services 24/7. Delivery Service connects customers with drivers to help deliver goods effortlessly and transparently. Customers can place orders through the Delivery Service platform, and Delivery Service dispatches these orders in real time to available Delivery Service drivers.

The business to business (B2B) platform was established in 2014 to enable businesses of all types and sizes to transport goods more efficiently across East Africa. Its cutting-edge technology offers an efficient capacity utilization and transparent pricing to a sector that has previously been regarded as beyond change. A poor infrastructure, a limited use of technology, an inefficient capacity utilization and a lack of pricing transparency in the region all contribute to the largely inflated prices of foods, basic items and health services. With a reduction in logistics costs for local manufacturers and small businesses, spillover social benefits of the platform include reduced product prices and more widely affordable goods. It also serves as a stable source of income for drivers on the platform.

Over time, Delivery Service has been able to aggregate a pool of various delivery vehicles from motorcycles, pickups to vans and 3- to 28-ton trucks. It provides a web and mobile app platform

to link customers, who have delivery needs, with certified transporters. The customers select their vehicle of choice, get their price quote upfront and pay using multiple pre- or post-pay options. Delivery Service's mission is to change the lives of everyone: from patients who rely on regular drugs at the local pharmacy to farmers who urgently need to move their products to silos. Since its foundation in 2014, it has been used by around 4,000 businesses and 50,000 individuals for delivering a broad array of goods. Delivery Service, with 700 drivers on its platform, has completed over 180,000 deliveries between 2016 and 2018, with the startup posting revenues of $1.5 million in 2019.

Bus Shuttle. The company behind Bus Shuttle is a data and technology firm, founded in 2015, which developed diverse services. Its flagship service, a bus shuttle, is a reliable, affordable and comfortable pre-booked shuttle service. The aim is to build a mobility network which transforms the 'broken public transport system' in major cities across Africa, starting with Nairobi. The plan is to orchestrate daily commutes for thousands of city residents using the Mobility Operating Platform (MOP) that keeps the public transport sector moving through a variety of functions. These include demand aggregation, supply consistency, service scheduling, promotion, matching, notifications, tracking, inventory standardization, route pricing, payments, quality of service, reviews and compliance, all of which enable a safe, efficient and reliable mass transit platform assuring security of movement for people at a working-class level and at the BoP. Their edge is that they combine big data and local knowledge on business operations with their culture to build compelling transit experiences delivering value for commute customers, service partners and investors. In other words, Bus Shuttle is a mobility-as-a-service platform using data, artificial intelligence (AI) and machine learning to add value to the transportation ecosystems in cities across Africa.

It calculates routes based on demand and activates entire neighborhoods, estates and business districts to offer point-to-point connections, where possible, in spacious, comfortable, WiFi-enabled buses, optimizing schedules and routes to deliver unprecedented value to their commuter consumers and partners. The platform is accessible on the mobile web, mobile apps, the web, unstructured supplementary service data (USSD) and SMS that transit vehicle owners can use to exactly track the performance of their deployed vehicles in terms of payments and bookings done by commuters, driver analytics and behavior patterns as well as vehicle diagnostics to preempt and mitigate servicing and repair downtimes that would have an impact on the revenue.

Inter-City Carpooling. Inter-City Carpooling is a ride-sharing marketplace connecting passengers with ride owners using the same route that have empty seats to share the cost of long car journeys. Furthermore, as transportation services are in scarce supply, the idea was to extent the portfolio of local service options. Founded in 2015, Inter-City Carpooling is positioned for a nationwide spread via city-to-city travels.

The service targets both solo drivers that want to cover some of their costs or that want to have some company along their journey, and passengers that want to save costs or that have no means for transportation. The trips typically range from distances of 50km to 750km.

Co-travelers pay an agreed contribution to ride owners that will help cover some of the rider's travel expenses (e.g., fuel costs). Beyond significantly reducing the travel costs for both parties (whether as a passenger or a ride owner), another benefit is the social contact and the opportunity to make new friends or meet potential business partners, while conveniently arriving at the destination. Placing different verification levels for all members and a dedicated support team to monitor the activities on the platform were vital to the creation of a safety and a minimum level of trust in the Inter-City Carpooling community. Inter-City Carpooling is based on the idea that traveling should be cheap, fun and safe. In addition, the service significantly contributes to protecting the environment. In sum, the founders were inspired to build an online platform that should make long-distance rides affordable, social and efficient.

Intra-City Carpooling. Intra-City Carpooling is an online platform where ride-owners can share a ride with someone using the same route within one city. It aims at becoming a convenient and affordable service for intra-city trips and commuters. For riders, the service can be up to 90 percent cheaper than a typical taxi.

The service can be accessed through mobile and desktop browsers. Users can register and set up an account through the firm's website. The system works based on the trip information, which passengers and ride owners enter in the platforms, and then it matches the ride owners with those seeking a ride. The passenger either joins an already displayed ride that matches the requested route or gets notified as soon as a ride for his/her requested route is entered in the system. The cost of the ride is calculated in advance and the passenger is notified once the ride owner confirmed the request. The rating and review system allows users to view and assess their potential ride-share partners before accepting a journey. Intra-City Carpooling admins check all rides before they are published on the platform. Once the ride offer is published, the ride owner starts receiving ride request notifications from users for him/her to accept. Ride

owners earn points that can be used to redeem cash, fuel vouchers, airtime vouchers, mobile data and more. The firm generates revenues, by taking a commission fee from every payment.

4.4 Data Collection

As mentioned above, innovation in sub-Saharan Africa is an obscured phenomenon and is rather hidden. Collecting data on these 'below-the-radar' innovation activities, thus, is a strenuous, time-consuming and complex effort because the phenomenon of interest is not easily accessible for an instantaneous observation. Two moves were vital to shed light on them. First, this study adopted a telescopic perspective by exploring the local innovation context, its key innovation actors and examples of digitally enabled solutions. Second, this study used a microscope perspective to examine the local tech startups, more specifically, the activities they performed, how these activities related to the constraints in the local context and how they designed the value proposition. By doing so, this study collected longitudinal data, which helped to gather a varied sample of activities, challenging situations and examples for how these startups organized the service development process. This was complemented by visits of the local research sites, various observations to augment the data quality and the collection of documentary data. These steps were helpful to capture how the startups worked towards developing and implementing the new services.

This study draws on an extensive data set, which was collected over three years to compose a well-selected set of cases and to provide deep insights in the practices of tech startups in the context of emerging markets. In 2015, the few secondary data sources, including reports and articles, were used to explore the research field and to identify the key actors of the innovation ecosystem, including incubators, venture capitalists, corporate firms, startups, non-governmental organizations and international institutions. The main fieldwork occurred in two distinct phases from November 2015 until May 2016 and from February 2018 until December 2018. During these two phases, the author visited the research sites, tested the services, took part in workshops and attended international startup conferences, where the startups of interest presented and discussed their solutions with the audience.

The author pursued an iterative process of data collection, with the data collection and the analysis going hand in hand. As patterns emerged from the data, she also sought clarification and approached the firms again. A collegial atmosphere developed over time, which allowed to move back and forth between the data and the research sites as required. Some respondents were interviewed several times to clarify emergent concepts during the data collection process.

While multiple data sources were employed, including documents, field observations, media documentations and artefacts, the heart of the study were the semi-structured interviews to obtain retrospective and real-time accounts. This can be termed a genuine "research as engagement"[548]. The reliability and integrity of the data increased by combining and triangulating these sources.[549]

Interviews. This study employed interviews as primary method for data collection. During the explorative phase in 2015, the author conducted 26 Skype interviews with respondents from diverse innovation entities located in four African economies (Ghana, Kenya, Nigeria and South Africa) by applying a semi-structured interview technique. The sample questions which were used as guidelines for conducting the interviews with these initial respondents can be found in Appendix 10. These interviews were explorative in nature to gain first impressions of the local innovation context, including local challenges and emergent opportunities. They were designed to understand the goals, motivations and current innovation projects of these local innovation entities. After having gathered first responses, further information was exchanged via e-mail. The second interview phase focused on a selected set of local startups as the key innovation actors and can be sub-divided into two interview phases.[550] The first lasted from November 2015 until February 2016, while the second lasted from October 2018 until November 2018. During this time, the author could build a collegial relationship and a trusting rapport with the informants. In sum, she conducted 40 interviews with 16 informants of these six firms, whereas some respondents (especially the CEOs) were interviewed multiple times (Table 5). The CEOs were interviewed first. They then identified additional interviewees in their firms, especially the firms' chief technical officers (CTOs) as well as other employees, such as marketing managers, UX managers and on-the-street agents. If possible, interviews were also conducted with local partners, especially the drivers. Furthermore, venture capitalists and diverse innovation managers that worked with the startups were interviewed to triangulate insights from different sources.

The interviews were conducted both via telephone and face-to-face during the site visits.[551] They lasted between 60-120 minutes. The semi-structured interviews started with a question about the local context the interviewee operated in and continued with questions on the role of

548 Morgan (1983), pp. 11-13.
549 Cf. Yin (2014), p. 121.
550 See Appendix 11.
551 The site visits also generated two new case study leads.

Table 5: Interviews Conducted

	Interviews				
Case	CEO	CTO	Employee	Total Interviews	Total Interviewees
Trust Taxi	5	2	1	8	3
Motorcycle Taxi	5	2	2	9	3
Delivery Service	3	2	1	6	3
Shuttle Service	4	2	0	6	2
Inter-City Carpooling	2	1	0	3	2
Intra-City Carpooling	5	2	1	8	3
Total				**40**	**16**

Source: Own illustration.

the public authorities, the shortcomings in the institutional system (specifically the transport sector) and the general technological conditions in the markets. Furthermore, the informants were asked to describe the service concept (value proposition), the challenges of developing and operating a service in these constrained environments and how they responded to these challenges. Eventually, they were asked to describe the processes and activities they performed to turn their service ideas into reality. During the interviews, questions on concrete illustrations were posed to increase the data's trustworthiness.

The interviews were audio-recorded with the consent of the participants for transcription. The participants' identities, however, were kept confidential. Yet, there were also situations, when interviews and conversations were conducted quite spontaneously and unplanned, especially during the site visits. In these situations, extensive notes were taken, which conveyed trust and expressed a professional manner. The verbatim quotes were put in writing and typed up as soon as possible.[552] To increase the data reliability, a research colleague accompanied the author for 30% of these interviews. The similarities in the independent notes reinforced the confidence in the data quality.

Observations. In November 2015, the author travelled to three sub-Saharan African countries, including Nigeria, Kenya and South Africa, where she visited the startup offices as well as the

[552] Cf. Miles et al. (2014), p. 71.

business incubators and co-working spaces. The purpose of this trip was to gain impressions of the real-life settings in which the innovators operated and to follow up on initial telephone conversations. During the site visits, the author took detailed observational notes of the office spaces, the technological equipment and the overall interior design.[553] She also had the opportunity to observe situations of interactions of the staff, when the teams promoted their services "on the street" as well as when they presented their solutions on stage during conferences, sharing experiences, figures, facts and future goals.

In March 2016, the author was invited to attend a two-day innovation summit held in Switzerland about entrepreneurship in emerging markets by one of her informants. Approximately 80 startups, 12 venture capitalists and 20 corporate firms were present. The format included formal presentations, keynote speeches of well-known entrepreneurs and scientists, as well as panel discussions on topics such as investment strategies in emerging markets, innovation programs, best practices and latest trends in industries such as agri-, fin-, health-, ed- and clean-tech. During the presentations, the author took pictures, extensive notes, including verbatim quotes, and typed up these notes afterwards. She also recorded some presentations and panel discussions on video, when allowed.

During the conference, the author could interact with the participants, the guest speakers and the venture capitalists across a variety of industry sectors, especially in breakout sessions, workshops and over dinners, which helped to understand the specific conditions of emerging markets considering current technological breakthroughs. The author took the opportunity to ask questions and to check the inferences from initial interviews in the transportation sector. Participants were enthusiastic about their activities and spoke freely about their thoughts, strategic decisions and other opportunities. The conference was helpful because it also exposed the author to the challenges startups from different business sectors and emerging market regions, such as Latin America and South-East Asia, encountered and what strategies they applied to address them. These observations provided confidence in the emerging themes and patterns from the diverse iterations between the data collection and data analysis.

In 2017, the author also attended a digital conference in Berlin where one of the case leads organized a workshop by invitation only. The gathering focused on the specific challenges in

[553] See Appendix 12: Startup Working Environment

the transportation sector and new opportunities arising from the latest developments in blockchain, traffic management and AI.

Documents and Archival Data. Another key source of evidence were documents on the firms, including company brochures, firm websites, descriptions in the app stores and press articles. The firms also provided access to pitch decks, internal presentations, business plans and strategic roadmaps. This information supported the data triangulation of each startup's context, challenges, strategies and outcomes. Furthermore, the data regarding the economic and sector-specific context was mainly collected through reports published by specialized consulting firms, international organizations and institutions (e.g., IMF, OECD, McKinsey, African Development Bank (AfDB), GSMA), newspaper and media reports. Also, information provided on Crunchbase, a local startup website, was investigated and its social media profile followed. In addition, presentations, brochures and documentation from the attended innovation conferences were reviewed.

Digital Artefacts. A final source of evidence were the digital artefacts, in particular the smartphone apps. The apps can be viewed as the finished products of their activities and work. These artefacts were tested during the site visits to understand the user flow, the design of the digital touchpoints and the customer experience.

4.5 Data Analysis

This study, as already mentioned, combines two major techniques to analyze the data: multiple-case studies ("Eisenhardt method") and in-depth inductive case research ("Gioia method").[554] This approach allows shedding light on: (1) the constraints the firms experienced, (2) the executed activities and tactics to respond to these constraints, (3) the role of trust, (4) the dimensions of value creation and (5) the emergence of a distinct innovation capability.

The multiple-case design allowed comparing and recognizing relationships within and across the cases. It provided rich varied empirical evidence on whether emergent conceptual insights could be confirmed or not. The study retained only those concepts and relationships that

[554] This data analysis procedure has been inspired by the methodologies applied in the works of Smith (2014); Pansera & Sarkar (2016); Strike & Rerup (2016).

occurred across most, or all, of the cases, and, thus, resulted in a more parsimonious and robust midrange theory.[555]

The interpretive stance, which underlies the Gioia method, tries to capture how the respondents experience their realities. Hence, this study focused on knowledgeable agents, such as CEOs and CTOs, because they have an overview of what needs to be undertaken and can explain their thoughts, intentions, decisions and actions. In addition, this study gave voice to the informants in the early stages of the data collection and analysis to prominently represent them in the reporting of the findings. This tactic was useful as it allowed to truly reflect the informants' experiences and to translate them into theoretically relevant terms while at the same time meeting the scientific requirement of systematically presenting the evidence.[556]

Following the Gioia method, the study chose 'revelatory'[557] cases that offered rich data and potential to develop new, distinctive insights in the emergence of successful digital service innovation in resource-constrained environments. The goal was to understand the informants' systems of meaning, their understanding of local issues and the activities and mechanisms necessary to respond to them. This approach was especially motivated by the recent calls to make hidden processes visible by revealing and tracing how people experience and innovate with digital services, especially in resource-constrained environments.[558]

Phase 1: Within-case Analysis and Open Coding. The early analysis process began with a within-case analysis to generate first insights and to unearth unique patterns of each case. To do so, interview transcripts were analyzed by applying an open coding technique, also referred to as initial coding,[559] which describes the process of breaking down the qualitative data into discrete units of meaning by analyzing the transcripts[560] line by line.[561] Open coding was also complemented by analytical memo writing to reflect in which theoretical direction the study is going.[562] To reduce the volume of the codes, initial codes were subsequently assessed based on underlying similarities and differences, to infer a list of concepts, which was further grouped into more abstract categories. For example, similar concept codes, such as lack of data

555 Cf. Eisenhardt & Graebner (2007), pp. 25-30.
556 Cf. Gioia et al. (2013), p. 17.
557 Cf. Langley & Abdallah (2011), p. 214.
558 Cf. Lusch & Nambisan (2015), p. 156; Agarwal et al. (2017), p. 11.
559 Cf. Charmaz (2014), p. 114; Saldaña (2016), p. 115.
560 MAXQDA was used for the data processing and data analysis.
561 Cf. Strauss & Corbin (1998), p. 102.
562 Cf. Glaser (1978), p. 56.

scientists, brain drain or difficulties in the talent acquisition, were aggregated under the concept code "lack of IT talent".

This phase was helpful to "… become intimately familiar with each case as a stand-alone entity"[563] before patterns are generalized across cases. One critical insight that emerged at this stage was that respondents identified a number of constraints which they had experienced along their innovation journey. On the one hand, they described these constraints as complex, strenuous and frustrating, and, on the other, they viewed them as opportunities for developing a unique service experience. Furthermore, these innovators did not raise issues typically bound to the African context, such as colonialism or ethnic group identity. These insights guided the further analysis.

Phase 2: Axial Coding. In the next step, the goal was to consolidate the data that was fractured during the open coding process[564] and to identify relationships among the first-order codes. Axial coding was applied "… to link categories with subcategories and asks how they are related"[565], and to also specify the properties and dimensions of a category. The data was combined to explain the findings and to systematically develop categories and sub-categories. This also involved drawing diagrams to sort the logic between the relationships that were revealed over time.[566]

At this stage, informant terms or first-order codes were translated in more theoretical terms (second-order themes), answering the important question of "what is going on here?" in a form of gestalt analysis.[567] This analysis also led to more focused questions in the subsequent interviews. Axial coding is also viewed as the transitional cycle from open to selective coding.[568] To facilitate this process, again diagrams were drawn and tables were developed to depict relationships between the analytical concepts.

Disconfirmed patterns or relationships were then either refined or discarded. For this purpose, the data was also presented in tables. This approach also provided evidence regarding the underlying constructs and complemented the description of the findings. Gradually, tentative themes and concepts began to emerge, such as leveraging digital platforms, building trust and

563 Eisenhardt (1989), p. 540.
564 Cf. Strauss & Corbin (1998), p. 124.
565 Charmaz (2014), p. 148.
566 Cf. Strauss & Corbin (1998), p. 123.
567 Cf. Gioia et al. (2013), p. 20.
568 Cf. Saldaña (2016), p. 245.

the role of design, which helped explaining the phenomenon of successful digital service innovation in these environments. Special attention was paid to nascent concepts that did not seem to have adequate theoretical referents in the existing emerging market literature, such as trust and digital platforms. Afterwards, the author systematically compared the emergent frame with the evidence from each case to assess how the themes fit the case data.

If similarities were confirmed across cases, i.e., patterns or relationships identified, these themes were aggregated as theoretical categories. The goal was to generate more precise and complete explanations of the phenomenon, as Strauss & Corbin suggest.[569] This reduction of complexity through aggregation aimed at reaching a level where a maximum of explanatory power inheres in the categories.[570] During this aggregation process, relevant literature was incorporated.

Phase 3: Selective Coding. With this logic, the author returned to the data and applied selective coding techniques. For example, to analyze the activities and practices, action coding was applied. This technique describes the search for the routines and rituals of human life, especially changing and repetitive forms of action/interaction among persons towards achieving a goal. In other words, human action may be "… strategic, routine, random, novel, automatic or thoughtful"[571], as Corbin & Strauss state. To code the actions, the author scanned the raw data corpus and used descriptive or in-vivo codes for critical passages, which were clustered into meaningful categories. This process brought forth six critical themes describing the actions and activities innovators performed. These themes were shared with three other researchers, who were not involved in this study, and their feedback was used to clarify and distinguish themes. Noting similarities and differences,[572] the activities were clustered into two dimensions by applying labels from existing literature as "leveraging digital platform capabilities"[573] and "integrating [them] into [the] socio-cultural context"[574].

Furthermore, a broad set of constraints was identified that engendered certain activities, which resulted in certain outcomes. To do so, the author returned to the data and generated a comprehensive list of the constraints by using short descriptions or in-vivo codes. If similarities were confirmed across cases, these emergent themes were given second-order category labels.

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569 Cf. Corbin & Strauss (2015), p. 11.
570 Cf. Corbin & Strauss (1990), p. 8.
571 Corbin & Strauss (2015), p. 283.
572 Cf. Gibson & Brown (2009), pp. 128-129.
573 Cf. Helfat & Raubitschek (2018); Teece (2018).
574 Chliova & Ringov (2017), pp. 51-52.

For example, respondents in almost all cases mentioned: low-income constraints, limited technological know-how, lack of superior human capital and access to finance as key constraints, which were aggregated under the more abstract construct of "resource scarcity". Yet, it was decided to differentiate between two dimensions of resource constraints, namely firm-level and user-level resource constraints. Grouping the other constraints thematically and incorporating existing literature resulted in two more categories of constraints that emerged from literature, namely institutional dysfunctionalities and lack of trust, which were later aggregated to "institutional voids". Then, identified constraint categories were related to other components, such as actions, interactions and consequences, which were necessary for a theoretical explanation of the phenomenon.

Resulting from this phase, recurring theoretical categories or second-order themes of overall dimensions were grouped into a higher theoretical perspective, including: (1) experienced constraints, (2) service development practices, (3) multidimensional value creation and (4) the underlying pattern. These aggregate dimensions were helpful to increase the understanding of the emergence and the successful implementation of a digital service innovation in resource-constrained environments.

Phase 4: Building the Data Structure. Once the full set of first-order terms, second-order themes and aggregate dimensions were derived from the data, the data structure was developed to visualize the progress from raw data to terms and themes in conducting the analysis.[575] In this study, the data structure includes 38 first-order codes, which reflected the respondents' language and unveiled key elements of their meaning systems. The second-order themes were aggregated thematically from first-order codes to more abstract categories, explaining the phenomenon in theoretical terms, yet, without disclosing the relationships among the categories. In sum, the data structure helped to provide a graphic representation of the data analysis and is also important in qualitative research to demonstrate precision.[576]

Phase 5: From Data Structure to Theory. Finally, essential concepts, themes and dimensions in the data structure were integrated into a model that showed the dynamic relationships among the concepts to explain the phenomenon of interest. Former literature was embedded to inform about the relationships between the constructs. At this point, it was important to discover the underlying theoretical reasons for the existence of the identified relationships. This helped

[575] Cf. Gioia et al. (2013), p. 20.
[576] Cf. ibid, pp. 20-21.

establishing the internal validity of the findings.[577] Finally, this data combined with literature resulted in a model of designing for multidimensional value.[578]

4.6 Quality Criteria

Findings based on qualitative research are especially vulnerable to incomplete and 'subjective' judgments of the researcher. This study followed four commonly applied criteria to increase the trustworthiness of the findings, including: construct validity, internal validity, external validity and reliability.[579]

Construct Validity. Construct validity refers to the extent to which a research procedure leads to an accurate observation of reality by identifying the appropriate operational set of measures for studied concepts.[580] This study used three tactics to increase a construct validity. First, various complementary sources of data that converged on the same finding were collected. This also included different levels of informants to triangulate the perspectives.[581] Second, a chain of evidence was maintained through describing the derivation of evidence from the initial research question to ultimate conclusions by referring to relevant sources, including interviews, observations, archival records and artefacts. This allows tracing the steps of the evidentiary process.[582] Third, peer researchers and key informants reviewed preliminary results to ensure the quality and the adequacy of the interpretations.

Internal Validity. Internal validity relates to the validity of causal relationships by showing how and why an event led to the other. Hence, internal validity refers to the data analysis phase.[583] Pattern-matching is one technique to enhance it. It describes the process of constantly comparing empirically-based patterns with new data sets as well as with predicted patterns in literature.[584] Empirical patterns, thereby, describe the first analytical step, which involves the condensation of large amounts of coded data into more meaningful and parsimonious units of analysis.[585] Another technique, which was also used in this study is the explanation formation for the phenomenon under investigation by determining a set of causal links that, in general, fit

577 Cf. Eisenhardt (1989), p. 542.
578 Cf. Gioia et al. (2013), p. 22.
579 Cf. Steinke (2004), p. 184; Yin (2014), pp. 45-46.
580 Cf. Gibbert et al. (2008), p. 1466.
581 Cf. Jick (1979); Eisenhardt (1989), p. 542.
582 Cf. Yin (2014), p. 127.
583 Cf. Eisenhardt (1989), p. 549.
584 Cf. Yin (2014), p. 143.
585 Cf. Saldaña (2016), p. 236.

each individual case.[586] To arrive at the eventual explanation several iterations and feedback loops with outside researchers were undertaken to review the emergent constructs and increase the reliability and the validity of the interpretations.[587] The findings of this study were also documented to allow reconstructing the established causal relationships by following a story line of the model description that combines the categories in the theoretical model.[588]

External Validity. External validity refers to the generalizability of empirical findings. Generalizable results are essential for building a solid theory.[589] In case study research, the goal is to expand and to generalize theories (analytic generalizations) and not to extrapolate probabilities (statistical generalizations). To extend generalizability, this study chose, as above mentioned, a multiple-case research design instead of a single-case design to derive more powerful generalizations.[590] Furthermore, cases were chosen for theoretical and not for statistical reasons.[591] In addition, linking emergent themes and theory to literature helped strengthening the generalizability of the findings. Several concepts could be confirmed in literature, albeit in different domains. This strengthened the confidence that the study's findings were valid and generalizable because others reported similar findings in a different context. It further sharpened and enriched the conceptual level of the study. Yet, some findings stood in contrast to literature, forcing a "frame-breaking mode of thinking"[592], which also led to refining the limits for the generalizability of the focal research.

Reliability. The objective of reliability is to demonstrate that the procedures of a study, if repeated, will lead to the same results and conclusions.[593] Hence, documenting all operational steps is crucial to providing sufficient information for subsequent researchers to arrive at the same results. Two tactics were, thus, applied in this study. First, the underlying research design of this study was presented in the previous sections to increase the transparency and to allow an inter-subjective auditing. This involved a detailed description of the data collection process, the presentation of the interview guidelines and the relevant sources of evidence and a description of the case selection criteria and processes. Another way of organizing and documenting information involved using a case study data base to preserve all the collected

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586 Cf. Yin (2014), pp. 147-149.
587 Cf. Lincoln & Guba (1985), p. 296.
588 Cf. Corbin & Strauss (1990), p. 18.
589 Cf. Eisenhardt & Graebner (2007), p. 30.
590 Cf. Yin (2014), p. 64.
591 Cf. Glaser & Strauss (2009), pp. 49-52.
592 Eisenhardt (1989), p. 544.
593 Cf. Yin (2014), p. 49.

data in a retrievable form.[594] It contains all the case study notes, documents and other materials from the field. In the next chapter, the case study findings will be presented.

[594] Cf. Yin (2014), pp. 123-124.

5 FINDINGS

This dissertation's empirical objective was to investigate the creation of digital service innovation in three sub-Saharan African economies. The findings of the in-depth data analysis presented in this chapter comprise descriptive and explanatory elements, which provide responses to the study's underlying research question of how to develop and implement new services in emerging markets.

Subchapter 5.1 reports on the two cases, that had problems to establish and grow their service to contrast with the four cases, that have been able to successfully implement the service. In the narrative that follows, the sections describe the experienced constraints the innovators encountered (5.2), the activities they have performed to respond to these constraints (5.3) and how these affected the value proposition (5.4). This chapter concludes by describing the identified action pattern of NSD in resource-constrained environments (5.5).[595]

5.1 Two Approaches to Constraint-based Service Development

The emergence of digital services in emerging markets, especially how innovators develop and implement new services by using digital technology in resource-constrained environments, is a puzzle. This study found several answers to this question. More importantly, the study surfaced that digital technology alone was not enough to create a valuable experience for the user, rather the development and implementation of new services was built upon the interplay of different components.

Inspired by the breakthrough innovation of platform-based services originating from developed markets, such as Uber, Lyft and BlaBlaCar, all startups were driven by the idea to implement similar platform-based services to the local market. The concepts were enticing, because they were known for having created a discernible value proposition without any profound changes in the transport infrastructure. Furthermore, digital platforms were also viewed as the perfect match for resource-constrained environments because they were considered low cost, easy to access and easy to deploy tools to these firms that were unable to acquire expensive digital infrastructures and assets. Hence, all six startups in this study shared the common vision to develop and implement platform-based services to compensate for the inadequate supply of

[595] The selected format for presenting the findings according to identified theoretical themes and dimensions has been inspired by the works of Smith (2014) and Strike & Rerup (2016).

transportation and logistics services and to address uniquely local transport challenges to the African emerging market context.

But only four startups sustained this endeavor and implemented commercially viable services by leveraging digital platforms, while the other two cases struggled with the successful implementation and scaling of their services. This section briefly profiles these two cases that failed to grow the service and deliver the values they promised to their customers.

Intra-City Carpooling built a ride-sharing service platform to deliver a convenient and affordable way for urban trips, which could be accessed via the website. Beyond that, the overarching mission was to contribute to environmental sustainability by decongesting urban centers through carpooling, while also saving costs for all participants involved. The system worked based on the trip information, which passengers and ride owners entered in the online platforms and which then matched the ride owners with those seeking a ride. Similarly, Inter-City Carpooling created a ride-sharing platform that was built on the idea of connecting drivers with empty seats and passengers to share travel costs, but for long distance trips. Even though the need for efficient and affordable transportation was and is highly demanded, both firms struggled to attract people to their platform.

In both services, the innovators predominantly focused on achieving a cost-effective solution by leveraging inherent features and IT capabilities of digital platforms to keep the costs low. Correspondingly, they built only online websites as key access points for the service and focused on rising traction on site by pursuing a social media marketing strategy. For their drivers, they tried to reduce the costs by providing various discounts for other car-related services, such as fuel, carwash etc., and, thus, permanently sought to establish new partnerships with other local firms. They valued that digital platforms provided new ways of how businesses could connect and engage with customers and partners.

Both firms adopted digital platforms as augmentation mechanisms and facilitators for developing creative business models in these challenging environments. They particularly focused on leveraging the inherent IT capabilities of digital platforms for value creation. This reflected a technology-centered approach to service development and implementation, which largely neglected the social-human dimension of service development. Doing so helped them avoiding spending time and resources on user-centered research (e.g., ethnography) and user experience design. Rather, they used the Western-based service platforms as a blueprint for the service development process to realize and implement what had already been tested. Hence,

this approach to service development and design can be labeled as a service-engineering approach, which does not involve the end user and others in the creation of the new service and which widely neglects the local conditions.

Both startups deliberately ignored subtle but significant constraints in the local business environment that surround the core problem of an inadequate service supply, especially institutional constraints, such as a lack of information, a low enforcement of rules and an overall lack of safety and trust in transportation. They acknowledged these issues but avoided or ignored them in the service development process, and, thus, did not take effective measures to address these problems. One user of Intra-City Carpooling pointed to the hazards attached to the service:

> *The major problem with this service is security because anyone could ill-use the system to reach targeted unsuspecting users. To ensure the platform is safe, the provider said you need to sign in using your Facebook and LinkedIn accounts. Both processes are automated which means well designed fake accounts could easily go through.*

While the concept of carpooling is associated with substantial efficiency gains for all participants with up to 90 percent savings for the drivers, local safety and trust risks were seemingly too high, in particular "… in a city where emergency call does not work". The CTO of Intra-City Carpooling developed ideas to ensure security, such as partnering with security agencies to keep track of each ride. Providing the passengers and the driver of the cars with panic alarm buttons or putting up cameras within the cars were considered other safety measures. Yet, sharing a ride with a stranger for efficiency reasons was a highly uncommon practice in the African environments. Establishing this radically new social practice, hence, required substantial resources for communication and marketing purposes to gain the necessary legitimacy. Both services encountered severe resistance from the local user base against the new service, diminishing the success of the service, which was originally developed in and for the Western audience.

Similarly, Inter-City Carpooling engineered a service according to a Western blueprint, and expected rapid adoption rates, as the benefit for the users was made obvious. But after a short period, initial growth figures could not be maintained, and the market was eventually considered too small. The service was eventually shut down as customers did not adopt the service on the large scale. The CEO of Inter-City Carpooling made the following comment:

> *The plan was to run a free service for a year or two and focus on growing the user base. Over the last two years, the team put time and effort into growing the business and building a trusted ride-sharing community. We went from less than 1,000 members in the first few months to 12,000+ members; 106,630 rides offered and rides shared across 16 states. However, it does take a lot of resources to run this business and the initial plan was no longer sustainable. We came to the conclusion to shut down operations and close the business, as there were no funds to invest further.*

The major impediment was the missing large-scale acceptance and adoption of the service. As the CEO of Intra-City Carpooling noted: "It was really difficult to convince people to use the service. They were afraid because they did not know who they were driving with." The service concepts made sense to the Western user base, yet, were socio-culturally too distant for users in the sub-Saharan African context. The founders of Inter-City and Intra-City Carpooling primarily relied on the capabilities of the digital platforms and did not develop human-centered skills and capabilities to integrate the service with the socio-cultural environment. These two startups focused their attention mainly on leveraging digital platform capabilities. They were particularly enthusiastic about the transformational capabilities of digital technology and the new logic of creating business value as represented by companies, such as Uber and Lyft. As they were operating in Lagos, one of Africa's megacities, they expected large market potential. Likewise, the investors of these firms anticipated large revenues and early profits, putting the service team under pressure to perform in their figures.

Comparing these cases with the other four cases reveals critical differences around how the innovator teams approached service development and implementation, and more specifically, how they managed the various constraints in the emerging market context. For instance, both carpooling teams paid only little attention to the fact that in contrast to developed markets, they could not rely on institutional foundations such as laws, a reliable legal system and a regulatory oversight, as their Western counterparts can. These shortcomings in institutional foundations, however, carry severe risks for the end-users, and thus can lead to failure if not adequately addressed. Compared to the other two services, they devised a more complex set of actions and activities to address various constraints. These teams adopted a human-centered perspective to service development, by approaching problems with empathy and relentless efforts to explore the origins of the problems to co-develop adequate solutions. Hence, service development became a human-centered activity in which key problems were first explored before a solution could be found. Table 6 illustrates the comparison among these six startups. To reveal how

these four innovators approached service development and implementation, the narrative that follows includes a data structure display (Figure 13). It depicts the first-order concepts (left side of the figure) grounded in the tongue of the informants, the second-order concepts (middle of the figure) which consolidate the data to a conceptual level, and the four aggregate dimensions that emerged from the data analysis. The narrative of the first-order findings describes the emergent concepts and themes as they sequentially appear in Figure 13 which is supported by a data table of emergent constructs (Table 7). The relationships among the concepts are displayed in a grounded theory model of "designing for multidimensional value" (Figure 14), which graphically depicts the dynamic flow of the findings and illustrates how the experienced challenges, activities, practices and the multidimensional value proposition are intertwined.

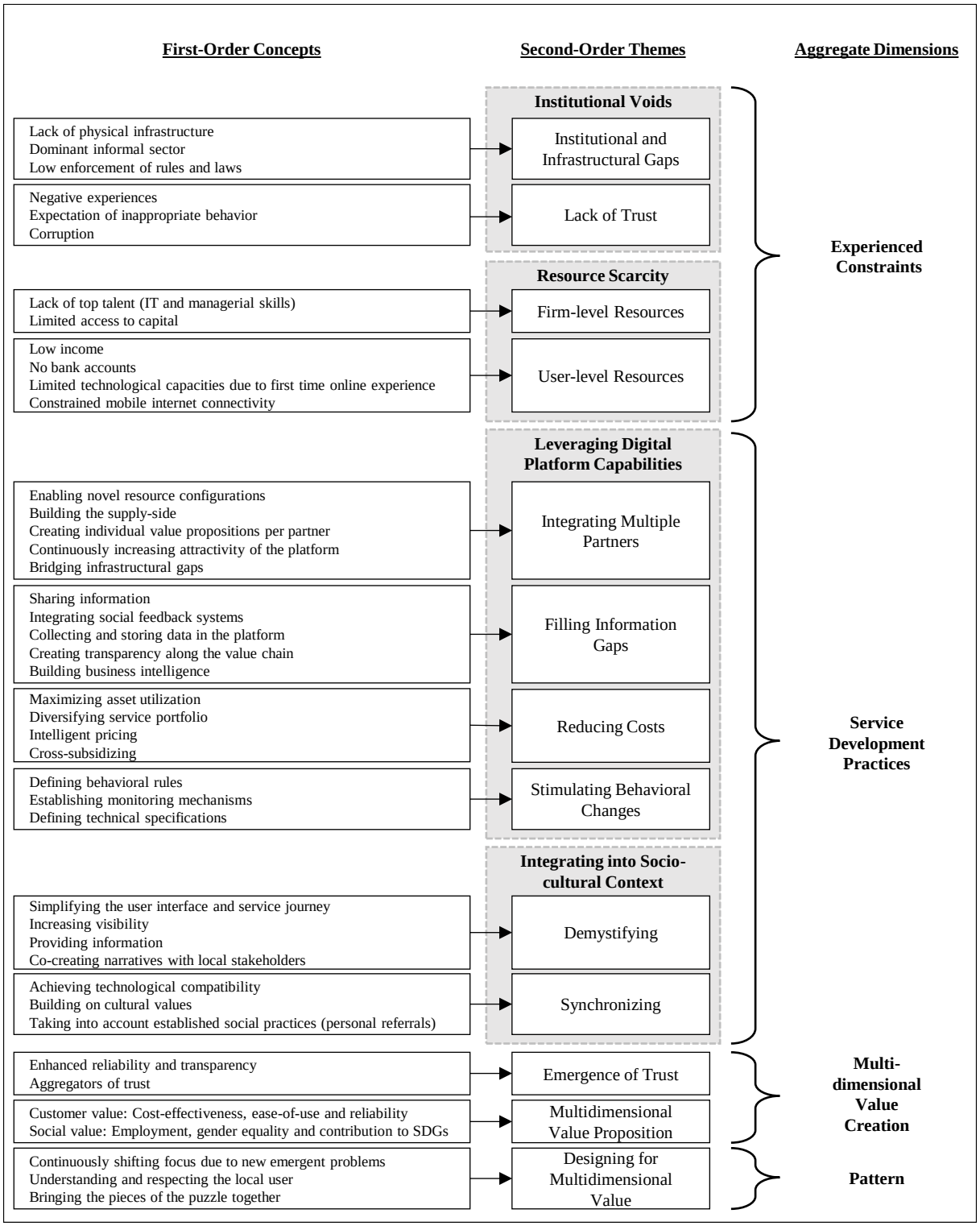
Table 6: Comparing Approaches of Developing and Implementing Service Innovation

		Trust Taxi	Motorcycle Taxi	Delivery Service	Bus Shuttle Service	Inter-City Carpooling	Intra-City Carpooling
Experienced Constraints	**Institutional Voids**						
	Institutional and infrastructural gaps	x	x	x	x	x	x
	Lack of trust	x	x	x	x	x	x
	Resource Scarcity						
	Firm-level resource constraints	x	x	x	x	x	x
	User-level resource constraints	x	x	x	x		
Service Development Practices	**Leveraging digital platform capabilities**						
	Integrating Multiple Partners	x	x	x	x	x	x
	Filling Information Gaps	x	x	x	x		
	Reducing Costs	x	x	x	x	x	x
	Stimulating Behavioral Changes	x	x	x	x		
	Integrating into socio-cultural environment						
	Demystifying	x	x	x	x		
	Synchronizing	x	x	x	x		
Multidimensional Value Creation							
	Emergence of trust	x	x	x	x	(x)	
	Multidimensional value proposition	x	x	x	x	(x)	(x)

(x) = relatively weak

Source: Own illustration.

Figure 13: Data Structure



Source: Own illustration.

Table 7: Data Supporting Interpretations of Second Order Themes

Dimension		Themes	Representative Quotes
Experienced Constraints	*Institutional Voids*	Institutional and Infrastructural Gaps	"Many places don't have foot paths, and you can understand even if I'm talking about mobility. We are dealing with an ecosystem or environment, where one should be able to walk to a place, can take a bike, can cycle to the next closest bus stop from where one can now take a bus or that one can go to the train station. In some neighborhoods there are absolutely no places to walk there is no lighting, so in the evening it is unsafe." (CEO, Motorcycle Taxi) "The public transport space in most African countries is non-existent, which means that people cannot go to their points of opportunity." (CEO, Shuttle Service) "You know in developed markets, where you can find a working transportation system, you don't have that in Sub-Saharan Africa. So, the gap between what's available and between a car is wide." (CTO, Trust Taxi) "The state can't get rid of the informal transport providers." (CTO, Shuttle Service) "If you take the matatu, there is usually no way of predicting the fare on a given day." (CEO, Trust Taxi) "We also looked at public safety and we heard a lot of complaints about quality of driving and about taxis in Nairobi." (Taxi Service) "The biggest killer after AIDS is traffic, isn't it insane? And it's because people don't know how to drive. They often don't have a driver's license." (CEO, Motorcycle Taxi) "There is only weak enforcement of laws and rules." (CEO, Motorcycle Taxi)
		Lack of Trust	"Being a cash ecosystem or a cash environment means that there are heavy rates of corruption, a police going to stop you and ask for bribe, because you are carrying cash. You cannot trust in public officials." (CEO, Bus Shuttle) "The government is probably your second most important key stakeholder, because at any moment they can come in and decide that they want to take a piece of your business and figure out, how they gonna do that." (CEO Trust Taxi) "So you can pay a lot of money and go through a lot of different steps to officially get these credentials, take a lot of time or you can pay about the equivalent of 5 Dollars and go down to one particular street and get all your credentials in a few minutes, maybe a matter of hours. So there is a big distrust in credentials and things like this." (CEO, Trust Taxi) "There was a huge trust deficit among logistics customers. They could never be sure, whether their orders will arrive" (CTO, Delivery Services) "This huge trust deficit has been cultivated over time through negative experiences, such as fraud, corruption and road accidents. … People generally expect to be exploited and are very skeptical to new players in the sector." (CTO, Trust Taxi) "We also experienced issues of untrustworthy staff and partners." (CEO, Trust Taxi) "So there is a big lack of trust in credentials and things like this and there is huge disparities in quality of service providers and not just in taxi, in almost everything." (CTO, Trust Taxi)

Table 7 (Continued)

Dimension		Themes	Representative Quotes
Experienced Constraints	*Resource Scarcity*	Firm-level Resources	"The biggest challenges by far are human resources. Human resources is incredibly difficult to find really top-performing people, that can build a company that can compete at a global scale, that have the IT know-how. This is a big challenge." (CEO, Trust Taxi) "The biggest challenge has actually been later getting an engineering team in place, because when you talk about big data, machine learning and artificial intelligence, there isn't great talent on the continent yet." (CTO, Shuttle Service) "And the biggest thing we figured out is human resource is such a challenge, like I had different strategies over time, but I still enhance them. For a long time, I was thinking, if we just invest in employees' skill sets for a long period of time, then they will grow into the role. But at a growing level you just can't take like five years to like grow somebody into a strategic personnel. It seems like the solution is just like pay ideally local talent. But this talent is scarce. … It's cheaper here to hire for low quality, but high quality human resource is extremely expensive." (CEO, Motorcycle Taxi) "Access to vehicles was extremely difficult. Vehicles are actually quite expensive relative to other countries. So, we've met a lot of headwind in that respect. ... And we also found out that our partners simply could not afford to buy the cars." (CEO, Trust Taxi) "Getting funding is another challenge due to low investor presence." (CEO, Motorcycle Taxi) "We asked ourselves. Can we actually build hardware [telematic unit] in Africa? And what we discovered is, that it is impossible, because you know, you have to ship in your product, it was just a crazy experience. Cause you wait for parts in China, they take a month to get here, some get lost, some get spoiled. You are again doing it. If I were based in China, based in Europe, it would probably be a different story. We would have that device already done, tested and even certified by now." (CTO, Bus Shuttle)
Experienced Constraints	*Resource Scarcity*	User-level Resources	"As we are operating in a low-income environment, we have to operate at a low-cost level to provide a competitive price." (CEO, Bus Shuttle) "People aren't concerned with safety, they deprioritize it to convenience and particularly cost." (CEO, Motorcycle Taxi) "Another key thing is technology. Technology and comprehension, like the way people use technology, is not as, like technology is new here. It means users, don't have for long a smartphone, smartphones are still a privilege in Africa. … Most people in Europe or North America, they are used to computers and Windows machine. So they already grew up with a keyboard and they have this legacy and familiarity with technology." (CEO, Motorcycle Taxi) "It's like they have an online experience that is the same that as what we had in 2001." (CTO, Trust Taxi) "In the beginning, education how to actually use the platform with our partners and even to a certain extent with our riders was a challenge." (CEO, Trust Taxi) "But here, quite often a smartphone is the first peak in technology a person's ever touched. And they don't have the experience. For example, like having an X to close the menu, people won't recognize. People sometimes don't realize the meaning and symbols of the different colors." (CEO, Motorcycle Taxi) "The biggest challenge for us with this was mapping. People are taught in school, like maps of the world, maps of the country, but people are very rarely taught about maps of their cities, specifically why is North at the top, how to read a legend, things like this. So, we are having like a huge number of people, primarily using the application, but they wouldn't know how to position themselves on the map." (CTO, Motorcycle Taxi) "If you talk to your partners (drivers), first you have to start explaining what telemetry is, how mobile networks work, etc." (CEO, Bus Shuttle)

Table 7 (Continued)

Dimension		Themes	Representative Quotes
Service Development Practices	*Leveraging Digital Platform Capabilities*	Integrating Multiple Partners	"And so for example we are negotiating a partnership right now with a multinational fuel company and to get discounted prices at the pump for all the taxi drivers using a prepaid fuel card, something like this. So, we have a partnership with an insurance company here to get heavily discounted rates on insurance for our drivers." (CEO, Trust Taxi) "We actually talk to cartels, that are organizing matatu and say, 'You guys are also being harassed by the police, you guys are suffering from low revenues.' And then we show them all the benefits they can have, if they join the platform." (CEO, Shuttle Service) "We teamed up with Alpha Drive [anonymized] which cut two years from our road map. ... We had to build the infrastructure surrounding the app's basic functionality so it would have taken us a really long time before we could have developed our own telematics. Building the level of detail that's in Alpha Drive's analytics platform would have taken more bandwidth and people than we had – and then we would have to continually maintain and improve it. It would be an ongoing distraction." (CTO, Motorcycle Taxi) "… we have a collaboration with a local bank, to provide ways for them to access financing to get either a smartphone or a motorcycle or both from other partners in our ecosystem." (CEO, Motorcycle Taxi) "We said at some point we have to open it [the platform] up to the public in partnership with banking partners, Scania finance, Toyota Finance to say: Hey you got someone who's gut 10k€ and we are telling them to invest in this business as a partner or as a franchisee and then we can take the augmented platform of finance from the other partners from the bank or other financing partners and we enable more people to participate."(CEO, Bus Shuttle) "So we found that our partners simply could not afford to buy the cars, so we had a partnership with a car manufacturer here, and a major bank. ... Of course, it is a win for them and its also a win for the bank, because you know they get more safer financing." (CEO, Trust Taxi)
Service Development Practices	*Leveraging Digital Platform Capabilities*	Filling Information Gaps	"Creating transparency for our customers is important." (CEO, Bus Shuttle) "Our customers are informed in real time about the status of their journey in terms of arrival time, name of the driver and the price they are expected to pay. We give them all the information they need." (CTO, Bus Shuttle) "We are generating an unprecedented amount of Big data, which provides information for different purposes and that can also help the government to develop a better urban transportation infrastructure." (CEO, Motorcycle Taxi) "Through the platform we could enhance transparency across the whole partner network. Every activity is precisely documented." (CTO, Bus Shuttle) "We now have reliable profiles of all riders. So everybody is officially registered." (CEO, Trust Taxi) "It is like creating transparency throughout the whole value chain. Bringing light into the dark." (CTO, Delivery Service)
		Reducing Costs	"We realized that people not only use motorcycle just to move themselves, but also to move their small packages as courier service. … So, we built an extension of the taxi service and also provided insured goods transport and courier at the smallest scale. Moving things is an important thing here, as logistics services are also in scarce supply. You can get everything in, a cake, flowers, parcels, ... and in the end you can provide a better price/performance for the customers." (CEO, Trust Taxi) "We had to diversify the service quickly, and search for B2B customers." (CEO, Motorcycle Taxi) "We are trying to see how to work together [with the OEMs], so that we can get at least some rebates, when it comes to bring in these green energy vehicles." (CEO, Bus Shuttle) "Businesses have been able to lower the cost of deliveries by up to 40 per cent and dramatically shorten the time it takes to deliver products to their customers." (CEO, Delivery Service) "The app not only helps SMEs save money on shipping, but has become a lucrative opportunity for drivers. We have some drivers on our platform that make a 100,000 Kenyan shillings/month, that's $1,000. When you work for a traditional courier company, you average around $150. And if you work as a boda boda driver, maybe you average between $250-300," (CTO, Delivery Service) "Up to 70% of the price you pay at the market for an agricultural commodity here is transport expense. So if you pay a dollar for your corn, 70 cents of that was transport. And so you look at the costs of food stocks. If you can bring the costs of transport down, that has ripple effects to the entire economy." (CEO, Trust Taxi)

Table 7 (Continued)

Dimension		Themes	Representative Quotes
Service Development Practices	*Leveraging Digital Platform Capabilities*	Stimulating Behavioral Changes	"Our drivers get monetary rewards: every positive review comes with a micro-incentive built into the ... app. SafeMotos' smartphone sensors measure each driver's control, caution, and focus, and this information contributes to monetary rewards. When drivers don't conform. We have a penalty system inspired by soccer – drivers that are 80-90% compliant receive yellow cards while those below acceptable levels get red cards and have to serve a one-day suspension in the 'penalty box'." (CEO, Motorcycle Taxi) "When we first launched, we had to do a lot of things to change behaviors of our drivers." (CEO Delivery Service) "We've done a lot of work there trying to skill guys into how to use the system and also what is expected in terms of service level." (CEO, Motorcycle Taxi) "If you just try to train them on how to drive, they laugh at you. You need to have a very strong value proposition for them and incentives, that help them to climb the economic ladder up, so that they feel proud to be part of the team and then perform an amenable ride." (CEO, Bus Shuttle) "We want to change how people treat the road by reminding them that every bad action is seen and as a result we create safety for our customers." (CTO, Motorcycle Taxi) "Our drivers deliver a better service experience because of the financial incentives for good performance and because customers now can review them." (CEO, Trust Taxi)
Service Development Practices	*Integrating into Socio-cultural Context*	Demystifying	"There needs to be a language that increases trust. Maps need to either be removed or buried in the app experience." (CEO, Bus Shuttle) A simple button (e.g., Pick Me Here), choosing landmarks, or choosing past verified locations would be a more effective way of ordering a driver." (CEO, Motorcycle Taxi) "So like social media is extremely cheap and just raising the profile of your brand and your making brand awareness. On top of this we get quite a bit of press and things." (CEO Motorcycle Taxi) "What we learned from our user experience testing is that all buttons should be visually large and obvious to be clicked." (CEO, Delivery Service) "Buttons should include its function in written or visual form. A minimum number of options should be displayed to reduce confusion. No icons should be used unless tested with a large number of target users for recognition (this is especially true of the current icons we use for customer service, GPS and scan). We have app visualization and flow mimic WhatsApp or Facebook as users have high knowledge of how these apps work." (CEO, Motorcycle Taxi) "The first registration should ask for the minimum amount of information, because people often do not have documents of their existence, such as IDs." (CEO, Trust Taxi)
		Synchronizing	"But what we have had the best success with, is something called incentivized referrals. ... You have a code in your app that you can share with your friends and family. ... This is actually how we are creating a viral way of sharing. and we've also built on top of this a street team." (CEO, Motorcycle Taxi) "Now, when we use applications like a food ordering platform that makes us go through ten screens and twenty form input items, we just shake our heads: has the developer ever talked to an end user? We think services will be far more rapidly adopted by understanding who the real user is rather than who the company wishes they were." (CTO, Motorcycle Taxi) "We're doing a big investment into technology, so that the service is very easy to onboard new users, obviously provides them value and will be a completely new service, I was talking about the dispatch service and USSD service, so that we're able to not limit our total available market just to smartphones." (CTO, Bus Shuttle) "And not only are we doing a mobile app, starting with Android first, we are also doing USSD. Why we are using USSD is simply because USSD can work on a dumb phone. Like you can dial the USSD code 789, tell us where you are and where you need to go and we will allocate you a seat on the bus and give you real time updates on the AT (arrival time) of the bus." (CTO, Bus Shuttle) "Downloading apps from the android app store, registration and having active data plans still lags far behind. Therefore, we incorporate a specific USSD service that runs on smartphones." (CEO, Trust Taxi)

Table 7 (Continued)

Dimension	Themes	Representative Quotes
Multi-dimensional Value Creation	Emergence of Trust	"From personal experience, we knew about the inherent risks of theft, so our first pivot was to focus on building Kenya's most trusted platform for all types of deliveries." (CEO, Delivery Service) "Everything is based on trust and referrals, and this is what makes the service successful." (CEO, Trust Taxi) "We are an aggregator of trust in low-trust-environments, because we are a way of basically having that connection with the service. So if the service is bad, you can have accountability. And if it's good you can leave a good review that will be seen by others." (CEO, Motorcycle Taxi) "For customers, we allow a segment of users who wouldn't take a motorcycle taxi because of danger to be able to use with more trust. … That's what we are doing currently with the use of ICT." (CTO, Motorcycle Taxi) "I would say, that we are a socially powered taxi and transport application, that can help you find the transportation you need through the people you already trust. So, we're built on your personal network, so that you don't just have access to a nearby ride but a nearby personally trusted ride." (CEO, Trust Taxi) "We are an aggregator of trust, so that you can know, you are getting a professional service, that can be delivered to you." (CMO, Motorcycle Taxi) "So our core value proposition is the convenience of movement, next with reliability and trust." (CEO, Bus Shuttle) "The major paint point these digital solutions can solve is the trust issue." (CEO, Trust Taxi) "And what we realized, was that trust was at the center of this not just for the clients, but for the drivers as well, because all of them have had this experience of being attempted carjacked by somebody posing as a client." (CTO, Trust Taxi) "We have built in a variety of trust mechanisms to make our service work." (CEO, Motorcycle Taxi) "So, we did not expect this to come along. But in the end, we have built a trust infrastructure for the service and our service ecosystem." (CTO, Delivery Service)

Table 7 (Continued)

Dimension	Themes	Representative Quotes
Multi-dimensional Value Creation	Multi-dimensional Value Proposition	"For customers, the rewards are more personal: safety and satisfaction – a combination that Motorcycle Taxi continues to advance. With our service, customers can notify drivers where they want to be picked up (by logging in to the app from their phone) using a localized user interface instead of flagging down a moto on the street." (CEO, Motorcycle Taxi) "Our customers benefit from a service that is trustworthy, easy to use and affordable." (CEO, Bus Shuttle) "As a customer, you now have access to an affordable, safe and reliable transport service." (CEO, Trust Taxi) "You have to define the bigger problem you are about to solve. Then, it becomes much more like a mission to increase safety and I promise you could save thousands of lives. You have to know what's the purpose, what's the idea. There are so many big problems to be solved here." (CEO, Trust Taxi) "So, the thing about innovation in Africa. It needs to be a kind of social Innovation and it is around the five pillars of humanity. If you think about healthcare, education, access to finance, governance and agriculture. These are the top 5 areas that you find a lot of startups working on – I would say 90% of startups. So, there is a lot of startups doing solutions in governance, because governance is a big headache in Africa, you know transparency in governments. Agriculture, around 70% of young people are employed in agriculture. So there is a lots of solutions in agri as well, providing farmers with weather updates, best practices all those kinds of scenarios." (CTO, Trust Taxi) "We were taking the app-based transport service idea, made famous by Uber, a step further by ensuring its product is based on the local needs of both passengers and drivers. Demonstrating this, we joined Business Call to Action (BCtA) with a pledge to ensure one in five of our drivers are female; to reduce road accidents by providing driver training and conducting safety checks on our drivers; and to increase incomes by ensuring that its drivers are paid 15% more than average motortaxi drivers by 2020." (CEO, Motorcycle Taxi) "The opportunities are huge as well, because the market is so much less saturated in almost every area than it is in the West. And the problems are bigger. So, if you can figure out how to help, help some people in poor rural areas, for example, to get efficient access to electricity. Then you have 800 million people that you can bring that, too." (CEO, Trust Taxi) "I talked to the women who sold goods on the side of the street, which is not allowed in Rwanda. When I interviewed them, I told them we could change their lives. I told them, they no longer had to fear the police who would chase them because they were selling goods on the side of the streets. But when I tried to talk these women they said, 'No woman can do that'. They thought people were going to laugh at them, and they thought they wouldn't be able to ride the motorcycle. They were simply afraid of doing it." (CMO, Motorcycle Taxi) "We also create social impact, we believe, the element of employment is foundational for the success of the service. At scale, we project that we will be curating a few 1,000 buses shuttles and vans. And each shuttle and each unit has a cabin crew. A driver and a conductor. Someone who would mind the riders. So you could imagine with a few thousand buses on the road, each of them having a squad of 2, that means that 4,000 people of employment just within the 5-chair space, just in terms of the driver and the assistant. Not to mention, running such a fleet, there is also a lot of employment opportunities, in the maintenance of it." (CEO, Bus Shuttle) "We've learned that you can build a Silicon Valley style application that has a solid social impact anywhere in the world. … and that we can help change the world beyond one application." (CEO, Motorcycle Taxi)

Table 7 (Continued)

Dimension	Themes	Representative Quotes
Pattern	Designing for Multi-dimensional Value	"We want our app to feel special to users, something they take pride in and want to show off." (CEO, Bus Shuttle) "We are proud to announce the new version of our smartphone application: what we believe to be the most localized piece of software ever built by an African startup. It's been a rocky journey though, with many missteps along the way. And we are excited to see where we will be going in the future with the service." (CEO, Trust Taxi) "Our product started off very simple when we launched in Kigali, Rwanda in June 2015: let's take Uber, pair it with motorcycles, shove in some sensor telematic tracking and boom, have a product where we would take a percentage cut from every trip. We pretty much immediately fell flat on our face and so began our journey of understanding consumer behavior in this region." (CTO, Motorcycle Taxi) "We observed behavior we couldn't have predicted and so had to redesign certain features again and again." (CTO, Bus Shuttle) "It is important to have a good plan, but here you have to be willing to throw it of the window at any time." (CTO, Trust Taxi) "The people we design the services for often have low literacy and mobile tech skills. And you sometimes see how a user struggles to complete (what is to you) a basic instruction on your service screen. This insight, however, is a resource for improvement and designing a more intuitive solution to it." (CEO, Motorcycle Taxi)

Source: Own illustration.

5.2 Experienced Constraints

Engaging in NSD in the local transportation sector in sub-Saharan Africa brought to the surface a complex web of constraints, which can be grouped into two major categories: (1) institutional voids, that represent the various malfunctions of the institutional system and (2) resource scarcity, that comprises the scarcity of firm- and user-level resources.

5.2.1 Institutional Voids

Institutional and Infrastructural Gaps. First, all informants encountered a bundle of institutional and infrastructural weaknesses as they started to develop and implement the new service. One major obstacle that entrepreneurs experienced was the underdeveloped physical infrastructure. Road networks, highways and metro railway lines were in short supply and seen as 'insufficient' for the increased movement of goods and people. The CEO of Motorcycle Taxi illustrated the situation in Kinshasa as follows:

> *It's one of the biggest cities in Africa. It has a good technology infrastructure and it's been the most challenging city world I had been moving around. It has maybe 15 governed buses and it has a city of 15 million people. And the way most people get around is painful, slow and particularly not priced intelligently.*

The respondents depicted the public and physical infrastructure as "non-existent", "deficient" and as "inadequate in meeting the rising demand for public transportation and logistics services".[596] For example, Bus Shuttle grappled with very poor conditions of the road network as a limiting factor for the geographical expansion of their service:

> *Of course, we need better roads because if I'm going to run a city bus that is a low riding city bus, then we cannot have potholes on the road. We cannot have speedbumps. That one speedbump is a size of a mountain and the other speed bump is not existent, it is tough.*

At the same time, the transport industry was described as a fragmented sector, because regulations as well as the structure of the industry were not rigorously determined by the local government. Respondents pointed out that competing, operating and surviving in the transport

[596] See Appendix 14.

industry is challenging, because of the dominant role of the informal sector in the market. The CEO of Bus Shuttle described the negative side-effects resulting from the informal sector:

> *In Kenya, the so-called matatu industry is worth $2 billion and has no state-ownership, plus they pay no taxes. Because of their size, it has been difficult to regulate and systematize the public transport sector.*

The CEO of Trust Taxi explained the major advantages of informal services compared to formal transportation services:

> *You go down the street and there comes a matatu. I can jump in and drive for hours. The formal bus companies were not able to deliver a better product in terms of buying a ticket. I need to go down to a place, stand in line and wait like 15-30 minutes. It is because they don't have technology.*

The respondents explained that "ill-planned policies" and an "insufficient supply" of public transport created a fruitful ground for informal service providers to become the dominant players in the market. Even though they seem to complement the deficient transportation system, informal service providers are also viewed as being the source of many problems. The CEO of Bus Shuttle explained that one major issue with these informal services is "the lack of transparency and reliability". Customers, for example, cannot rely on standardized prices, arrival times or expect an amenable service experience because informal drivers often behave dishonestly and haphazardly, disregarding any formal rules.

Furthermore, the respondents observed that passengers also faced other hazards in their daily travels, such as "violence", "abuse" and "harassment" from informal transport vehicle operators. The CTO of Bus Shuttle gave an example:

> *You know, I can't go on a matatu with my laptop, it might get stolen. Sometimes, I feel that I could not put out my phone and must keep it in the pocket until I am done with my trip. And for women it is even worse.*

Informal operators as key competitors also had to be treated carefully because they were likely to display violent behavior. The extent to which regulations can be invoked and enforced in case of unethical behavior is very limited in a context devoid of a reliable legal system. The CEO of Bus Shuttle stressed:

> *The other challenge was that like when we are doing our market activation, and some of the routes are actually controlled by cartels, and you run the risk of getting*

> *your inventory burnt and things like that, you have to have a very tactful ground game in terms of how you are interacting with other players.*

The lack of regulation in transportation and the weaknesses of the institutional system are also reflected in the number of traffic deaths. Motorcycles and informal minibus services have been viewed as the main causes for the large number of road accidents due to "careless driving", "unsafe habits" and disregarding traffic rules. Drivers often do not adhere to rules and speed limits and do not have the knowledge of how to ride a vehicle in a safe way, as the CTO of Trust Taxi explained. Similarly, the CEO of Motorcycle Taxi stated that, "If you hop off the motorcycle at your destination, you feel like: Oh, my God, that guy almost killed me. And here, moto accidents are the second leading cause of death – after HIV/AIDS." Also, vehicles and buses were described to be in a bad condition, with "broken speedometers", "defect headlights", "a lack of safety belts" or "dirty and smelly seats" because they do not need to pass technical inspections or need to fear being stopped by the police for these safety deficiencies. This absence of effective sanctions, such as penalties and a reliable legal system, were viewed as the main reasons for the various dysfunctionalities and the opportunistic behavior in the transportation sector.

Lack of Trust. Respondents described the widespread lack of trust as another major void in the local business infrastructure. This absence of trust manifested itself in different ways. First, informants described customers as sharing an unspoken, but ingrained distrust towards the conductors of minibuses or taxi drivers because they usually feel being at risk to experience some form of unethical behavior during the ride, such as "robbery", "fraud" or "careless driving". Furthermore, customers could not predict the prices and were used to regularly switch their mode of transport. As the CTO of Bus Shuttle underlined: "The minibus fares are not standardized and many customers have to decide every single day whether they can afford to take the mini-bus or must walk."

These negative and unpredictable incidents were reported as being regular occurrences in the transportation sector, which cultivated a deeply entrenched distrust among the customers. Respondents ascribed this deep sense of distrust to the negative experiences customers made over the years with existing transportation services – predominantly performed by informal service operators. "Most people in Western cities wouldn't accept all those risks traveling to work or across town, but people here have no other choice and motos and minibuses are the fastest and cheapest mode of transportation", as the CEO of Motorcycle Taxi stressed. Since people only have limited choices, they "seem to have learned to accept these risks to somehow

go on with their lives because private motorization, such as buying a car or motorcycle, are often beyond their financial reach", as the CEO of Bus Shuttle explained.

All respondents recognized the vital role of personal networks and referrals from people they trust to mitigate the risks of transactions with new actors. The CEO of Trust Taxi exemplified how customers try to circumvent this trust void in the local taxi sector by leveraging their personal networks:

> *People don't go with a random taxi driver; it is not a function here. A taxi is a person who has relationships that you know, you trust, you always call your taxi guy, he is always available for you, except when he isn't, and then we he is not, he sends you his trusted colleague who you'll only accept to work with because he is personally referred, where you can even reach your driver on the phone. Or you'll call your friend and your friend will send her trusted taxi guy to pick you up.*

The innovators observed that customers preferably interacted with members or actors within their "personal networks" or whom they have been referred to and tried to perform transactions exclusively within the confines of their "personal trust radius", as the respondents observed. This trust deficit in the transport sector also posed a large obstacle for the implementation of the new services because the innovators were affected by the general reluctance and skepticism that customers displayed towards transportation service providers. Hence, in addition to gaining social approval and legitimacy as young firms, the innovators acknowledged needing to find ways to overcome the suspicions and prejudices of local customers and rebuilding trust if they wanted to create a commercially viable solution.

Furthermore, all innovators encountered trust issues when interacting with potential business partners, especially local drivers. One key problem was that drivers were often not officially registered and could not provide documents, such as IDs, certificates or licenses, which confirm their official legitimacy and experience in driving. And if they did, these were often counterfeited versions. The CTO of Trust Taxi noted: "Because identities can be easily faked, it is difficult to trust someone … Here the likelihood is high that the person will take advantage of you." The CEO of Bus Shuttle also explained that contracts were useless in the local environment because if one violated the agreement, the legal system was too weak to enforce the agreed upon contractual terms. Consequently, dishonest actors did not have to fear the prospect of legal sanctions. This means that innovators could not rely on business-supporting institutional foundations as a backbone for their service if things did not turn out as originally agreed on with business partners or if fraud occurred. The lack of official information,

combined with a rudimentary developed legislation, substantially complicated the process of collaboration and network formation.

Respondents also struggled to trust in public officials because of high levels of corruption. The CEO of Shuttle Service exemplified the problem of corrupt public officials on the ground: “As soon as your vehicles are on the ground, the police gonna stop you and ask for bribe because you are working in a cash ecosystem.” Similarly, the CEO of Trust Taxi stated: “At any moment, they can come in and decide that they want to take a piece of your business.” Governmental intentions and actions were, thus, often perceived as detrimental to the new service and the underlying business. The respondents described this ambient trust void as “slowing things down” and “complicating the situation”.

5.2.2 Resource Scarcity

Beyond describing institutional voids as experienced constraints, the innovators also depicted resource scarcity as substantially affecting service development and implementation.

Firm-level Resources. First, startups grappled with the severe lack of high-quality human resources. Especially, the lack of senior IT personnel with competences in “data science” and “software engineering” posed a substantial obstacle for the young tech firms and the fate of the new service. The CTO of Bus Shuttle elucidated this issue:

> *The biggest challenge has actually been getting an engineering team in place because when you talk about big data, machine learning and artificial intelligence around this service, there isn’t great talent on the continent, yet. Those people who have been exposed to it and who can do it, are a bit expensive.*

Employing local tech talents was associated with high financial costs for the startups because the available pool of senior developers and designers was small compared to the demand, and, thus, over-priced. The vast pool of cheap workers, on the other hand, required a lot of training to compensate for the educational gaps. Due to the lack of effective government investments in education and building the skills of their human capital, the burden was on the shoulders of the firms to train and skill the employees and partners in-house. The CEO of Bus Shuttle noted: “The problem with human resources means that you can’t kind of rely on doing their jobs properly.” The CEO of Motorcycle Taxi was frustrated about Western misconceptions of human capital costs in emerging markets:

> *Investors generally expect 'cause you are in Africa, so things should be cheaper. So, you don't get financed the same way you would in North America or Europe. But in fact, while some things are cheaper, like getting one chair is cheaper, but top talent is top talent, and if you are trying to get someone who can enable the company, it's not cheaper to find him here, it's going to be more expensive, 'cause you have to create a financial incentive that makes him slip into an extremely challenging environment, like in Kinshasa, for example. It's cheaper here to hire low quality, but high-quality human resource is extremely expensive.*

Likewise, human resources with superior managerial competences were also in short supply. As the CEO of Trust Taxi stated: "[Finding] human resources is incredibly difficult, to find really top-performing people that can build a company that can compete at a global scale. This is a big challenge." Managerial capabilities were viewed as particularly important for the growth stage when firms began to scale the service, enter new markets and seek to establish operational routines. The CEO of Motorcycle Taxi voiced his frustration:

> *Human resources are such a challenge, and it is just frustrating when you want to hire because hiring is hard to do here. I am trying to hire six to seven people right now and it's my full-time job.*

Overall, human resources associated with advanced education were a bottleneck for all innovators. Respondents further described that most talents seek to start working for startups and companies in developed economies, because of better remunerations, improved work conditions and overall better opportunities. The CEO of Motorcycle Taxi described these aspirations:

> *People dream about living in North America and Europe. So, most people who are kind of successful and often educated enough to be able work at a higher level, would prefer to work in North America or Europe, where their kids can be in elite schools, make it a prestige factor and it's a more comfortable lifestyle. Though, there is also kind of reverse brain drain in terms of people being motivated by stories that allow them to empower their countries where they are from.*

It is expected that it will remain difficult for startups to find and afford talents with technological and managerial competences. With the brain drain of top talents, the respondent projected that the availability of superior human resources in the local business environments will continue to decrease. In view of this decreasing human capital availability, the respondents expressed their worries about the viability of their businesses and the scalability of their services.

Access to financial resources was reported as another major constraint for all startups. The founders complained about the limited access to capital to scale their service, high interest rates (often above 20%) and exploitative venture capital (VC) investment proposals. The CEO of Bus Shuttle illustrated the difficulty of raising capital: "Capital is a big challenge because I can mention sometimes capital to kick-start something is not something that you can raise in the local market easily. So, you have to constantly look at how you manage that." Especially, early-stage funding was experienced as a major obstacle in the African context, as the CEO of Motorcycle Taxi highlighted:

> *There is no shortage of VC for later stage deals, more investments are opening all the time, anything that is at the Series B or beyond, I would say probably that is not so hard to find funding. There is a big gap in an early seed stage, angel stage funding.*

Access to capital was important to finance service-relevant assets (vehicles, motorcycles, smartphones, equipment and branding) and pay the team. For Bus Shuttle, Motorcycle Taxi and Trust Taxi that were aiming at changing the fleet of vehicles on the road, the lack of financing options was a key hindrance for implementing the new value proposition as bank institutions were generally unwilling to either give credits to the young tech firms or to their partner drivers, who could not provide financial statements and a driving history.

Even though there were various sources of donor money from NGOs, all innovators tended not to use this money as it might distort the business and distract the company from its original purpose, as the CEO of Trust Taxi elucidated:

> *If you do have a social impact concept, there is a wash of impact investors, international donors, NGOs, that are looking to invest in social impact-focused businesses, even if the social impact is like Kenya at its best. A lot of times, one of the challenges is in this market that this money comes with a lot of strings attached. And so often they will distract the company or an entrepreneur from their primary purpose because they say we gonna give you this money, but you must do this slightly different. And one is faced with the choice between go out of business or take the money and be willing to pivot slightly, most people choose to pivot but then, it's necessarily not their first choice. There are a lot of challenges around that money. There's a big argument, very constant discussion, back and forth, whether all this donor money is good or bad for the startups in the innovation ecosystem here.*

Furthermore, the CEO of Bus Shuttle exemplified the investment mentality of local business angels:

> *The angels that are here they often didn't make their money in technology they made it in some traditional sector and so when they invest, they don't necessarily invest in a way a tech investor in another tech ecosystem around the world might. So, they tend to be less angel like, it's not uncommon to find a Kenyan business angel who will say something to you like: "Sure, I'll give you 50,000 dollars, but I want 40% of your company." And with these deals, you can only walk away from that offer.*

User-level Resources. Operating in a low-income environment was experienced as another key challenge because the startups needed to ensure the service to be affordable for the customers and to still generate a profit to sustain the business.

The young tech firms faced a situation where large parts of society could not afford transportation and where the middle-income groups were perceived to be extremely price-sensitive. As the CEO of Motorcycle Taxi said: "More than half of the population is unable to afford motorized transport." The CEO of Bus Shuttle illustrated the transport situation in Nairobi's slum area:

> *Kibera is one of Africa's largest slums. But what's happening for the bottom of the pyramid is that maybe a simple bus ticket seems too expensive. In a sense that they are forced to either walk or cycle to work. And most of them go to work in the industrial area of Nairobi. They start working as early as 4 AM. They are on the road walking. They are in a miserable situation because there is a wide gap in terms of what is publicly available and what can be afforded.*

Hence, startups faced difficulties with targeting the huge customer segment situated at the bottom of the pyramid in the early phase. The CEO of Motorcycle Taxi clarified their strategic course of action:

> *It's not our purpose to make a product that is just for the middle class. It's just challenging because you need to make the right product for this market. In Kigali, it's been challenging to market for the value where we can price ourselves at.*

The respondents were aware of the volume and the potential at the BoP and the impact they could possibly create if they extended the value of the service down to the lowest income segments of society, yet, was considered for the later stage.

Furthermore, available payment options posed another key obstacle to the functioning of the service and the underlying business model logic. Respondents described that viable customers often did not have bank accounts or credit cards, so that the rate of successful cashless transaction was low. The CTO of Trust Taxi noted:

> *It's not so much that people don't have the cards to pay, but also even if you have the cards, the likelihood if the card works is extremely low. It's like half of what you see in the West.*

Similarly, the CTO of Bus Shuttle said: "Payment doesn't work. We had 100 credit card transactions and only one got through. In the other service, from 40% of the trips, we didn't get any cash. We had so many issues with credit cards that we had to shift to cash."

Innovators described the lack of digital skills and literacy of the end users as additional key barriers to the service development and the implementation. While entrepreneurs were enthusiastic about the rapid penetration of the mobile Internet as the key enabler for addressing many problems, they realized that building a digital service innovation for the emerging market context was more complicated than expected because of the users' limited digital capacities. As the CEO of Motorcycle Taxi stated:

> *User-testing revealed that customers didn't recognize many kinds of things in the service-frontend that is taken for granted in the developed economies. And this really took me by surprise. For example, like having an X to close, people haven't recognized. People sometimes didn't realize the meaning and symbols of the different colors, saying for example "You should click here".*

The CTO of Motorcycle Taxi explained that the lack of intuitive usage can be attributed to the fact that local societies are online for the first time and had not been exposed to IT and the Internet before to have the chance to learn how to intuitively use their smartphones and apps respectively:

> *Most people in Europe or North America, they are used to computers and Windows machines. So, they already grew up with a keyboard and they have this legacy and familiarity with technology. But here, quite often, a smartphone is the first peak in technology a person has ever touched.*

These insights in the customer behavior with mobile phones, especially the limited comprehension of how to effectively use a smartphone, had wide-reaching implications for both

the service development and the implementation. They realized that the Western service blueprints required a substantial redesign if they wanted to be successful in the local market. The CEO of Trust Taxi noted: “It slowed down everything, because we had to design everything from scratch, so that the service makes sense for the people in their current development stage.” This crucial insight had important implications because they had to pursue a different design approach and abandon the initial concepts.

Furthermore, the use of the mobile Internet was reported as another major problem. The CEO of Bus Shuttle elucidated that people often bought smartphones but did not have a mobile Internet. For many people, mobile Internet is still too expensive. This represented another bottleneck for the implementation of the mobile service app. The CTO of Motorcycle Taxi explained that data prices in some markets remained relatively high and that people could not afford these extra expenses:

> *So right now, it’s like the biggest revolution in the world right now, it’s like a 20 dollars smartphone. In Rwanda, like your house staff will have a smartphone and the smartphone itself is a bottleneck. The bottleneck is data because people want to use smartphones, but they won’t always have active data plans. They also don’t have the comprehension how to use a smartphone. So, for example, what is extremely common for people is that they have smartphones, but don’t have an e-mail address. They don’t have the Google Play Store or Apple App Store installed. People use it primarily for Facebook, making transactions and sending messages.*

The respondents emphasized that these multiple constraints surfaced over time and could not be identified at the beginning of the service innovation process. As a result, all innovators were confronted with a complex web of constraints, that were associated with the problem of transportation poverty. This means that the innovators, who were motivated to develop new transportation services, could not only focus on the development and implementation of a new service, they also had to find ways to fill the gaps in the institutional system.

5.3 Service Development Practices

5.3.1 Leveraging Digital Platform Capabilities

Analyzing how innovators responded to this complex web of issues surfaced various actions. One category of practices involved several activities of creatively using the features and the inherent IT capabilities of digital platform technology to respond to these severe issues. These

activities were collectively referred to as leveraging digital platform capabilities to address the various shortcomings in the local context.

Integrating Multiple Partners. First, to better cope with the scarcity of the resources, the founders engaged in networking with external partners. To access relevant resources from potential partners and enable new resource combinations, digital platforms were used as facilitators for partner integration. The innovators primarily had to focus on building the supply-side of the service platforms by providing an adequate number of vehicles on the roads, equipped with sensor technology often used from the smartphones. To do so, all four firms approached existing fleet operators and taxi drivers, predominantly from the informal sector, to recruit drivers with vehicles. These conventional operators usually lacked a marketing strategy and a digital service offering. The CEO of Delivery Service explained the logic behind the partnering strategy: "We work with partners, which means we don't own any assets. We don't pay salaries to any drivers. We connect drivers with vehicles to people who want to do deliveries." To convince this group of private fleet operators to join the network and to neglect their previous business model, the innovators had to come up with strong value propositions. The CEO of Bus Shuttle, for example, highlighted the efficiency gains that are realized through aggregating functions on the platform when talking to different partners:

> *When we talk to fleet operators, we are saying you can drop your old models of work and actually join this network that gives you transparency, revenue guarantee and value that is measurable because we aggregate demand, we do the ticketing and dispatch your vehicles equally.*

To increase the attractiveness of the platform and to offer stronger and instant incentives for the drivers to come on board, the startups worked towards interfacing with firms, which were not constituent for the service itself, but that could provide these extra benefits for the drivers. The CEO of Trust Taxi explained that providing these additional benefits for their partners was important because it increased their willingness to collaborate in the long run. To increase the incentives, innovators approached a diverse set of partners, such as telco providers, insurance companies, banks, oil companies and car wash stations, with whom they could co-create benefits for the drivers. The CEO of Trust Taxi stressed:

> *Most of our initiative was around leveraging the benefits that we could give to the drivers. We partner with many organizations, such as car servicing, car wash and insurance. Each of our customers will get some sort of discount as well … So, it's really big on the incentive part.*

To create a win-win situation with this group of business partners equally required a strong value proposition, which clarified what they could expect from this partnership. The CEO of Bus Shuttle, for example, aimed at giving "… everyone on the bus free WiFi to a certain point, so that customers could look up content during the ride." To negotiate a cost-efficient solution, they made the following proposition to the telco provider:

> *If we get anonymized cell phone data from this mobile operator, we are able to sell some of the operators' products within our environment … Remember people are also browsing on the bus and in cars. By partnering with them in terms of a commercial product, I could increase their sales in mobile data by 5-10%. So, there's always a bottom-line agenda there.*

The digital platform created the required transparency for this type of collaboration among actors because it collected data about the exact amount of value that was exchanged and at what time and in what frequency.

The digital platform was also used to bridge the persistent infrastructural gaps in finance and to build partnerships with financial institutions, such as banks. All the respondents faced the issue that most of the individual drivers did not own their cars and did not have the financial resources to buy a car or to obtain a financing plan. The CEO of Trust Taxi explained how the digital platform enabled the emergence of a new cooperation that would be unthinkable without the technology platform:

> *Our technology platform provides consistent data and information. In the banks, they ask you for collateral and maybe how many statements you have and all these things. The segment of people who are looking for a job opportunity, especially in our markets, either don't have these structures of credit scores that help them to get finance and in case they get financed, the interest rates are often above 20%; that kills the case. So, what we do is behind the scenes we go to the bank, we go to the OEMs, we basically present the case, where we are saying: Here is our sort of data that allows you to see the creditworthiness of the driver. We have the data that is showing you this partner can afford to pay off the car, so that's where we are coming from.*

Drivers who never had an official record of their existence (e.g., birth certificate) or access to credit were now able to open a bank account and create a transaction history. All four firms reported, that bridging this infrastructural gap by creating access to finance for the previously informal driver who could work towards owning a car for the first time in their lives or get a

banking account for their savings, has worked as an extremely strong incentive. These prospects let them "experience pride" and "greater identification in their role" and overall made them more aligned with the startup's goals. The CEO of Trust Taxi describes this effect:

> *So, basically 'cause we mainly worked with independent taxis, so these are a guy that either rents his vehicle by the day for about ten dollars and then it works as a taxi or maybe if he is lucky he owns his vehicle. But very few of them own and all of them dream of owning a car and a taxi. It is by far their best chance they have of climbing any economic ladders to own their own vehicle.*

To build these new value relations and to create a "win-win situation" for all parties involved, the startups had to continuously create differentiated value propositions that satisfied the expectations of their multiple partners. Once these new value structures had been established, the startups managed and coordinated them by leveraging the capabilities of the digital platforms, i.e., the performances and contributed value of each party was documented.

Filling Information Gaps. To overcome the severe information deficit in the transport sector, the platform was used to provide automated information, such as proposed routes, expected prices, arrival times and durations of the rides, for the customers to enhance the transparency and the reliability of the service. "It is like lighting up a candle in the darkness", one manager of Motorcycle Taxi noted. The real-time flow of the information and the instant confirmation, on the other hand, boosted the customer confidence in the service. For instance, the CEO of Bus Shuttle explained the value of real-time updates:

> *A key pain point that people are experiencing here is, I am standing at a bus stop and I have absolutely no idea when my bus is going to get here. With technology, we're able to give people that time back and say: Lisa, you can sit at the office and we are able to tell you, when your bus is seven minutes from your pick-up spot and then you can walk slowly and by the time you go to your bus stop, your bus is there … So that's a tremendous value that essentially you are saying, you are giving people the time back.*

To enhance the transparency for the customers and to prevent the drivers from charging arbitrary prices, algorithms calculate standardized fares and shared this information with the customers and the drivers in the app. This information supported the decision-making for the commuters because they could rely on standardized fares or pricing schemes. The goal was to

provide a service that was fast, fair, understandable and inexpensive at every step. Trust Taxi communicated the changed service experience to its customers as follows:

> *Don't wonder where your driver is anymore, see his location in real time and pay consistent fair prices, regardless of conditions and time. Never argue with another taxi driver over prices; pay the same amount, day or night, rain or shine.*

Furthermore, all firms embedded the feature of community-based reviews into the service app. The CEO of Motorcycle Taxi highlighted the value of the "social feedback system" as a critical feature of the service to stimulate trust because it created an unprecedented transparency for both clients and drivers. Customers could "… see for the first time who they are actually driving with and how this person is rated by the community based on previous transaction", as one manager of Motorcycle Taxi noted. The CTO of Motorcycle Taxi added: "So, if the service was bad, we can have accountability because we promise to our customers that they get paired with good drivers only, while we take bad drivers off our system." After each transaction, both the rider and the customer were invited to give feedback, which, over time, created a user-based transaction history on the platform. This allowed the innovators to sense if the service performed well or whether they had to take action. The databases of the transaction histories were regarded as a core asset for these digital services to function as they incentivized a risk-taking behavior on the side of the customers, who were provided with community-based ratings, and, thus, could engage in more trustworthy transactions outside of their personal trust network.

Furthermore, addressing the huge trust deficit involved validating the drivers. For example, Delivery Service claimed a bundle of different documents from their partners (drivers), such as a "… national ID or passport, a valid driver's license, a motor vehicle insurance, a motor vehicle logbook and a proof of ownership." Yet, the problem was that most drivers were often not officially registered, and, thus, could not provide these requested documents. To compensate for the lack of formal identity and credentials, Trust Taxi, Motorcycle Taxi and Bus Shuttle thoroughly validated the little information that drivers could provide and stored all available information, including digital copies of analog documents, in the platform's database. The CEO of Trust Taxi described the procedure of on-boarding drivers as follows:

> *We send one of our driver community managers to meet with independent drivers or a small firm, we'll collect all their documents, screen them, validate them, things like this. We do collect credentials, as much as I said earlier that we don't believe that credentials are really worth all that much, we still do collect them and save them in our system because part of it is liability, it's due diligence, even if these*

> *things don't actually mean so much at the end of the day. So, we go through all of that, we'll get them on-boarded, we'll train them, we'll give them our software. And then we start working with them.*

The other firms in this study also asked for "police reports", ran "psychometric evaluations", vetted "social media profiles" or performed "address verification". Any gathered information was then transferred to the platform. By aggregating this unprecedented amount of personal data and information, the innovators gradually began to accommodate institutional functions. Hence, they found ways to compensate for the lack of business supporting institutions, such as registrations and licensing offices. The CTO of Motorcycle Taxi described this as the process of formalizing the informal sector:

> *Over time, we are able to get more granularity of the data that is collected. So, you have clear records of everything that is happening on the platform. You're formalizing somehow an informal sector to an extent that wouldn't be possible without the technology and the platform.*

Given the overall lack of sector-relevant information and market analysis, the CTO of Trust Taxi stressed the huge informational value in the data they collected on their proprietary platform. The CTO of Bus Shuttle, for instance, noted that the range of insights gathered on the platforms could support governmental infrastructure planning and policy-making:

> *Based on the data we've collected, we are able to figure out how the city moves, how Nairobi moves. So, we could give information to the government about all trips that had been made in a predefined zone, as slum areas or disadvantaged areas or places that are poorly served by current transport networks.*

Reducing Costs. The digital platform was also used to reduce the costs for all participants involved, especially transaction costs across all relationships. All services aimed at matching the riders and the ride seekers in an efficient and trustworthy way. This matching substantially reduced the transaction costs. Given the low disposable income situation and the high price sensitivity, all four firms had to find ways to reduce the costs for the customer. All respondents confirmed that price and costs were the main decision factors for customers whether to adopt a service or not. The CEO of Motorcycle Taxi noted: "It really took me by surprise. But people aren't concerned with safety, they deprioritize it to convenience and to cost. And safety is not something that people are willing to kind of treat as a premium." All founders described pricing as "tricky" and "intricate" because the innovators needed to balance out both the interests of

the drivers, who sought to generate higher turnovers, and the customers, who wanted to move around cost-effectively because of their limited ability to pay.

To get both sides on board, all four startups primarily sought to save operational costs by increasing "fleet efficiency". The CEO of Motorcycle Taxi described the rationale behind this strategy: "If you utilize them [drivers] more efficiently, so they have a higher take-home pay, then the customer pays less money per trip because basically the driver's increased efficiency allows the price reductions." To increase utilization implied providing more trips to the drivers, which, in turn, meant to stimulate the demand-side. Spurring demand in all cases involved extending the service portfolio by developing entirely new service concepts or targeting new segments. The CEO of Motorcycle Taxi gave the following example: "We do late-night-trips, where you wanna be with a safer driver. We do female drivers for female customers."

The costs for developing a new service layer were relatively low once the platform and core service had been established. All four startups also designed service offerings to target corporate customers due to their higher paying abilities:

> *So, we do B2B, corporate trips, this is like trips where employees of companies take motorcycles to get around and they want to have a clear accounting. These trips are higher priced than regular trips because they compensate for the lower prices paid.*

From the perspective of the founders, this 'cross-subsidization' was important to cater to the clients with a limited income, while maintaining the viability of the service in the aggregate. The profit to be made concerning the better paying customers was then reinvested to compensate the lower prices that were paid by the customers with less money. The CEO of Trust Taxi noted: "Changes in the software could be realized at very low costs." For instance, once the core delivery system was established, derivative service offerings (value propositions) could be developed at a very low cost because existing platform capabilities, such as 'payment' and 'dispatching algorithms', could be recombined with other capabilities to create a new value proposition with less effort. The CTO of Bus Shuttle said: "The digital platform technology is both the differentiator and the enabler for intelligent business solutions in Africa that had not been possible in the years gone by."

Even though all founders recognized the great potential of targeting the low-income segment, they primarily focused on the middle-income and upper-middle class to "start operations", "train algorithms" and build a resilient technology and business model, whereas targeting the

BoP was planned for the later stage. The CEO of Motorcycle Taxi explained this strategic orientation:

> *Right now, we are very much middle class and upper middle class. People who take motorcycle taxis, in general, are a middle and upper-middle class by Rwandan standards, someone who makes maybe like three or four dollars a day. But these are professionals who want to get to work on time, so commuting is probably our biggest purpose in transportation, and people who want to go home from bars and restaurants and at night wanna have trust. So, we are targeting people who are a step above the normal motorcycle taxi user would take, but still somebody who just has fulltime access to the vehicles … I am very ambitious to know how people down the pyramid think we can go for the next two years. It's not our purpose to make a product that is just for the middle class and the rich.*

Bus Shuttle, Motorcycle Taxi and Delivery Service confirmed that the digital platform technology had been the key enabler for reducing the costs because it allowed "increasing the resource efficiency", "streamlining the procedures", "gathering the data and information" and "designing new service layers" efficiently. As the CTO of Motorcycle Taxi noted: "By aggregating business functions, we think we could improve the drivers' productivity by 20-40 percent. And this allowed us to offer competitive prices."

Stimulating Behavioral Changes. Seeing drivers as a major safety hazard in transportation, the digital platform capabilities were leveraged to stimulate behavioral changes by redefining rules to improve the service experience for the customer. The startups paid special attention to the design of the physical touchpoints between the customers and the drivers. This was important because the service encounter was "the moment of truth", the moment when customers and drivers interfaced and interacted with each other. To create an amenable service experience, they had to address "careless driving" and deceitful orientation often displayed by the drivers. To change this harmful behavior, all startups defined and established a set of rules for this group of partners and leveraged digital technology for monitoring the behavior. In operational terms, they pulled sensor data from the drivers' smartphones to control deviations from the pre-defined rules and terms. Motorcycle Taxi paid particular attention to "acceleration, braking and speeds", as the CTO stated. He further explained: "The data is then analyzed and used to give drivers a score out of a hundred. They must score at least 90 to keep working with the company."

These control mechanisms came into play because the innovators made the experience that they could not be confident that the drivers would "keep their word" and drive according to the established safety rules. For example, Motorcycle Taxi established a penalty system inspired by soccer in which "drivers that are 80-90 percent compliant receive yellow cards, while those below acceptable levels received red cards and had to serve a one-day suspension in the 'penalty box'." This type of continuous monitoring allowed the firm to take action if the goals were not met. At the same time, these penalty systems served as a compensating mechanism for the lack of formal rules and norms in the local settings and to regulate the behavior in the streets. The CEO of Trust Taxi noted: "We cannot rely on a robust institutional system, such as in developed markets. You have to build everything on your own, if you want to be successful with your service here." Motorcycle Taxi was quite successful in improving the driving behavior of their drivers: "We are proud of it that safety is actually something that we've been quite on point in terms of that we have done more than 400,000 trips with no serious accidents to our names."

Another strategy to promote certain behaviors involved the standardization of workflows to enhance the performance of uneducated workers, for instance, establishing standardized procedures "… to ensure a standardized service experience for the customers." To do so, the innovators had to break down key duties and tasks to concrete "easily understandable steps", which the riders could simply follow on their screens when going on a ride. Motorcycle Taxi, for example, developed a so-called digital checklist:

> *A big thing I've been working on with my colleagues, like basically trying to do a McDonald's style automation of processes because like again this problem with human resources and partners means that you can't kind of rely on doing their jobs properly. Seems that we basically have like a series of every employee or partner has an automatic task list to say. It is like checking things off very methodically and it kind of bothers me because I feel like it's kind of a robotization of work, but at least at the countries I am operating in, people already like it. It seems that they like the idea that there is a clear direction and clear deliverables and you know they exactly know they are doing their things properly.*

While digital instructions were helpful for the service delivery process, intense training sessions to teach drivers how to create an amenable service experience for the customer and how to communicate with the customers, were found equally important. As Trust Taxi noted: "At the beginning drivers had no service mentality" and often could not conceptualize "what is expected in terms of service level." To reverse this situation "drivers go through an extensive

training to make sure that they have great customer care and give customers a delightful trip experience."

5.3.2 Integrating into the Socio-cultural Environment

Leveraging digital platforms, however, has not been enough to respond to the various constraints and to trigger a sense-making process of the actors to change their behavior regarding the service exchange and to increase the adoption of the service. The innovators had to take the digital services one step further. Instead of implementing the service, they had to integrate it with the socio-cultural environment. A second category of practice in response to the complex web of constraints focused on activities of interweaving the digitally enabled service with the socio-cultural environment. This was important to raise social approval and legitimacy. These activities required social skills and were collectively labeled as integrating in the socio-cultural context. This involved demystifying the service and synchronizing it with established routines and standards to successfully operate in the local environment.

Demystifying. Demystifying included all activities and actions which aimed at diminishing or eradicating complexities and ambiguities attached to the service. One strategy to demystify the service involved simplifying the user interface. The CTO of Trust Taxi explained that local users often "lack the comprehension" and "absorptive capacity" to use apps effectively. Thus, they had to reduce the complexities attached to the user interface. The CEO of Bus Shuttle noted: "The user interface needed to be as simple as possible to increase adoption of the service." Motorcycle Taxi rapidly programmed an app by adopting the style of a Western-based service app, yet, made the experience that users and drivers alike felt cognitively overloaded with this first version of their mobile app. The respondents reported that users often had issues with navigating through the app and asked questions, such as: "What do I do next?", "How do I position myself on the map?" or "How can I close the window?"

Misunderstanding the instructions depicted on the mobile interface put the fate of the service at risk because it prevented the users from deeply engaging with the app and, eventually, might drive them away. Hence, facilitating the "in-app navigation", "organizing the app according to the local users' logics" and "cleaning up the visual design" were crucial and involved diminishing "complex screens instructions" and reducing the overall number of steps to create an amenable service experience. The CEO of Motorcycle Taxi exemplified how they addressed this problem:

> *So, you know we are basically doing a design language from scratch that takes into account not the way you design an app for like a Western user base, but for a user base that doesn't have a legacy with technology. And it's interesting if you look at our application. Quite often the first thing what a foreigner says is: 'How ugly.' Because it's not designed for Western audiences.*

Simplifying the user flow implied adopting the taken path for completing a task by a prototypical local user in the app. This was important to increase the adoption of the service app. The CEO of Bus Shuttle emphasized the importance of removing any potential barriers in the app: "So you cannot ask users for their e-mail address in the registration process because they do not use e-mail at all. Instead, we asked them only for their phone numbers to get registered."

All four startups paid attention to increase their visibility and to provide information to demystify the service. The goal was to ward off any questions and misconceptions about the service. They figured that the widespread lack of trust, combined with limited technological comprehension, were major hurdles for a successful service implementation. Thus, frequent in-person interactions with the users, providing information and "showing face" to the local audience was found to be a crucial and an effective strategy to contribute to demystifying the service. As the CEO of Bus Shuttle stressed: "People often cannot conceptualize what digital technology is, how the Internet works, how telemetry works, so you spend a lot of time, explaining all those things." An increasing visibility at major touchpoints helped to unscramble things and "reduce distrust" and negativism often attributed to services in the local sector. This is the reason why they not only set up the driver network, but also had agents "on the ground" that provided support and information. The CEO of Motorcycle Taxi described the value of, so-called, "Red Bull-style street teams": "The street teams were extremely effective for us, not just to raise awareness for the service, but actually they sit down, install the app and explain people how to use the application."

Similarly, the CEO of Bus Shuttle underscored the value of a physical agent network that support the driver network:

> *You can have the most beautiful website that has the best technology that can accept payments even in Bitcoin, but if you don't have a distribution system by way of agents on the ground to help customers in the last mile fulfilment, then there is nowhere where your beautiful technology is going. So, the single thing I would say about the deployment of digital solutions in Africa would be a physical distribution network.*

These agents helped to install the app, explain the menu, register the user and explain the overall functionality (Why is it better compared to other services? How to navigate through the menu? What are the benefits?). In addition, all founders agreed that the presence of the big competitors was helpful in demystifying the service, as their high media attention created a base for better understanding the functions of the service. The CEO of Delivery Service explained how the service benefitted from the success of the diffusion of taxi apps:

> *When we first launched, we had to do a lot of things to change behaviors. Now, I can walk into a sales pitch with a business individual and say: "Do you use Uber? Do you use Taxify? Oh, great! We're similar to them, but we move packages instead of people." It instantly changes their mindset and puts them in the context of "I know how this works and I like Uber. I like Taxify. I think I'm going to like Delivery Service!"*

To increase visibility and awareness of the new service, the firms used consistent branding and were engaged to set up a standardized fleet of vehicles. All startups, thus, specified acceptable vehicle types to join the platform. Motorcycle Taxi illustrated the standardized driver equipment:

> *So, we provide for free for drivers branding, like a branding kit. Like a flag, stickers, things like this. But then drivers need to purchase a favored helmet from us and come with a smartphone and come with a certain type of motorcycle. However, if they don't have a smartphone and they don't have a motorcycle, we have a collaboration with a local bank, ways for them to access financing to get either a smartphone or a motorcycle or both. So, we actually have a package that has a smartphone, helmets, a motorcycle that basically allows a driver to join us with a complete kit.*

To better integrate the service in the socio-cultural environment and to dispel the mysticism about these new digital services in the local transportation sector, the innovators also engaged in co-creating narratives with the users and other stakeholders. It was found helpful to cultivate the meaning and the need for improved transport services, and to facilitate the understanding. The innovators acknowledged that digital services still represented complex artefacts, attached with many queries, which local actors are still "trying to conceptualize".

Hence, depicting an improved reality in the transportation sector by using narratives has also been helpful to improve the perception and the value of the new service. For example, the CEO of Motorcycle Taxi noted that sharing individual success stories of their drivers on social media

and on their website was also effective for attracting new drivers. They frequently referred to the story of the proud motorcycle driver Fred H.:

> *I have driven for the company for more than a year. It's been life-changing for me and my family. Now, I sometimes make twice what I did when I drove on my own. With the money, I bought a new house and sent my children to a private school.*[597]

Entrepreneurs also co-created narratives with other entities of the broader service ecosystem, e.g., when interacting with the regulators and informal competitors to enhance the legitimacy. To co-create a narrative that attracted the attention of public authorities required understanding their needs and goals. The CEO of Bus Shuttle explained that incorporating the Sustainable Development Goals (SDGs) in the narrative, especially those goals associated with education and employment, was important to be considered for support or potential partnerships. The CEO of Motorcycle Taxi summarized:

> *And the best way to kind of typically handle government relations is you are not talking about the business you are talking about the story, the way the government wants the story to be and you are a mechanism of facilitating the governments goals in kind of a public domain.*

In addition, thoughtful interactions and communication with local competitors were crucial to dispel the threat of disruption, which especially informal actors feared. This narrative referred to the typical struggles that service providers commonly experience in the local business environment. The CEO of Bus Shuttle also emphasized the role of tactfulness and communication skills when engaging in a discussion with informal players:

> *You must have a very tactful ground game in terms of how you are interacting with other players, who know that there's probably disruption coming, and they don't know how to handle this. So, you must be very tactful about how you go about it. The regular things as harassment by police as your vehicles are on the ground, but for some of those you just take a strike and make sure that you got the ability to talk through literally anything and everything.*

Synchronizing. Another vital activity to integrate the service into the socio-cultural context involved synchronizing the new service practice with established social practices and technological standards so that people would feel more familiar with the new service offering.

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[597] See Appendix 15.

One example involved the acceptance and integration of cash as a possible payment option to reinforce the service adoption. The CEO of Trust Taxi elucidated the logic behind it:

> *We accept payments via M-Pesa as well as the competing mobile money product from America. And we also accept cash. This is on this continent, if you are working with a mass-market product, good luck, if you're dreaming of doing it without accepting cash and so we were figuring out how to accept cash.*

Similarly, the CEO of Motorcycle Taxi noted: "For now, users can pay with cash or debit/credit card because Kinshasa is still early for mobile money. But of course, we plan to include a payment platform going forward."

Furthermore, the limited availability of smartphones with an active mobile Internet connection had been a key bottleneck for implementing and scaling the service. To enable large-scale access to the service despite this constraint, innovators also incorporated rudimentary technologies, such as USSD-based menus. These technological standards would be considered outdated in the developed market context, as the respondents noted. Motorcycle Taxi described this shift to using basic cell phones:

> *We're doing a big investment into technology so that the service is very easy to onboard new users and obviously provides them value … As a customer, you can either use a smartphone to order or you can call a dispatched agent, who will basically do an old-school taxi service and dispatch a driver to you or you can use a USSD menu for state places from your past trips and ideally we're gonna set this up as a funnel to try to push people over time to the smartphone because this is the cheapest and most scalable way for us as a company. We don't want to have smartphone penetrations to be the limiting factor for what our total available market is.*

The startups learned that despite the rapid penetration of mobile networks and the availability of cheap smartphones, low-tech solutions were indispensable to reaching out to customers in African cities. Employing these easily accessible and cost-effective technologies was found to have several advantages, such as providing an inclusive solution and promoting rapid diffusion. The CEO of Motorcycle Taxi noted: "Our current strategy is to go into tough markets like Kinshasa and expand beyond smartphones to feature phones."

Another example of synchronizing the service with established socio-cultural routines and norms referred to harnessing personal referrals as an effective trust mechanism in the trust-deficient environment. The CEO of Trust Taxi stated:

> *People will not trust those decisions and those purchasing decisions of services in the yellow pages or an Internet directory or any of this. They use their existing networks, their personal networks to find the services that they need. It's all based on referrals. And that's why referral codes were extremely effective for us.*

In contrast, Intra-City and Inter-City Carpooling paid less attention to interweaving the new service with the socio-cultural environment. Both services represented culturally uncommon practices that, in addition, were associated with high trust and safety risks for both users and riders. As the CEO of Intra-City Carpooling said: "Even though our ride owners come from the point of empathy and see the whole traffic situation, they were scared because they didn't know who they were driving with." Furthermore, the usage of Intra-City Carpooling was inconvenient because it was only bookable on the website. Integrating low-tech solutions, such as USSD, has been omitted.

5.4 Multidimensional Value Creation

Both leveraging digital platform capabilities and integrating the service into the socio-cultural environment contributed to multidimensional value creation. First, it built a context of trust as a support infrastructure for the service to function. Second, they not only created a substantially improved service experience but also created social value with the introduction of the new service.

5.4.1 Emergence of Trust

When the innovators entered the transport sector, they found an industry plagued by a severe lack of trust, made up by a variety of issues in the institutional system. The founders encountered customers that were suspicious and skeptical towards the new services, while the innovators themselves could not be confident that their partners would behave faithfully. Overall, the lack of trust caused a major friction between all the participants in the transport ecosystem of dealing with each other effectively and easily. Rebuilding this lost trust, thus, was important for reducing the transaction costs between those actors and eventually for the fate of the service.

To restore this broken trust, the innovators highlighted ‘transparency’ and ‘reliability’ as complementary values to cost-effectiveness and ease-of-use. The innovators’ primary focus gravitated around leveraging digital platforms to install a set of trust-enhancing mechanisms. For example, to create more transparency for the customers, an automated information and an instant confirmation, especially regarding the price and the arrival time, were provided in real time. The CEO of Motorcycle Taxi noted that for the first time, customers could build confidence in a service because when travelling, they no longer needed to accept inconsistent prices claimed by the driver. The CEO of Delivery Service said: “And we are happy to see our customers enjoying the new service and all the information they get.” Providing real-time updates and information contributed to the process of trust formation.

Creating an improved service experience was critical for the success of the services to ensure recurrent interactions and to build a positive reputation. One customer of Trust Taxi described the service experience like this: “I often doze off when I am taking Trust Taxi without being scared of getting robbed because I trust the drivers and the service.” The goal was that the customer feels that the trusted person, in this case the driver, will make every effort to fulfil the promised value proposition.

Therefore, regulating the behavior of the drivers was equally important to transform previously negative service experiences in the transport sector. The CEO described the typical service experience as it had existed before:

> *Before, independent drivers typically negotiated their own rates and maximized their earnings by transporting as many customers as possible each day. But the customer experience never mattered because only speed was relevant to the bottom line.*

To monitor the driving performance, the innovators leveraged the digital platforms to establish a traceability system, where both the sensor data and the customer reviews flowed together to create a profile of the driver.

The digital platform also created an unprecedented transparency in the collaborative value creation with local partners because it exactly displayed “who contributed how much” and allowed an honest and unbiased sharing of the created revenue. This was critical for a successful collaboration because it compensated for the lack of legally binding contracts. The CTO of Bus Shuttle underlined: “We can have this transparency with our partners because the platform provides consistent data on everything.”

However, the trust-facilitating mechanisms enabled by the digital platforms were not enough to gain trust from the local community. The local society was still at an early stage of technology adoption. The innovators learned to embrace this situation and explored different ways to carefully embed the solution into the socio-cultural context to gain the community's trust. They engaged in an intense interaction with the users and various stakeholders to demystify the service by detaching any kind of uncertainty. In addition, they aimed at synchronizing the service with established cultural and technological standards. "The customer needs to have the feeling of: 'Oh, yes I know how this works'", the CEO of Delivery Service noted. Leveraging social skills, such as communication skills and being empathic with the local context, were vital to gain social approval and legitimacy, as the founder of Motorcycle Taxi stressed.

In addition to building a new service, the innovators explored multiple ways of how to build a robust web of trust in which the service could function. The CEO of Motorcycle Taxi aptly described the startup's role as an "aggregator of trust in a low-trust environment" because they were plugging multiple trust voids. Similarly, the CTO of Motorcycle Taxi noted: "So, what happens is that you are kind of building a trust system behind the scenes to make the service work." Together, these mechanisms, which consisted of both digital and social components, wove a web of trust between the firm, its customers and its stakeholders. The innovators frequently described this trust-building process with expressions such as "going the extra mile" or "taking the service one step further" because they could not rely on a trust-enhancing institutional foundation. Simultaneously, they acknowledged that trust formation is an indispensable part of successful service development and a great opportunity for building a competitive advantage in these environments.

The respondents also referred to the time component of trust. For example, the CEO of Motorcycle Taxi described the emergence of trust as a lengthy process: "Building that trust takes time – actually many years." Trust was also described as a dynamic phenomenon because it can change. Hence, they made decisions "about every strategic step very conscientiously" because every decision and action could either add to the emergent foundation of trust in the service or could erode the base of trust that had just been built.

5.4.2 Multidimensional Value Proposition

The innovators tackled multiple value creation dimensions, not just for the intended users, but for the whole ecosystem of actors. Hence, their efforts created customer value through a new service in the deficient transportation sector and social value.

Customer Value. The innovators launched the new service to provide substantially improved transportation services. The primary goal was to offer a "cost-effective and easy-to-use solution", which, overall, improved the "people's ability to move around the city". The services were primarily designed for urban travelers who suffered from an inadequate and unaffordable supply of public transportation and logistics services. Cost-effectiveness was considered the all-important parameter of the value proposition since customers were extremely price-sensitive. To reduce costs and make the service affordable, the innovators leveraged digital platforms to minimize the fixed costs, to increase the vehicle efficiency and to develop creative business models (cross-subsidization).

Another vital dimension of the value proposition involved the ease-of-use of this new service. The simplified design of the app and the incorporation of additional channels, such as USSD, lowered the barriers for the service adoption. The design of the app was adapted to the needs and the level of education of the local society. Because of the high levels of illiteracy, it was necessary to design services in a way, so that they could be learned easily and used without problems.

Social Value. However, these new services not only delivered value for the end-customers, but also provided social value for other groups in the local ecosystem. These innovators did not aim at merely serving the end-customers, but also sought to introduce new structures and to inspire reform and change in the social system they were operating in. For example, drivers benefitted from a higher asset efficiency and the access to financing. Financial institutions, such as banks, benefitted from an unprecedented transparency because the platform allowed them to qualify adequate candidates for credit, while vehicle manufactures benefitted from increased sales due to the new business model. These new value relations would not have been possible without the digital platforms, that enabled the emergence of this service ecosystem.

Beyond an increased business value, all the founders focused on creating socio-economic value and were often guided by SDGs. The CEO of Motorcycle Taxi listed the various SDGs they pursued:

> *We work towards multiple on the United Nations Sustainable Development Goals, including building a safer taxi experience (SDG 11), developing a local technology industry (SDG 9), increasing the taxi drivers' economic productivity through technology (SDG 8) and enabling females to become taxi drivers (SDG 5).*

The creation of new employment opportunities[598] was a major goal on the innovators' agenda, like the CEO of Bus Shuttle explained:

> *We have a very keen eye on youths, passengers with disabilities and women, in terms of empowering them. Youths will require the jobs, they are able to do the driving jobs or the cabin crew jobs, both for young women and persons with disabilities giving a decent wage.*

Motorcycle Taxi and Bus Shuttle also enrolled women as drivers to support female empowerment and equality. The CEO of Motorcycle noted:

> *Becoming a moto-taxi driver is a way for many people on a step towards economic empowerment, and we firmly believe that this should be available to everyone in Rwanda, not just men. We are now working with an additional cohort of 40 women, putting them through training over the coming months to launch a dedicated female moto-driver and customer product.*

A manager of Motorcycle Taxi said that this work achieved more than just female employment. "It also concerned a cultural shift", she emphasized, because it was changing the perception of men and women in Africa.

By leveraging their new service systems, all four founding teams shared the common desire to generate socio-economic impact and drive change in the chaotic, largely informal, transportation sector, where various imbalances existed. As the CEO of Bus Shuttle underlined: "If you develop a solution for these markets, you are trying to absorb as many problems as possible." The new service systems were described as "open systems" that continually sensed new problems which they were seeking to solve by reconfiguring resources to dissolve issues in the social system.

Despite this human-centered and pro-social orientation, none of the founders perceived their business as a social enterprise. They rather focused on doing "good business" and creating value for all. The CTO of Trust Taxi explained this idea:

> *And we don't market ourselves as a social enterprise to any extent. And not because we don't believe that we are bringing social impact, but because the words "social enterprise" are incredibly loaded and mean different things to different people and*

[598] See Appendix 15.

> *so we just stay away from this. And we're very comfortable that we don't even need to talk too much about this just because we think we have stronger selling points in terms of just purely our value proposition to the client and to the driver … But what I actually see in our service it is just a good business.*

5.5 Pattern: Designing for Multidimensional Value

Looking at the various constraints and the activities from a meta-level perspective revealed a capability of how to develop and implement new services under constraints of scarcity. All four teams developed a complex and fine-grained understanding of the various constraints prevalent in the local business environment. They listed numerous constraints across different categories, and, correspondingly, performed a complex set of actions to respond to these limitations. For example, to overcome the customers' income constraints, they introduced new service concepts, which cross-subsidized fares and enhanced the vehicle utilization and eventually increased daily turnover for the drivers. In response to the safety and trust issues, the innovators stimulated behavioral changes through a comprehensive traceability and incentive system. To facilitate access to the service, they leveraged rudimentary technology and provided USSD-based solutions. Hence, the innovators continually re-designed the new service by responding to constraints. Thus, the process was dynamic, iterative and continuously at change. The respondents also referred to the temporality of the design activity by using terms, such as "continuous adaptation" and "on-going refinement". The CEO of Motorcycle Taxi noted that it was like being permanently in the beta stage because the desired end-state of the service remained unknown.

The study showed that constraints emerged over time that could not have been known at the outset of the service development process. This means that it was impossible to completely pre-specify the service or to adopt a proven service template originating from developed countries. The CEO of Motorcycle Taxi described how they failed with their initial approach:

> *Our product started off very simple when we launched in Kigali in 2015: Let's take Uber, pair it with motorcycles, shove in some sensor telematic tracking and boom, have a product where we would take a percentage cut from every trip. We pretty much immediately fell flat on our face and so began our journey of understanding the consumer behavior and infrastructural issues in this region.*

Similarly, the CEO of Bus Shuttle noted:

> *It's hard to go to Africa and think you can build this one service layer and then expect the rest just to function. In Europe, you have a well-functioning infrastructure, then you start putting a layer of services on top, like a marketplace. But here, you need to build everything yourself, otherwise the end-experience of using the service will be crap.*

Furthermore, once they responded to the identified constraints, new constraints emerged. These dynamics, combined with the complexity of the local conditions and the interwoven nature of various constraints, that in addition had a different temporality, made the innovators shift their thinking from focusing on addressing the core problem to minding the complex web of constraints. This shifting focus triggered an array of design cycles. Hence, a key insight was that the service development process was reflected in the activity of a continuous design for value and not in following a formalized service development process, where the service was designed according to what it had already been conceived of.

Designing for multidimensional value was an explorative approach to service development, where the innovators constructed an understanding about what needed to be designed with and for their end users and other stakeholders. The major goal was to provide a substantially different customer experience, "something that people love", as the CTO of Bus Shuttle explained. The CEO of Trust Taxi described the explorative nature of the service development as "the most complex puzzle" in his life, where he tried "to figure out like to put something in someone's hands and make it a pleasurable experience, that gives them value."

The founders metaphorically described this meta-activity as "bringing the pieces of the puzzle together". It was an iterative process during which they conducted their research, developed insights in the local use cases and generated entirely new concepts. Hence, design was not an isolated phase in the service development process which was completed before testing, rather these innovators were continually in the process of designing to improve the situations for society by creating new value relations between diverse actors to, ultimately, lead to a multidimensional value creation. Thus, designing can be considered a meta-practice to the overall service development process because the innovators in this study were continuously involved in detecting issues, iteratively planning and constructing the service system, which then delivered a valuable service experience.

The founders described the service development and the implementation as a human-centered practice in contrast to a technology-centered approach, which involved deep user research. The CEO of Motorcycle Taxi commented how they began to abandon pre-conceptions of how things should be done:

> *We thought we knew the African consumers. My co-founder is Kenyan, I had some experience in the local environment and our team is all Rwandan, should be easy! We were off by multiple orders of magnitude. So many of those design best practices we borrowed were just glaringly misguided. Here is when we decided to not "build to best practices", but to "build to the users". What we hadn't adequately considered was that we needed to build for the real consumers in our markets rather than some ephemeral hypothetical 'ideal' user. I personally led more than a hundred hours of user experience testing and right from the get-go was humbled to the point of embarrassment.*

To gain an in-depth understanding of the users' needs, desires and major "pain points" and to decode the local decision-making, this explorative process involved extensive ethnographic research. They spent long periods of time on the ground, observing the customers' behaviors in their real-life contexts, tested existing transport services and repeatedly engaged in dialogue with the users but also with various others stakeholder, such as drivers and fleet operators. Motorcycle Taxi underlined the importance of human-centered thinking to adequately apply technology:

> *I would really think that if there is one thing than could kind of unlock this region to a company in a way will have like disruption, it's not going to be technology for the sake of technology, but rather finding ways to really understand the users and their use cases and what their lives are like to make a product step, you know integrate in an efficient organic way.*

The founders developed a deep understanding and framed problems and opportunities from a human-centered perspective, continuously engaging potential users and stakeholders in the service development process. The CEO of Bus Shuttle described the first explorative phase:

> *There was a time when the entire team took the public transport for six months for the sole reason of confirming or dismissing our first assumptions. Repeated self-experience was key, not only focusing on what we are doing as a firm, but what we are feeling as consumers.*

The CEO of Trust Taxi noted that becoming embedded in the local setting was crucial to understand the subtle but vital factors and to "come up with a relevant service concept":

> *And I think if to truly understand the magnitude of the difference between a ride, a nearby ride, and a personally trusted nearby ride you have to live here, you have to be of this market or of this place to understand that local psychology, when it comes to lacking service providers and how people make their decisions.*

Underpinning this human-centered design was the empathy through which innovators derived an accurate interpretation of the problem the end users faced. It enabled the innovators to spot relevant struggling moments and emotional markers, such as anger, frustration, distrust and anxiety and to derive critical implications for the new service concept. Drawing on these insights, Motorcycle Taxi and Trust Taxi also generated entirely new service concepts in addition to their core service. The CEO of Motorcycle Taxi pointed to the value of the user research: "I am not aware of any company in Africa that seriously does user experience testing and deep-user research, and I think that gap is unfortunate but also an opportunity." He further elaborated:

> *It is a lot of mental gymnastics but it is extremely interesting, too, because I don't think there are too many people actually respecting the African user to actually make a technology that kind of fits their needs where they are today and it's also a lot of fun.*

In contrast, Intra-City and Inter-City Carpooling focused on a set of problems at the beginning of the service development, they were about to tackle. They complained about context factors, such as the low enforcement of rules, corruption, poverty and market readiness, but did not incorporate these problems explicitly into their business logic and service system. They had the concrete aim to introduce a service inspired by Western-based solutions. Hence, the desired state-of-affairs was known at the outset so that they could design a service according to the specifications they had made, and, thus, were able to follow a more systematic procedure. This service development approach rather represents a technology-centered practice. Hence, they did not pay much attention to latent but significant constraints, such as the lack of trust and the digital illiteracy of the users. Rather, they clearly focused on addressing the core problem – the limited supply of efficient transport services – by leveraging the digital platform capabilities to deliver a new transportation service. To do so, they built a match-making platform for riders and ride seekers, inspired by Western service templates, to reduce the costs for both sides. They concentrated their actions on building the supply- and demand-side of the platform and

integrating multiple partners to create additional incentives for the members of the platform, and simultaneously increase the business value of the platform. In sum, the two firms reproduced a service originally designed for the Western audience, and, thus, had issues growing the customer base because it conflicted with existing socio-cultural practices, hampering the scalability of the service.

6 MODEL: DESIGNING FOR MULTIDIMENSIONAL VALUE

This chapter presents the midrange theoretical model from the case-based, empirical evidence and its respective components. Subchapter 6.1 provides an outline of the model, before the core elements of the model and the identified relationships are described in the subsequent subchapters (6.2-6.6), according to the aggregate dimensions identified in this study.

6.1 Presentation of the Model

Up to this point, the study described how innovators experienced the various constraints that have surrounded the core problem of transportation poverty and how they acted and interacted with these constraints to create a new service. It demonstrated that innovation activities and practices in an emerging market's complex societal setup seemingly depend on multiple contextual contingencies and constraints, which must be suitably incorporated in the theorization. Combining these insights with literature leads to a competence-based model, namely "designing for multidimensional value" as depicted in Figure 14.

This capability can be considered a dynamic capability because the innovators in this study have been in a continuous cycle of designing due to the multitude of problems, they encountered along the innovation journey. This means that whenever they stumbled over a hole in the institutional infrastructure, the team devised and pursued actions to fill these holes, all the while developing a wide variety of mechanisms to support the service to function. All innovators were driven by the desire to substantially improve the situation in transportation in the metropolitan areas by innovatively designing contextualized, yet, economically sustainable, solutions. These new services represented new social practices, that involved a change in the way how humans interact with each other to create this substantially new service experience, which was facilitated by leveraging various interdependent digital technologies and devices.[599] But this study illustrated that technology was not sufficient to promote the generation and the diffusion of a service innovation; non-technological factors were at least equally important. This finding highlights the relevance of the social dimension of the service innovation process and the social skills and competences of the innovators needed to develop and implement these services successfully, so that they were beneficial (value experiencing) to the actors in the local context.[600] Innovating with these new artefacts of modernity in an institutionally volatile

[599] Cf. Meroni & Sangiorgi (2011), p. 11.
[600] Cf. Edwards-Schachter (2018), p. 66.

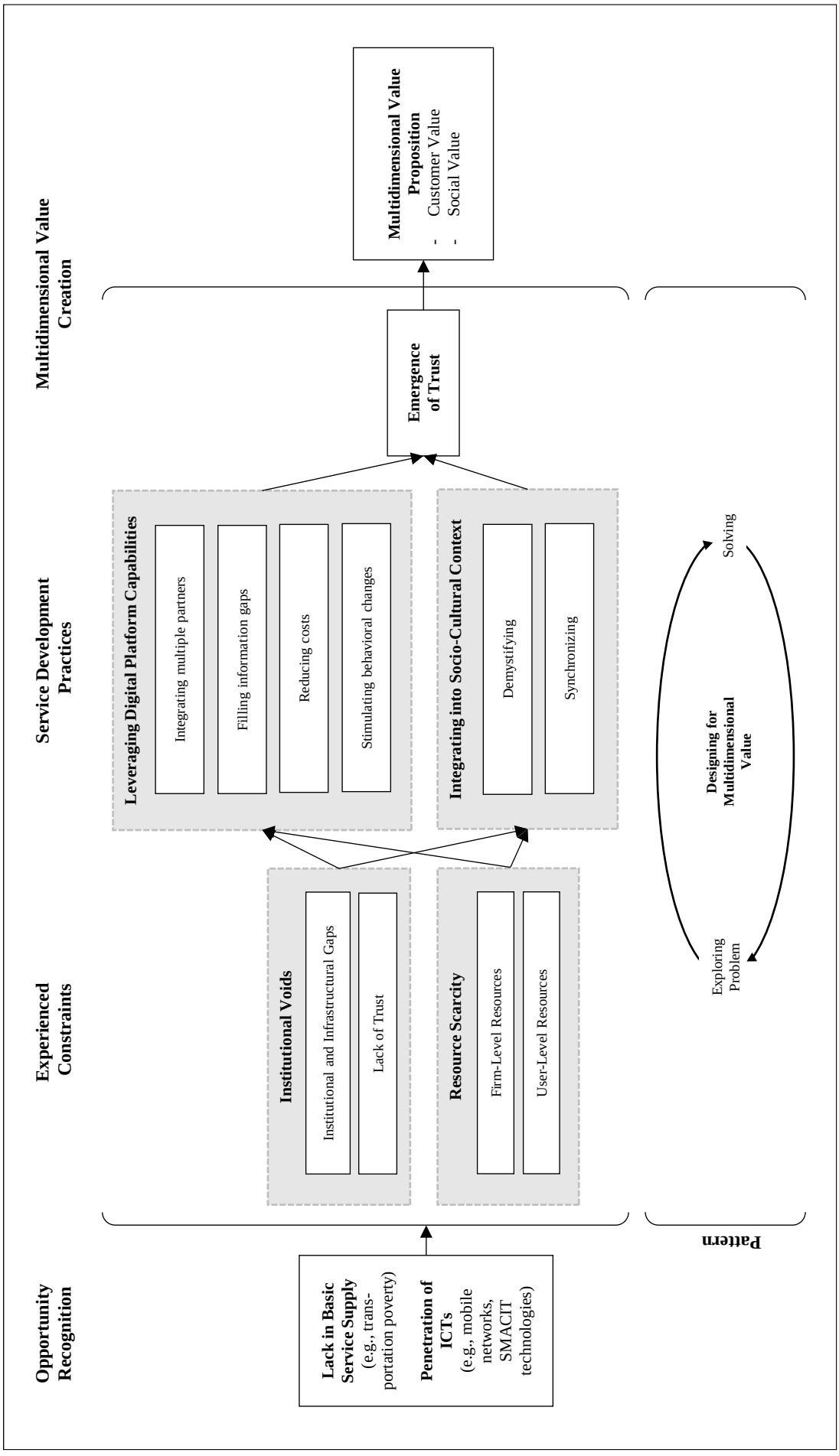

Figure 14: Model: Designing for Multidimensional Value

Source: Own illustration.

environment that, in many parts of these economies, is still agrarian, requires a different approach to the development of new services, one that goes beyond pursuing a linear model of service development and in which design plays a crucial rule.

Hence, this study proposes to regard innovation in uncertain environments as a complex design project that results in a systemic solution providing multidimensional value to the society. This new service system was continuously at change as it absorbed the problems that crossed its way by designing solutions to dissolve them. Eventually, design cannot merely be viewed as a distinct phase in the service development process. Instead, it is identified as a meta-practice, necessary for the service development and the implementation in constrained environments. It is based on the assumption that problems in the emerging market context cannot holistically be anticipated at the outset of the service development process. Rather, innovators need to be open and flexible towards emergent problems, explore them in depth and develop adequate solutions. This chapter will develop the model (Figure 14) in more depth.

6.2 Recognizing the Lack of Basic Service Supply as Opportunity

In many emerging market economies, governments do not have adequate resources to provide basic services to the society at large. Transportation is one example of a basic service insufficiently supplied, and, thus, impeding a social and economic development. Existing transport services, often dominated by informal providers, are notably inefficient and marked with poor quality and safety hazards. Because of this inadequate supply of transport services, people cannot access key economic activity centers, including markets, employment, education and healthcare. This perpetuates situations of “limited choices” because people cannot pursue “valuable activities” that might improve the quality of their lives. These voids, however, are opportunities for entrepreneurs motivated to take on this task and deliver services that enhance these basic capabilities in an efficient way. In this vein, Sen adds that contributing to opportunity freedom by improving the capabilities of a person, so that a person experiences a better quality of life, is a key opportunity area for entrepreneurial engagement in developing economies.[601]

From the S-D logic, the service innovation aims to create novel resources that are beneficial (i.e., value experiencing) to some actors in a given context. To do so, the new resource needs to be integrable with existing resources (e.g., knowledge, financial resource, and products). This

[601] Cf. Sen (2013), p. 320.

means, it can never be used in isolation but needs to be integrated with other resources to achieve usefulness. For the case of new transportation services, the users can only experience value from the new service, if they have the adequate resources in the form of skills, digital literacy and mobile devices, which are necessary to integrate the new service effectively with other social practices. Hence, the focus on the process of serving the user has a deeper meaning.[602]

With the wide availability of ICTs in emerging markets, specifically mobile networks and a diffusion of affordable cell phones, combined with the emergence of, so-called, SMACIT-Technologies[603] (i.e., social media, mobile computing, analytics and business intelligence, cloud computing and the IoT), the local business environment has changed dramatically, providing new opportunities for firms and entrepreneurs to cost-effectively address these infrastructural gaps. The tech entrepreneurs in this study leveraged these emergent technologies to design new service concepts (value propositions), which involve greater safety, cost-efficiency and improve convenience for local users.

As Figure 14 illustrates, addressing this gap by leveraging digital technology brought a complex web of constraints, in which the core problem was embedded, to the surface. As a result, a variety of actions were necessary to be conceptualized and executed to solve the emergent problems in an explorative trial and error manner.

6.3 Experienced Constraints

Scholars argue that emerging economies are typically characterized by two major features: the persistence of institutional voids and resource scarcity,[604] both representing significant problems which adversely affect innovation and firm performance. Institutional voids can be described as the widespread lack of well-functioning institutions,[605] including intermediaries. flawed regulations and weak contract-enforcing mechanisms,[606] creating a complex and uncertain business environment for innovating firms. Resource constraints, on the other hand, refer to limitations in the availability of finance, skilled labor and technology (firm-level),[607] or

602 Cf. Lusch & Nambisan (2015), p. 161.
603 Cf. Ross et al. (2016), p. 1.
604 Cf. Khanna & Palepu (2010); Bhatti (2012), p. 9.
605 Cf. Mair & Martí (2009); Khanna & Palepu (2010), p. 6.
606 Cf. Khanna et al. (2005), p. 4.
607 Cf. Julian & Ofori-Dankwa (2013); Linna (2013), p. 3; Zoogah et al. (2015), pp. 15-16.

indicate shortages in income (user-level).[608] Responding to these constraints critically impacts the success of innovation.

While the findings in this study resonate with these two broad theoretical dimensions, they surface two vital sub-categories which refine the understanding of contextual constraints in emerging markets. First, the data in this study brought forth that the innovators not only operated in an institutionally volatile, but also in a low-trust environment left by the dysfunctional institutions in the local context.[609] This severe trust deficit created another significant constraint in the local business context with relevant implications to the service concept and the service development. Trust can be understood as the "generalized expectancy held by an individual that the word of another can be relied on"[610], as Rotters stresses. It is the foundation for a market creation. Yet, relying on another actor is problematic in these markets. People in these markets expect transactions to be exploitative rather than mutually beneficial, and, thus, tend to mistrust each other. The widespread lack of trust manifested itself in skepticism regarding transactions and in a general suspicion of a dishonest behavior of the other. Similarly, people were described as neither trusting public authorities nor the government. Existing research argues that the absence of trust is viewed as disincentivizing any form of risk-taking behavior, therefore, entrepreneurial involvement can be expected to be low in such business surroundings.[611]

Entrepreneurs in these environments need to be aware that if business partners exhibit any form of dishonest behavior, they cannot aim at remedy because institutional and structural assurances, such as contracts, norms, regulations, and a supportive legal system, are immaturely developed or absent. This also implies that institution-based trust cannot evolve, which could act as a support mechanism in uncertain situations.[612] The innovators described the absence of this "trust lubricant"[613] as aggravating an already difficult situation and adding complexity to the service development. Prior studies have already recognized the absence of trust in these environments but have not explicitly included the construct in their theorical models.[614]

608 Cf. Cunha et al. (2014), p. 206.
609 Cf. Khanna (2018), p. 24.
610 Rotter (1967), p. 651.
611 Cf. Marquis & Raynard (2015), p. 306.
612 Cf. McKnight & Cummingsm (1998), p. 478.
613 Cf. Khanna & Palepu (1997), p. 11.
614 Cf. Mair & Martí (2009); Webb et al. (2010); Mair et al. (2012); Kistruck et al. (2013).

Like prior research, this study also includes resource scarcity as another key constraint dimension of the emerging market context. The model includes both firm- and user-level resource constraints, as both sub-dimensions have equally important implications for the development and the implementation of new services. In this study, resource scarcity at the firm-level[615] primarily referred to shortages in IT skills and know-how, managerial capabilities and the access to capital and assets, while limitations at the user-level involved shortages of income and a limited technological comprehension (i.e., the capability to exploit IT for certain purposes).[616] The resource constraints identified in this study are also consistent with the findings made in prior studies. Yet, so far, only little attention has been paid to the user- or customer-level capacities of how to effectively use digital technologies and devices.

This study showed that people in these environments often do not have the education and the adequate exposure to IT (such as computers) needed for a quick learning curve.[617] The innovators in this study recognized that this limited digital literacy significantly affected the fate of the service, and, thus, embracing the users' limitations became a critical factor along the service design and the implementation of the service. They were concerned with the question of how to provide effective and reliable service offerings, which users experience as valuable.[618] Hence, despite pervasive ICTs in emerging markets, with significant investments in the mobile infrastructure and the provision of affordable devices,[619] this study showed that anticipated outcomes, such as efficient transportation, do not materialize if societies are incapable of transforming these digital goods and services in desired outcomes.[620] This study points out, that these economies are marked by a huge digital capability divide, hampering large-scale adoption of digitally enabled services.

Furthermore, this model integrates both theoretical context dimensions, institutions and resources in its framework, whereas most prior studies focus on either one or the other.[621] This integrative view of considering both institutional factors and resources, as suggested in this

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615 Young firms typically suffer from various resource constraints. Typical challenges include the liability of newness and smallness and the associated lack of reputation and reliability, which explains why it is difficult for young enterprises to acquire financial and human capital resources (Volkmann et al. (2010), pp. 26-27). However, the complexity and quality of resource constraints found in emerging markets substantially differ from the well-established issues young firms are typically confronted with in developed markets.

616 Cf. Dewan & Riggins (2005), p. 301.

617 Cf. Chliova & Ringov (2017), p. 51.

618 Cf. Berger & Nakata (2013), p. 1199.

619 Cf. Hsieh et al. (2008); Dewan et al. (2010), p. 927.

620 Cf. Srivastava & Shainesh (2015), p. 246.

621 Cf. Webb et al. (2010); Mair et al. (2012); Rivera-Santos et al. (2015).

study, is consistent with more recent academic views, that underline to capture the context-specificities of emerging market economies.[622] For example, Zoogah et al. proposes that the African context influences the effectiveness of organizations through two theoretical building blocks: institutions and resources. Furthermore, it is suggested that the dynamics of institutions and resources involve interactions of national, industry and organizational factors, and, thus, both dimensions need to be considered to better understand the dynamics of African organizations.[623] According to Hoskisson et al., incorporating an institution-based view provides a more contextualized perspective on how resources are combined to achieve a competitive advantage.[624] This study underpins the view, that institutions and factor markets (resources) do not have an impact in isolation from each other. It is argued that the availability of resources forms the basis for development and production activities in a specific country, while institutions facilitate both production and distribution of generated rents through contract-enforcing mechanisms.[625] In accordance with these perspectives, this model integrates both dimensions.

Another key insight from this study is that these various institutional and resource-based constraints emerged over time and could not be anticipated at the outset of the service development process. Furthermore, these complex constraints triggered innovators to perform a variety of creative activities, which can be aggregated to a practice of continuously designing for solutions. Over time, this continuous process of problem-solving led to the emergence of a multidimensional value proposition, creating value for both individual users and the society. This idea formed an understanding for developing and implementing a new service by designing for multidimensional value.

The other two startups, which struggled to implement the service successfully, paid less attention to the institutional shortcomings and focused particularly on how to overcome the resource constraints. They were mostly concerned with the shortages in firm-level resources, especially the access to capital as well as the limitations of the customer income while expecting the government and public officials to establish new regulations and trust-enhancing initiatives. Their focus was on building a profitable business model and pursuing a technology-centric approach, which, on the one hand, led to a focused and rapid service development process, but,

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622 Cf. Zoogah (2008); Zoogah et al. (2015); George et al. (2016), pp. 379-382.
623 Cf. Zoogah et al. (2015), p. 21.
624 Cf. Hoskisson et al. (2013), p. 1317.
625 Cf. Krug & Hendrischke (2012).

on the other, to a misinterpretation of interdependent constraints, such as the users' limited digital capabilities and the levels of trust in the business environment.

6.4 Service Development Practices

Leveraging Digital Platform Capabilities. To deliver a new service that fills the service gap in the transportation sector, the innovators had to innovate to address the various constraints. Doing so involved leveraging digital platform capabilities and integrating the new service into the socio-cultural environment. Leveraging digital platform capabilities implied exploiting the diverse functions of digital platforms in combination with other systems and complementary technologies (e.g., social media, mobile computing and IoT) to address the contextual constraints and make the new service work.[626] Integrating in the socio-cultural environment, on the other hand, described complementary practices to contextualize the service and promote social embedding of the service.[627]

The term digital platforms as used in this study is applied to highlight a platform's distinctive leverage rationales, namely mediating transactions and promoting innovation,[628] in contrast to discussing the term platform as product architecture as typically used in the engineering design literature.[629] In this study, digital platforms are viewed as performing two key functions: on the one hand, they build the venue for innovation by integrating internal and external resources and achieving efficiency gains for all actors involved, on the other, the platforms facilitate transactions, because they serve as the base for organizing exchange relationships and help establishing rules and norms of how these actors can interact with each other. Similar to the practice of leveraging digital platform capabilities, others have discussed the role of leveraging IT capabilities. In the domain of NPD research, the "IT leveraging capability" is prominently established and defines "… the ability to effectively use IT functionalities to support IT-enabled NPD activities."[630] The focus is on exploiting specific IT tools to enhance the work of organizational NPD work units, to sense the environment, enhance learning and manage resources and activities.

In contrast, leveraging digital platform capabilities has a broader meaning, going beyond leveraging the architectural design of new products or services to increase generativity and

626 Cf. Ahuja & Chan (2016), p. 8.
627 Cf. London & Hart (2004), p. 364; Simanis et al. (2008), p. 64.
628 Cf. Thomas et al. (2014), p. 198; Teece (2018).
629 Cf. Gawer & Cusumano (2014), p. 418.
630 Pavlou & El Sawy (2010), p. 447.

efficiency of the platform, towards addressing market constraints (e.g., information asymmetries) and facilitating partner integration. Anand & Monin studied the innovation process of new insurance services and highlighted the role of "technologization" as a sub-process of the service innovation process, which describes the process of "… using technology to address the shortcomings of insurance offerings".[631] Yet, this mechanism essentially uses new or existing technologies, especially social media, to support the marketing of the service offering. More recently, Ahuja stressed the adoption of specific IT innovation capabilities in the context of frugal ecosystems, which he labeled "Leveraging Emergent Information Technology (LEIT) capability"[632]. This capability defines "the ability to effectively use underlying SMACIT systems and technologies to support frugal innovation."[633] In sum, these prior capability concepts put the emphasis on the exploitation of IT capabilities to address various kinds of constraints. This study draws upon these conceptualizations but concentrates on leveraging the potentials of digital platforms in particular. Hence, the concept of leverage, understood as "… a process of generating an impact that is disproportionately larger than the input required", constitutes a central feature of platforms, as Thomas et al. point out.[634] Adopting a broadened understanding of the term digital platform with its underlying functionalities and potentials also resonates with the claim of Khanna & Palepu, who state that innovators or firms entering the emerging market context need to accommodate multiple functions in their business strategy, as for example institutional functions to overcome the institutional gaps.[635]

As Figure 14 depicts, the analysis identified four major activities that were performed by leveraging digital platform capabilities to respond to constraints: integrating partners, filling information gaps, reducing costs, and promoting behavioral changes. Consistent with integrating partners, research suggests that engaging in local partnerships is a vital strategy in constrained environments to secure access to relevant resources and markets. Previous studies thereby emphasized developing unconventional partnerships with NGOs and with local communities to scale the new product or service.[636] Prominent examples include the cases of large multinationals, such as Telenor and Danone, which, through their partnerships with Grameen, a microfinance organization founded in Bangladesh, scaled up telecommunications

631 Anand & Monin (2013), p. 48.
632 Ahuja & Chan (2014), p. 8.
633 ibid.
634 Thomas et al. (2014), p. 206.
635 Cf. Khanna & Palepu (2010), p. 42.
636 Cf. London & Hart (2004), p. 361; Webb et al. (2010); Linna (2013), p. 4.

services and healthy nutrition, respectively, for the deprived segments of the local society.[637] Yet, the focus so far has been on two-sided partnerships among resource-rich MNCs and NGOs. Digital platforms, on the other hand, allowed young resource-poor firms to integrate multiple partners and build value creating constellations that had not been possible before. The result was a collaborative network structure that united various actors and bundled diverse resources in a resource-poor setting.[638] Hence, the digital platform is a vital instrument for increasing resource density, resource integration and value creation.[639]

Furthermore, the emergent networks, that have been engendered through the use of platform technology, stimulated creative business model design. Prior research pointed out that firms operating in emerging markets need to develop business models that create high value at very low cost,[640] and that are able to overcome the challenges and constraints in the emerging market environment.[641] Leveraging digital platforms brought forth new ways of capturing value and saving costs by adequately distributing costs among actors.[642] For instance, despite operating in a capital intense sector, the innovators could keep the capital intensity low because the fixed assets were spread across the partner ecosystem (e.g., the provision of vehicles).[643] At the same time, the platform served as a venue for innovation,[644] because it supported the mixing and matching of resources on the platform and the integration of new resources to rapidly and flexibly adapt to the rapidly changing context conditions.

Furthermore, a key strength of digital platforms is its capability to mediate transactions. For instance, the digital platform was leveraged to fill severe information gaps, to regulate the resource exchange among partners and to stimulate behavioral changes to eliminate opportunistic behavior and to build trust. These tactics were necessary to reduce the transaction costs and to promote market formation processes.[645] It has been pointed out in prior research, that the opportunity for digital multi-sided platforms ordinarily arises when frictions hamper efficient interactions among market participants and, thus, create an opportunity for a platform

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637 Cf. Seelos & Mair (2007), p. 54.
638 Lusch & Nambisan (2015), p. 160.
639 Cf. ibid, p. 166.
640 Cf. London et al. (2010), p. 583; Chliova & Ringov (2017), p. 51.
641 Cf. George et al. (2012), p. 663; Winterhalter et al. (2017).
642 Cf. den Hertog et al. (2010), p. 495.
643 Cf. Prahalad (2012), p. 11.
644 Cf. Lusch & Nambisan (2015), p. 157.
645 A prominent example is eBay, which allows huge numbers of individual sellers and buyers, located anywhere in the world, to find one another with an ease that had previously been unimaginable (Teece (2018), p. 1376).

to resolve these frictions.[646] The digital platform played a facilitating role and ensured that the collaborative value creation process was efficient and effective. More specifically, it allowed the innovators to accommodate institutional functions for their service to work. To do so, they established a governance system, including rules, incentives and penalties, to promote effective transactions.[647] The platform namely enabled codifying acceptable or desired behavior by establishing informal rules and norms to secure an amenable service experience for the customer. Therefore, the digital platform built the base for the service and is a key facilitator for the core practices to be performed. The digital platforms enabled the innovators to build an infrastructure layer for the new service as a support infrastructure in an unorganized sector. Instead of being focused on the implementation of a structured NSD process, these innovators' major service development activities were reflected in building the digital and physical infrastructure to make the service work.

Overall, the digital platforms provided a low-cost, easy-to-access and easy-to-deploy instrument to the young firms, which had been unable to acquire and establish an expensive digital infrastructure and other resources to compete with larger incumbents in the sector. These features made them an ideal fit to the emerging market context.[648] Consequently, the term digital platform, as applied in this study, is used in a broader sense. It is the heart of the new service and viewed in this study as an effective mechanism for addressing both resource constraints (by accumulating and integrating resources) and institutional dysfunctionalities (by establishing rules and norms for effective transactions).[649]

Integrating in Socio-cultural Context. This study reveals, that developing and implementing a new service does not occur in a vacuum, but in relation to people, such as customers, personnel and partners, who eventually will interact with the new service. Hence, leveraging a digital platform and launch the new service was not enough to develop and provide the new service, entrepreneurs also had to engage in deep interaction with the local community, to connect the service with the socio-cultural meaning system and to adjust to people's cognitive capacities to achieve the desired service experience.[650] This study underlines the socio-cultural dimension of technology and its consideration in service development.[651]

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646 Cf. Evans & Schmalensee (2016), p. 36.
647 Cf. Lusch & Nambisan (2015), p. 165; Evans & Schmalensee (2016), p. 37.
648 Cf. Gawer & Cusumano (2014), p. 428; Ahuja & Chan (2016), pp. 3-4.
649 Cf. Helfat & Raubitschek (2018), p. 1392.
650 Cf. Khanna (2018), p. 40.
651 Cf. García & Bartolomé (2010).

Integrating the service in the socio-cultural context aimed at fostering social embeddedness and the legitimacy of the service. This key practice comprised two main activities: demystifying the service innovation, which implies reducing or eliminating complexities and the vagueness attached to the new service[652] and synchronizing the service with established social norms[653] and technological standards.[654] Research argues that initiatives must connect with the institutional context and the needs of local users because value is socially defined and differs from one context to another.[655] Integrating in the socio-cultural context meant creating awareness as well finding the right fit between the needs of the market and the technical specifications of the new service.[656]

Instead of implementing the service in the market, in the sense of making it available for market participants,[657] the innovators in this study had to actively dispel the myths associated with transportation and to improve the value and the perceptions attached to digitally enabled transportation services. This was important to increase the acceptability and the adoption of the service, eventually, from the S-D logic, value is created if the value is in use.[658] This means they sought to integrate the service in the socio-cultural system in a way that people were able to combine it with their daily routines without any problems.

This also included adapting the service to the digital capacities and literacy level of the users. First, due to the lack of income, people often did not have access to computers or could not afford active data plans to use the mobile Internet. Furthermore, people did not have the comprehension of how to navigate an app and to create an account needed for ordering the service. The innovators in this study embraced these constraints and enabled their services also through rudimentary technologies, i.e., integrating software and hardware technology in cell phones that is far behind technological standards in developed economies.[659] This was an indispensable step for promoting the adoption and commercialization of the service and to provide a successful delivery. Due to these, often overlooked, user-level constraints, solutions, primarily based on advanced technological innovation, frequently failed to deliver the desired outcome.[660] An illustrative example for this is the One Laptop Per Child program, which failed

652 Cf. Anand & Monin (2013), p. 44.
653 Cf. Khanna (2018), p. 89.
654 Cf. Anand & Monin (2013), p. 50.
655 Cf. Akaka et al. (2013), p. 9; Ben Letaifa & Reynoso (2015), pp. 687-688.
656 Cf. Heeks (2012), p. 27.
657 Cf. OECD & Eurostat (2018), p. 18.
658 Cf. Vargo & Lusch (2004), p. 7.
659 Cf. Chliova & Ringov (2017), p. 51.
660 Cf. Acumen (2016).

to meet its ambitious objective of substantially improving education in the poorest countries by simply handling low-cost laptop computers to impoverished children.[661] The product received much criticism, such as being an over-simplified solution with a top-down design developed from a Western mindset and not applicable to specific African problems.

Others stressed the need for achieving "social embeddedness". According to London & Hart, social embeddedness refers to "… the ability to create competitive advantage based on a deep understanding of and integration with the local environment"[662]. This involves weaving a web of trusted connections with various actors in the local business ecosystem, including institutions, complementary players and customers. Being able to understand and build on the existing social infrastructure to suit prevailing cultural and market conditions has promoted a process of bottom-up service development.[663] In this vein, Marquis & Raynard conclude that where contract-enforcing mechanisms are weak, relational strategies become pivotal to an organization's ability to secure resources, support and trust from important external audiences.[664]

Research proposes other strategies to connect with the local environment. For instance, prior studies suggest collaborating with NGOs to leverage the NGOs' social embeddedness in the local context[665] or adapting to local languages, such as Swahili, to enhance ties with local stakeholders and to work effectively with local communities.[666] Others suggest "demystification", "commodization" and "retalization" as relevant practices to organically embed the service in the local environment.[667] These practices were found to decrease the complexity and facilitated integration of the service in existing physical retail infrastructures.

Drawing on the socio-technical view, others conclude that the implementation of a digital service innovation in emerging market economies is effective when the unique socio-human, governmental and regulatory as well as the market conditions of the local context have been accounted for so that a fit is achieved between the technologies and the environment they are situated in.[668] An implementation, thus, needs to proactively address the customers and the partners' limitations with the new technologies. Prior NPD research targeting emerging markets

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661 Cf. Warschauer & Ames (2010), pp. 33-34.
662 London & Hart (2004), p. 364.
663 Cf. ibid; Bruton et al. (2013), p. 684.
664 Cf. Marquis & Raynard (2015), p. 308.
665 Cf. Webb et al. (2010), p. 566.
666 Cf. George et al. (2016), p. 382.
667 Cf. Anand & Monin (2013), p. 51.
668 Cf. Berger & Nakata (2013), p. 1199.

suggests implementing activities, such as "leap-frogging the lacking infrastructure", "leveraging the existing infrastructure", "developing a product-related infrastructure" and "using existing products as vehicles for addressing the needs".[669]

This study builds on these prior findings and introduces the practice of integrating the service into the socio-cultural environment. It implies making the service congruent with the meanings and values prevalent in the local context to eventually facilitate the establishment and adoption of the new service. This involved demystifying the service and synchronizing it with the established technological standards and social norms. This was helpful to build trust and gain social approval. Furthermore, this category of practice resonates with the assumption, that value creation of a service systems depends on a service system's adaptiveness or ability to fit in its environment. In accordance with the S-D perspective, this also means that the new service (or resource) can only bring improvement if it is compatible with the local competences and resources of the beneficiaries (users).[670]

The analysis and comparison of all six cases revealed that Intra-City Carpooling and Inter-City Carpooling adopted a technology-centered lens, focusing on leveraging the digital platform capabilities, while being less concerned with the socio-cultural dimension. They poorly addressed user-level constraints and did not take effective measures to build trust. Intra-City Carpooling, when creating its offering, assumed that customers wanted cheaper, efficient and sustainable options to drive around the city, underestimating essential factors, such as the people's access to computers and their capabilities to make use of the service. As a result, local customers did not internalize the service despite its lower price and transport efficiency. Prior studies on the BoP have shown that undervaluing the customers' service preferences, meaning systems and capacities, rooted in local cultural differences, derailed several attempts to market to the BoP, even though products were provided at very low cost or for free.[671] For instance, offering mosquito nets, either through subsidies or for free, have not ensured their consistent usage by poor households.[672] Indeed many did not use them for a variety of complicated socio-cultural and economic reasons. For instance, some refused to hang the nets as they were

669 Cf. Viswanathan & Sridharan (2012), pp. 60-62.
670 Cf. Vargo et al. (2008), pp. 149-150.
671 Cf. Kayser & Budinich (2015), p. 32.
672 Cf. Tarozzi et al. (2014), p. 1938.

associated with causing death to children and infertility in women. Others considered malaria a trivial disease or attribute it to causes other than mosquitos.[673]

Both companies' activities focused on leveraging digital platform capabilities to integrate partners, efficiently aggregate demand and supply and capture value from cost reductions and various income streams (Table 6). However, they neglected to engage with the local users and communities to demystify the service and to synchronize it with existing capabilities to promote adoption and acceptability. Research refers to this behavior as avoidance behavior or escape from acting under the constraints of resource scarcity, which can result in abandoning new opportunities, terminating innovation projects or ignoring exiting markets.[674] Rather than proactively addressing contextual shortcomings and crafting a service that relies on available resources and user competences in the external environment, they meant to overcome weaknesses by adopting a more passive approach, namely by designing around the holes in the local business environment.[675] Yet, this study shows that both leveraging digital platform capabilities and integrating the service in the socio-cultural environment are equally important practices to make a service work.

6.5 Multidimensional Value Creation

Emergence of Trust. These two key service innovation practices have also contributed to the creation of trust, which is important for the service implementation and the subsequent service exchange processes. Early research on trust states that all economic exchanges require a minimum amount of trust.[676] Researchers like Scott et al. argue that "… organizations require more than material resources and technical information if they are to survive and thrive in their social environment"[677], meaning they also require social approval and legitimacy from their audience. In strategic alliances, Sherman concludes that "… the biggest stumbling block to the success of alliances is the lack of trust."[678] Rousseau states: "Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another."[679] Cultivating trust in an environment devoid of confidence

673 Cf. Shah (2011), p. 226.
674 Cf. Baker & Nelson (2005), p. 331.
675 Cf. London & Hart (2004), p. 364.
676 Cf. Akerlof (1970), p. 500.
677 Scott et al. (2000), p. 237.
678 Sherman (1992), p. 78.
679 Rousseau et al. (1998), p. 395.

and certainty regarding the behavior of others, and where formal institutions are absent,[680] was challenging, but indispensable for the startups to engender the functioning of the service and to form a long-lasting relationship with the customer.[681] Similarly, London & Hart postulate that a competitive advantage in emerging markets is less based on the protection of "proprietary technology and intellectual property, but more on the development of trust and social capital".[682] While literature acknowledges the role of social capital, legitimacy and trust in the context of emerging markets, prior studies provide few examples of how firms and entrepreneurs engage in relational strategies, such as trust-building, by leveraging digital technology.

A key insight from this study is that the innovators leveraged the digital platforms to nurture trust. First, they could substantially reduce the inefficiencies associated with agency problems[683] by providing all exchange partners with reliable information (e.g., transaction-related information, such as price and costs) which built the foundation for trust to emerge.[684] Information was gathered on the platform and redistributed across the service ecosystem at any time. This ad hoc provision of reliable information not only enhanced the decision-making and promoted rational choices, but also formed the base for relational trust.[685] This contrasts with the previous situation where transparent and reliable information was largely absent and customers had to choose among the very few unfavorable options.

In addition, the innovators in this study leveraged the digital platforms to establish social feedback systems as trust-encouraging measures which provided information on the competence of the other actor to perform the economic exchange (the ride) appropriately.[686] Research in the developed market context points out that trust is a particular challenge for online markets, where trades are typically anonymous and geographically dispersed. To increase trustworthiness, online markets, such as eBay, Amazon and RentACoder, often employ reputation-based feedback systems, enabling transaction partners to publicly post information about past transactions and experiences with the counterpart. For these markets, feedback systems, in combination with their large databases of transaction histories, are a core asset,

680 Cf. Khanna (2018), p. 33.
681 Cf. Lee et al. (2015), p. 298.
682 Cf. London & Hart (2004), p. 365.
683 Cf. Zoogah (2008), p. 246.
684 Cf. Morgan & Hunt (1994), p. 26.
685 Relational trust derives from repeated interactions over time between two parties (Rousseau et al. (1998), p. 399).
686 Cf. Barber (1983).

crucial for the user loyalty, trust and the market efficiency.[687] The feedback systems were an important mechanism for facilitating transactions and eventually for supporting the market formation process.

Firms in Western economies can build on an institutional support system that enables institution-based trust to arise through guarantees, enforceable rights and reliable legal systems. The innovators in this study lack this support system, and, therefore, had to compensate for the absent business support infrastructure. For instance, the innovators defined a set of rules and norms and established monitoring mechanisms (e.g., drawing sensor data from the driver's smartphone) for verifying the appropriateness of the driver's behavior. In developed economies, legal contracts are often used as mechanisms for controlling behavior in low-trust situations.[688] While formal contracts were useless in the African business environment, the innovators in this study, utilized so-called "implicit contracts"[689]. This means that the service exchange relationship cannot be enforced by third parties, such as courts. Instead, only the parties of the contract, or those affected by its violation (as for example the customers) can determine whether an actor complied with the agreement or not and only they can enforce the contract. The established monitoring mechanisms, in combination with the social feedback system, provided all exchange participants with the necessary transparency about whether or not the exchange partners complied with the pre-defined terms. As a result, if one player did not comply with the agreement by being dishonest or unreliable, the interaction could be terminated. In this study, the innovators removed dishonest service partners from the platform, who then lost all their benefits.[690]

In service marketing, Berry & Parasuraman find that customer-company relationships need to be based on trust.[691] Indeed, they contend that, "… effective services marketing depends on the management of trust because the customer typically must buy a service before experiencing it"[692]. For all startups, technology was the key input factor to develop a new service and to address the trust void. Yet, equally important were the practices to integrate the service in the socio-cultural environment, such as demystifying the service through communication and interaction with the actors of the ecosystem and being in sync with existing local practices,

687 Cf. Bolton et al. (2013), p. 265.
688 Cf. Rousseau et al. (1998), p. 399.
689 Harvey (2002), p. 299.
690 Cf. ibid.
691 Cf. Berry & Parasuraman (1991), p. 144.
692 ibid, p. 107.

social norms and technological standards. One vital strategy to build trust in the service involved simplifying the user interface for first-time Internet users by enhancing its usability.[693] The term usability can be defined as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use"[694]. It is related with product attributes, such as being "understandable, learnable, easy to use, and attractive"[695].

Researchers acknowledge that the design of the user interface has a significant positive effect on the success of mobile services.[696] Previous studies on website usability also empirically proved that trust of the users increases when the user experienced the website as usable (or 'user-friendly'), resulting in a positive relationship between usability and trust.[697] However, most research on mobile user interface designs is based on paradigms and patterns originating from the West, but these designs do not fully fit the mobile context in emerging markets and thus cannot be replicated. Little is known how to achieve usability for emerging market users, characterized by limited digital literacy and comprehension. This study showed that for first-time Internet users, mobile phones and smartphones still represent complex artifacts. The complexity is reflected in the multiple functionalities along with different responses, feedback messages and navigational cues within the app menu and settings. The innovators worked with simplified interface schemes, when designing the service. Enhancing simplicity, for instance, implied reducing navigational and screen complexity, finding locally attractive color codes and minimizing the use of symbols, so that users felt comfortable using it.[698]

Continuously nurturing trust is essential for the success of a service. As the data in this study demonstrates, the two firms that were not able to successfully grow their services recognized the severe trust deficit but did not devise any course of action to engage in trust formation as a complementary resource for building the new service. They focused on the rapid service rollout to exploit the identified business opportunity and expected the rest to function. The other four cases, in contrast, developed a different self-image, understanding their role as aggregators of trust, creators of transparency and market-builders by pursuing a bundle of activities and integrating trust-enhancing mechanisms to cultivate trust within the emergent service

693 Cf. Lee et al. (2015), p. 295.
694 International Organization of Standardization (ISO), ISO 9241-11:2018.
695 International Organization of Standardization (ISO), ISO/IEC 9126-1:2001.
696 Yi (2010), p. 51.
697 Cf. Flavián et al. (2006), p. 1; Punchoojit & Hongwarittorrn (2017), p. 2.
698 Cf. Lee et al. (2015), p. 296.

ecosystem. The four entrepreneurial firms worked assiduously to cultivate precisely such trust in the emergent network of actors.[699] They realized that to create a successful service innovation in these challenging business environments, they needed to go the extra mile to compensate for the dysfunctional, institutional environment in which they operated by establishing a trust infrastructure.[700]

Multidimensional Value Proposition. The innovators in this study recognized that one-dimensional value propositions were not enough to create a substantial change in the service experience. They developed a systemic response to the problems they were addressing and to ensure the functioning of the service. The cases showed how innovators engaged in various activities to provide an unprecedented value proposition for the end-customers, which is reflected in a substantially improved service experience, standing out from the existing ones in the sector. The new service offering was at its core characterized by affordability, ease-of-use, accessibility (via different channels) and trustworthiness. These components of the value proposition are largely consistent with prior research findings on characteristics of value propositions designed for the emerging market context. Typically, these studies stress the '4As' (awareness, accessibility, affordability and availability) as the core elements for successful offerings targeting emerging markets and the BoP.[701]

For instance, Srivasta et al. identify affordability and accessibility as key value propositions and examine how interactional resources are leveraged to improve healthcare services in India across these two dimensions.[702] Agarwal argues that cost-effectiveness and ease-of-use are the core characteristics of constrained-based innovation and should be incorporated in the design of new products and services.[703] The innovators also stressed that affordability is most important for creating value in emerging markets.[704] To make innovations affordable, the startups sought to substantially reduce costs along the value chain, keep capital intensity low and leverage locally available low-cost technologies and infrastructures (e.g., USSD).[705]

In this study, the innovator teams also worked towards creating value for all actors involved in the value creation process. Business partners benefitted from transparency, access to more

699 Cf. Lusch & Nambisan (2015), p. 160.
700 Cf. Khanna & Palepu (1997), p. 17.
701 Cf. Anderson & Billou (2007), p. 14; Varadarajan (2011), p. 118; Prahalad (2012), p. 6.
702 Cf. Srivastava & Shainesh (2015), p. 262.
703 Cf. Agarwal (2016), p. 9.
704 Cf. Chandra & Neelankavil (2008), p. 1022; Anand & Monin (2013), p. 51.
705 Cf. Linna (2013), p. 4.

clients and additional revenue streams. Thus, the value proposition in this study is expanded to not only provide benefits for the individual customer, but also for the community of actors in the service ecosystem. As a result, the study showed that developing a new service in and for users in emerging markets not only involves addressing the users' specific needs and desires, but also includes addressing more systemic socio-economic problems and thereby creates value for as many actors and groups as possible.[706] Similarly, Winterhalter et al. identify in their study on the medical device and laboratory equipment industry that the business models of the examined firms contain multiple value propositions targeting various customer groups. More specifically, the frugal value propositions create benefits for the industry, clinic doctors and patients.[707]

The innovators in this study have proven a capacity to tackle multiple value creation contexts, not just for the intended users, but also for the whole ecosystem of actors.[708] With the inclusion of various stakeholders, research proposes the adoption of an "ecosystem perspective" to better capture the complex, holistic, networked structure of service systems.[709] As a result of these multiple initiatives, a multidimensional value proposition emerged that not only enabled a new service experience for the customer but also created multidimensional value for the community of actors, such as institutional, social and economic value. For example, institutional and economic value was created as they bridged the gap towards financing for their drivers so they could access vehicle-financing and become self-employed. Furthermore, the innovators also aimed to provide gender-equal employment opportunities, legitimating women[710] to become partners or employees in the new service system.

Multidimensional value creation also resonates with recent calls for considering "total wealth maximization"[711] in networks of profit- and non-profit sectors that collaborate to create multidimensional value at the BoP.[712] The concept of total wealth maximization comprises both economic and social wealth creation. Research often conceptualizes social entrepreneurs as agents that address complex and persistent social problems and who can make diverse contributions to society. They are described as exploiting opportunities and market failures by filling gaps to underserved clients to introduce reforms and innovations to the broader social

706 Cf. Mair & Schoen (2007); Yunus et al. (2010).
707 Cf. Winterhalter et al. (2017), pp. 9-10.
708 Cf. Ben Letaifa & Reynoso (2015), p. 685.
709 Cf. Wieland et al. (2012), pp. 12-13; Ben Letaifa (2014).
710 Cf. Mair et al. (2012), p. 819.
711 Zahra et al. (2009), p. 519.
712 Cf. Ben Letaifa (2014); Ben Letaifa & Reynoso (2015), p. 690.

system.[713] In this context, filling holes in the fabric of social systems is viewed as a vital entrepreneurial function. Other researchers stress the role of grassroots entrepreneurs in developing affordable products and services, but also strengthening local communities,[714] filling institutional voids[715] and promoting more inclusive patterns of development.[716] Even though the entrepreneurs in the underlying study did not consider themselves as social entrepreneurs, they were also focused on creating social wealth in addition to commercial profit.

Yet, this study showed how a new group of tech startups which approach the business context with empathy and a human-centered approach to innovation are likely to incorporate socio-economic goals within their innovation strategy instead of pursuing a pure profit-oriented approach. These innovators leveraged both digital and socio-human capabilities to drive market creation as a mechanism for economic and social development. Hence, the concept of a total wealth maximization is not only bound to social entrepreneurs. Lusch & Nambisan describe such actors as effectual as they decide what they can do in their constrained and unpredictable world and how to actively shape the service ecosystem by providing new value propositions, building complex partner networks and redefining the rules of the game. This process may also create new markets, and, thus, the innovators in this study can also considered to be "market-driving" instead of "market-driven".[717] By actively addressing inefficient market structures, they converted an unorganized into an organized market.[718] Hence, as demonstrated in this study, service innovation is not just about serving an existing market more efficiently, but rather about creating a new market.

6.6 Innovation Pattern: Designing for Multidimensional Value

This study also examined whether the interplay between the experienced constraints, innovation activities and outcomes could be aggregated to an overarching response to the various constraints that entrepreneurs and corporates face in many, if not all, emerging markets. All four innovators developed a fine-grained understanding of the market. Over time, they sensed[719] a variety of issues that affected the fate of the service at a different degree of intensity and temporality. As a result, they recognized at an early phase that they needed to innovate

713 Cf. Zahra et al. (2009), p. 520.
714 Cf. García & Bartolomé (2010), p. 303; Khavul & Bruton (2013), p. 293.
715 Cf. Mair & Martí (2009); Mair et al. (2012).
716 Cf. George et al. (2012); Papaioannou (2014); Angeli & Jaiswal (2016).
717 Cf. Lusch & Nambisan (2015), p. 171.
718 Cf. Prahalad (2012), p. 6.
719 Cf. Day (1994), p. 43.

differently, meaning that pursuing a formalized NSD process with clear stages appeared inadequate to respond to the complex and unknown issues they were facing. A major insight from this study is that to successfully develop and implement a digitally enabled service in emerging markets was reflected in the meta-practice of designing for multidimensional value. This involved embracing and proactively addressing a multitude of problems over time by continuously designing and redesigning the solution rather than being laser-focused on developing and implementing a precisely defined service concept.

Service development as observed in this study can be viewed as an iterative process of adaptive trial and error movements, in which innovators try out strategies that contribute to the transformation of situations towards achieving positive outcomes.[720] Quickly realized small successes and failures help to avoid risking jeopardizing the entire effort. Sarasvathy refers to this procedure as "effectuation"[721] and argues that this means to recognize and understand the, often messy, service innovation processes in the making. She suggests that effectual strategies are useful when the environment is marked by high uncertainty, as it stimulates a process of constructing rather than decision-making.[722] Effectuation begins with given means and seeks to create new outcomes using non-predictive strategies, whereby the innovation process becomes a matter of design instead of decision. Effectuation can be also described as a specific design logic for making things in a human-made universe.[723]

The, here discussed, four startups continuously engaged in innovative efforts and actions to respond to these constraints of varied types[724] and ultimately developed adequate solutions for emergent issues. Aggregating these individual solution components enabled the functioning of the service and simultaneously resulted in the creation of a multidimensional value proposition. Drawing on Simon, designing describes "… devising courses of actions to changing existing situations into preferred ones"[725]. In this study, the four innovator teams engaged in an explorative design approach, where they sought to find out how to create valuable service experiences that people find enjoyable and that are congruent to their needs and preferences. This contrasts with a linear approach, as reflected in the service engineering literature in which

720 Cf. Sarasvathy (2003), p. 203.
721 Effectuation is viewed as the inverse of causal models. Causations seeks to achieve pre-defined effects by selecting different means. In contrast, effectuation begins with the means (Sarasvathy (2009), p. 16).
722 Cf. ibid.
723 Sarasvathy (2001), p. 245.
724 Cf. Linna (2013), p. 5.
725 Simon (1969), p. 55.

the service is typically defined at the outset of the innovation process and then built in a systematic way.[726]

Even though the innovators of this study were inspired by service exemplars from the developed country context, they learned that they could not adopt a Western service blueprint to the emerging market context in which they operated in. They realized that they were confronted with a complex set of issues not captured in the Western models, because they were absent in institutionally mature environments. Instead of following a linear innovation process, they moved forward in circular motions, pursuing a strategy in which problems and solutions co-evolved.[727] This explorative approach to problem-solving, which involved constructing an understanding about what is designed with the actors in the local context, is, according to Kimbell, a special case of service design, which can be labeled "designing for service".[728] Extending this conceptualization and underlining the relevance of a multidimensional value proposition of developing new services in emerging markets, this study refers to this meta-practice as designing for multidimensional value.

Similar to design thinking, the innovators adopted a human-centered approach of design, in which the user played a major role. In the design discipline, the most common approach of user-centricity is to see the user as an individual, bringing needs, desires and knowledge to be listened to and integrated in the design stage and the end results. The dominant view in user-centered development is that the user participates actively in the designing of a service and that he/she will be an active component, with his/her own capabilities.[729] In the emerging market context, as reported by the respondents, the users articulated issues, but were less involved in the design activities and co-creation efforts, as they lacked the imaginative power to develop new ideas or were too reticent to communicate them. The innovators in this study were driven by an unrelenting effort to decode the deep-seated desires and needs of the local users to surface latent issues. To do so, they continuously observed the context to gain an in-depth understanding of the local problems. This required a deep immersion in the "lived context"[730], observing and discovering the highly nuanced, tacit, human needs, emotions, hidden motives and practices, combined with considerations of life circumstances and existing marketplace

[726] Cf. Kimbell (2011a), p. 45.
[727] Cf. Cross (2006), p. 80.
[728] Cf. Kimbell (2011a), p. 45.
[729] Cf. Meroni & Sangiorgi (2011), p. 4.
[730] Cf. Viswanathan & Sridharan (2012), p. 68; Srivastava & Shainesh (2015), p. 259.

dynamics. Existing literature stresses that empathy is one of the most important features of design thinking[731] and particularly important in the context of emerging markets.

Prior research on emerging markets surfaced the concept of user-centricity,[732] arguing that the closer the innovation efforts are to the local end users, the more likely they are to respond to the user needs and to deliver the desired functionality.[733] Yet, the studies often concentrate on the product design stage in the NPD process, whereas in this study, the innovators incessantly engaged in design and continuously observed their environment, especially how humans interact with each other and how they navigate their smartphones and the apps. Anytime they noticed red flags, they sought to improve the situations and address the issue with the current means at hand. As a result of this dynamic design process, the anatomy of the value proposition was permanently at change, as new value components (e.g., service offerings or functions) were continuously added or removed.

This continuous design with the aim to solve problems underscores the exploratory nature of service development in emerging markets in which the desired end-state cannot be known at the starting point, because the problem cannot be defined precisely.[734] Hence, the phrase "designing for service", rather than designing services, considers that what is designed is not the final result, but rather a platform for action.[735] Innovators were unable to fully imagine, plan or define the complete architecture and design of the service, since new kinds of constraints surfaced during the innovation. This means that whenever they encountered an issue/constraint, they reframed the problem as an opportunity and devised actions to solve this problem. Designing for service was a recurrent meta-activity: Once the service system and the core service were implemented, the innovators continued to design for derivative service concepts or new features to respond to emergent issues. As a result, the service remained incomplete on purpose.[736]

In contrast to this proactive approach, the other two startups that could not considerably advance their service, avoided to address various constraints. Existing research refers to this behavioral pattern with the theory of choosing the "path of least resistance"[737], which states that when

731 Cf. Brown (2009), p. 49.
732 Cf. Meroni & Sangiorgi (2011), p. 4.
733 Cf. von Hippel (1998), p. 629; London & Hart (2004), p. 364.
734 Cf. Hatchuel (2001), pp. 263-268.
735 Cf. Meroni & Sangiorgi (2011).
736 Cf. Garud et al. (2008), p. 352.
737 Cf. Ward (1994), p. 35.

people approach the task of developing a new solution for a particular domain, they tend to retrieve existing knowledge and select information from this domain as a starting point for the new creation.[738] Consequently, the new solutions can be expected to resemble to a large extent to the old exemplar. However, scholars suggest that constraints stimulate the mind for creative thinking.[739] Studies on scarcity innovations point out that scarcity conditions affect how problems are defined and solved. The defining part includes needs, wants, demands and constraints; the solving part entails ways of addressing them.[740] Hence, through the ability to actively address constraints, firms could seize advantages where competitors rather saw only obstacles.

Intra-City and Inter-City Carpooling aimed at replicating a service solution stemming from the developed country context, thereby abandoning new opportunities that emerged from the varieties of challenges attached to the core problem of insufficient service supply in the local transportation sector. They were rather avoiding to the new challenges. In the case of Inter-City Carpooling, this script-based and top-down thinking of service innovation for the emerging market context, eventually terminated the innovation project, as the customers exhibited resistance of applying the service. It is thus suggested that peoples' construction of transportation, which is embedded in their normal patterns of action, should be identified, and then considered in the design and implementation of transportation services. This view is consistent with a study on the introduction of telemedicine systems in the jungles of northeastern Peru, a region with well-established traditional healing practices (e.g., herbal and spiritual–magical healing). The idea of delivering scientific medicine through IT encountered much resistance in the implementation phase, because this practice was conflicting with the local society's meaning systems and values.[741] But for a new service, which represents a new social practice, to endure and exist, it must be continually reproduced to become an internalized routine.

The other four firms revised their initial approach of implementing a modified Western service template and took the service idea one step further. To do so, they designed a new service from scratch, by acquiring new knowledge about the context, hence, resulting in much more creative and valuable outcomes. To do so, they went through a process of breaking down their initial

738 Cf. Ward (2004), p. 183; Baker & Nelson (2005), p. 353.
739 Cf. Hewitt-Dundas (2006); Gibbert et al. (2007), p. 16; Keupp & Gassmann (2013).
740 Cf. Srinivas & Sutz (2008), p. 135.
741 Cf. Miscione (2007), p. 403.

dominant vision, which constrained their imagination and creativity. Instead, they acknowledged that they were pursuing a complex project, which needs to respond to the various constraints, and, thus, the initial service concept required extensive modification to result in a satisfactory outcome. This process of meandering and improvising also brought forth more creative outcomes.

In sum, addressing constraints and creating a new service offering can be translated in the concept of designing for multidimensional value, which describes the capacity to holistically transform an unfavorable, inefficient situation into an improved one. Given this vital role of designing, this study does not conceptualize design as a distinct stage in an innovation process, as proposed in the traditional NSD literature, but views it as a meta-practice. As understood in this study, "design is change"[742] and "designing for multidimensional value" can be regarded as a systemic response to bring about change in the realities of the users and other actors in the ecosystem.[743]

[742] Neumeier (2009), p. 32.
[743] Cf. Kimbell (2011a), p. 41.

7 DISCUSSION

This chapter discusses the three major contributions of this study. Subchapter 7.1 elucidates the key implications of trust voids for service innovation and how trust is conceptualized in the extant research stream so far. Then, the distinct role of digital platforms in the emerging market context is discussed, enriching the theoretical discourse of digital platforms (7.2). In Subchapter 7.3 the importance of design and the value of designing for the emerging markets is discussed. This chapter also provides relevant practical implications (7.4). It concludes with the limitations of this investigation and provides fruitful avenues for future research (7.5).

7.1 Emerging Markets as Low-trust Environments

First, this model refines the understanding of the context of emerging markets, by depicting the low level of trust as another key context feature. This characteristic proved to affect the innovation practices and the value proposition in a substantial way.

Research, in general, suggests to pay attention to institutional conditions when examining business activities[744] because institutions affect the efficiency and effectivity of exchange processes between exchange partners.[745] In emerging markets institutional voids prevail,[746] which have been defined above as the absence of market-supporting institutions, property rights, contract-enforcing mechanisms and infrastructure.[747] While the negative impact of dysfunctional institutions on innovation activities is well documented, much of the literature has paid less attention to the socio-psychological characteristics of the institutional environment.[748] The emphasis, in other words, is typically on examining factors that are quantifiable, such as a country portfolio analysis, a political risk assessment, corruption ratings and governance indicators, as opposed to the “soft infrastructures” that support innovation and market activity.[749] However, a key insight from this inquiry is that the innovators experienced serious issues of trust in the local business environment, with specific trust problems found in

744 Cf. North (1990).
745 Cf. Wan & Hoskisson (2003), p. 28.
746 Cf. Mair & Martí (2009); Khanna & Palepu (2010); George et al. (2012); Hoskisson et al. (2013); Zoogah et al. (2015); George et al. (2016)..
747 Cf. Khanna & Palepu (2010), p. 14.
748 Cf. Hitt et al. (2006), p. 847.
749 Cf. Khanna & Palepu (1997), p. 38.

the transportation sector. These trust issues, hence, deteriorated the conditions for implementing a new service in the already challenging business environment in sub-Saharan Africa.

In developed economies, well-functioning institutions, especially the enforcement of laws and intact legal systems, facilitate the formation of trust, as they promote risk-taking behavior. Institutions, metaphorically referred to as the "rules of the game", matter for the emergence of trust because these humanly devised constraints structure human interaction.[750] They consist of both informal rules (sanctions, taboos, customs, traditions and codes of conduct) and formal rules (constitutions, laws and property rights) as North points out.[751] The underlying assumption, according to Ingram & Silverman, is that "… actors pursue their interests within these institutional constraints"[752]. Without these trust-enhancing institutional foundations, market-based transactions are substantially compromised. As shown in this study, the underdeveloped formal institutions created a business climate of high uncertainty in exchange relationships so that people cannot feel assured about the other party's intentions and future behavior.[753] More precisely, this thesis showed that institution-based trust, i.e., the security one feels about a situation because of guarantees, safety nets or other structures,[754] is widely absent or immature in these economies. Yet, if these institutions are absent or weakly developed, the question arises of how trust can be built?

This requires to better understand the phenomenon of trust. Trust at its core can be defined as "… a willingness to rely on an exchange partner in whom one has confidence"[755]. It generates a level of confidence, that persons who are party to an exchange will behave as expected.[756] Fukuyama argues that trust is just as important as physical capital in facilitating the creation of large-scale business organizations and has huge economic value necessary to drive economic growth and development.[757] Early scholarly research has already postulated that without trust, "no market could function"[758]. Research emphasizes that trust is not a behavior but a psychological condition.[759] More specifically, it is viewed as "… a generalized expectancy held

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750 Cf. North (1990), p. 3.
751 Cf. North (1991), p. 97.
752 Ingram & Silverman (2002), p. 1.
753 Cf. McKnight & Cummingsm (1998), p. 478.
754 Cf. Shapiro (1987), p. 645.
755 Moorman et al. (1992), p. 315.
756 Cf. Luhmann (1988).
757 Cf. Fukuyama (1995), p. 10.
758 Arrow (1973), p. 27.
759 Cf. Rousseau et al. (1998), p. 395.

by an individual that the word of another can be relied on."[760] It is a state of mind that enables the possessor to be willing to make himself/herself vulnerable to another, that is, to rely on another despite the likelihood that the other might act in a harmful way to the trustor. In other words, trust is an expectation, pertaining to circumstances in which agents take risky actions in uncertain environments. Hence, to say "A trusts B" implies that A has built the expectation that B will not exploit a vulnerability A has created for himself/herself by taking the action.[761] Trust, therefore, significantly affects who we choose to deal with and how closely we monitor the other person in the course of our dealings. Trust and trustworthiness are, thus, considered important elements in economic exchanges. Economic or political system requires trust as input condition, otherwise it creates an unfavorable business climate for entrepreneurial engagement.

The vital role of trust becomes especially obvious if the S-D logic is applied to the investigation of NSD, as exemplified in this thesis. According to the S-D logic, value is co-created through the recurrent interaction between customers and service providers. Hence, the viability of new services depends on repeated interactions and transactions between customers and service providers over time. Trust is an important condition for recurrent service exchange to occur. Thus, it is important for the survival of any service that an exchange with the customer evolves from an arm's-length transaction to a trust-based relationship.[762] Research suggests, that "… repeated cycles of exchange, risk taking, and successful fulfillment of expectations strengthen the willingness of trusting parties to rely upon each other and expand the resources brought into the exchange"[763].

The idea of trust and its role for economic development is far from being new. Early economic research recognized that trust enhances economic efficiency because it can reduce the transaction costs of enforcing honest behavior.[764] Similarly, other authors state: "One of the most salient factors in the effectiveness of complex social systems is the willingness of one or more individuals in a social unit to trust others. The efficiency, adjustment, and even survival of any social group depends upon the presence or absence of such trust."[765] Some scholars argue that much of the economic backwardness in the world can be explained by the lack of mutual confidence. For instance, Furlong states that the absence of trust is particularly prevalent in

760 Rotter (1967), 651.
761 Cf. Harvey (2002), p. 291.
762 Cf. Rousseau et al. (1998), p. 399.
763 ibid.
764 Cf. Mill (1891), pp. 68-69.
765 Rotter (1967), p. 651.

many developing and transition economics in which economic transactions are viewed as exploitative[766] rather than mutually beneficial.[767] It can be concluded that trust is an essential component of human relationships and fundamental to the emergence of healthy societies and economies.[768] Trust, therefore, plays a particularly vital role in economic relationships that are staged within environments where well-developed institutional structures are lacking. This thesis, therefore, suggests incorporating trust in the theorization of innovation processes in the context of institutionally deficient environments.[769]

Although a growing body of research on emerging markets highlights the importance of a firm's social capital, trust, personal ties in facilitating cooperation and the regulation of social behavior,[770] only little attention has been paid to the implications of trust voids on the development and the implementation of digital services in the emerging market context. In this study, the innovators noticed a prevalence of low levels of trust in the local ecosystem. Customers found other economic actors to be not trustworthy and suspected others to exploit their trust. They could not build confident expectations that other actors will expose the promised behavior, and, thus, their propensity to take on a certain risk through cooperation with new actors was low. The general expectation was that the action of the trustee might be detrimental to the trustor, and as a consequence, there was a tendency to refrain from cooperating with the other.[771]

Some scholars argue that the absence of trust discourages business activities and innovations. One key assumption is that individuals in lower-trust societies need to spend more resources to protect themselves from being exploited in economic transactions (e.g., through bribes, security personnel), turning the business case negative.[772] In addition, it is assumed that if entrepreneurs must devote more time to monitoring possible malfeasances by partners, employees and suppliers, they have less time to devote to innovations in new products or processes. A prior study on corruption and institution-based trust underpins this view, concluding that

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766 One study states that Africa's slave trade not only adversely affected the economic development, but also sparked a culture of mistrust to evolve within Africa, which persists today. Drawing on contemporary individual-level survey data and historical data on slave shipments by ethnic groups, the researchers find that individuals whose ancestors were heavily raided during the slave trade are less trusting today (Nunn & Wantchekon (2011), p. 3221).

767 Cf. Furlong (1996), p. 2.

768 Cf. Hill & O'Hara (2006), p. 1723.

769 Cf. Rousseau et al. (1998), p. 397.

770 Cf. Ansari et al. (2012); Bradley et al. (2012), p. 695; Linna (2013), p. 10; Marquis & Raynard (2015), p. 317; George et al. (2016), p. 384.

771 Cf. Gambetta (1988), p. 217; Harvey (2002), p. 293.

772 Cf. Knack (2001), p. 2.

entrepreneurship and innovation rather do not occur in institutional voids, instead, it is claimed that government actions need first to provide a supportive institutional infrastructure for productive outcomes.[773] Yet, in this thesis, the innovators were innovative and creative in addressing these trust voids to shape the context in which they were operating in.

More specifically, the entrepreneurs intentionally engaged in certain innovation activities, to address the trust void as an opportunity and to differentiate the service from the local competitors. They acknowledged that they had the adequate IT tools and skills to build trust. Hence, they performed a set of trust-building activities, such as filling the information gaps, regulating the behavior of their drivers to provide an amenable service experience, proving price transparency and simplifying the user interface.[774] Research suggests other trust-building strategies. For instance, Webb et al. examined the entrepreneurship process of multinational enterprises in BoP markets and propose that firms can gain trust and legitimacy through relational ties with NGOs because the non-profit status of NGOs engenders trust within BoP markets.[775] The innovators in this study were initially skeptical of the quality of the local partners' performance and needed to overcome the trust voids to promote the emergence of business relationships. Especially at the outset of the service implementation, partners typically displayed dishonest behavior due to a short-term orientation. To support trust formation in these network relationships, the innovators created strong value propositions paired with a digital control system, which effectively stimulated a change in behavior and incentivized the partners to act trustworthy.[776]

This study concisely showed that for services to work in environments without the intermediation of well-established and reliable institutions, new forms of trust need to emerge between individuals and parties that do not know each other. The use of digital platforms and more specifically social feedback systems, such as those used to denote a vendor's trading history, has shown to contribute to trust formation among customers and drivers. New approaches of trust, such as conceptualized in the network of what is called the 'blockchain' of all previous transactions, with permissions and authenticity checked by those within the community, provide new tools for contribution to the construction of trust. The digital

773 Cf. Anokhin & Schulze (2009), p. 475.
774 See a detailed description thereof in the Subchapters 6.3 and 6.4.
775 Cf. Webb et al. (2010), p. 567.
776 Cf. Harvey (2002), p. 302.

technology and platform represent a context rich for inquiry for innovation scholars in trust deficient systems.

Overall, the data in this study provides insights in how entrepreneurs experienced and responded to the severe trust deficit. Instead of designing around the trust problems, these innovators actively addressed the trust issue. Startups leveraged digital technology, especially mobile phones, mobile networks, digital platforms, social media and the IoT as key tools to build a trust-enhancing infrastructure that aimed at eliminating information asymmetries and forms of opportunistic behavior. But technology was not enough – they also engaged in deep conversations to demystify the service, built a physical infrastructure for the customers and synchronized the service with existing norms and standards.

While there is a broad consensus that trust is essential in a variety of ways, the implications of trust and trust-building activities are barely studied in the context of emerging markets. Factoring in the concept of trust in emerging market context dimensions also resonates with the claim "… to consider more fine-grained notions of institutional context"[777], as Hoskisson et al. state. This study suggests that the low levels of trust, together with institutional dysfunctionalities and resource constraints, substantially influence the innovation activities and the outcome. Consistent with Zoogah et al., this study also lends support to the claim for more complicated innovation frames in constrained environments to capture relevant business constraints.[778] Focusing only on one dimension will not go far in the context of emerging markets because it will not surface the activities necessary to build a robust service in these volatile environments.

7.2 Digital Platforms as Institutional and Generative Instruments

This study also highlights the central role of digital platforms for the development and the implementation of new services in the emerging market context. Research states that digital platforms are core elements of service innovation in the digital age, as they ensure the efficiency and the effectiveness of the service.[779] Indeed, service researchers increasingly stress the need for lifting up the level of analysis in service research by including platforms in service research to expand the traditionally narrowly examined term service innovation.[780] In this vein, Lusch

[777] Hoskisson et al. (2013), p. 1316.
[778] Cf. Zoogah et al. (2015).
[779] Cf. Lusch & Nambisan (2015); Evans & Schmalensee (2016).
[780] Cf. Barile et al. (2016).

& Nambisan propose a tripartite framework of service innovation consisting of three components: ecosystems, platforms and value co-creation.[781] This study sheds light on the valuable role digital platforms play in constrained environments. The platforms were found to perform two vital functions: (1) fillings institutional voids by formalizing value creation procedures[782] and (2) providing the generative space for new resource combinations.

Filling Institutional Voids. In view of the various institutional constraints and the low level of trust, the innovators in this study had to think beyond a structured NSD process and consider the broader institutional and societal context of service innovation.[783] The entrepreneurs recognized that if they want to build a scalable service, they cannot merely focus on the bits and pieces of the service development process but must also build an infrastructure that fills the institutional holes to enable the service to work properly. Prior research has argued that due to the lack of reliable institutions emerging markets require innovators to be institutional as well as business entrepreneurs. This means that in addition to finding ways of how to run a business they also need to plug institutional holes or in the words of Khanna, they need to "create the conditions to create"[784]. Literature provides many examples, where large resource-rich MNCs entering emerging markets have invested in expensive efforts to build an infrastructure for their traditional business model to function. These prior efforts typically involved the transfer of institutional systems from Western economies as a compensatory mechanism instead of engaging in local experimentation.[785] In contrast, other researchers have already started to examine how networks can generate their own "proto institutions" to substitute for and/or complement the broader society's institutional system in both developed and developing economies.[786] This study extends this thought by shifting attention to digital platforms as means to facilitate the production of new micro institutions, understood as new practices, technologies and rules, and making them available for the actors and partners involved in value creation. In this study, the generated proto institutions combined with the system of rewards and sanctions for enforcing these institutions had the potential to become widely institutionalized in the social system.[787]

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781 Cf. Lusch & Nambisan (2015), p. 158.
782 The innovators, in this study, leveraged industry platforms (Gawer & Cusumano (2014)), especially the Android mobile platform, from where they could access a variety of resources, such as maps, driving analytics, APIs and more, to build a service that addresses various issues at the same time.
783 Cf. Barrett et al. (2015), p. 147.
784 Khanna (2018), p. 20.
785 Cf. Mair et al. (2012), p. 821.
786 Cf. Lawrence et al. (2002); Webb et al. (2010), p. 566.
787 Cf. Lawrence et al. (2002), pp. 282-283.

The innovators in this study, however, leveraged digital platforms to accommodate institutional functions. More specifically, the digital platforms were deployed to perform three important institutional functions: facilitating transactions among actors, filling information gaps and stimulating behavioral changes. Digital platforms in conjunction with other technologies, thereby, were helpful to substantially reduce transaction costs arising from institutional voids and the severe trust deficit. For instance, by sharing relevant information and documenting all exchange processes in digital protocols, the platforms facilitated and accelerated partner integration, which was foundational for accessing relevant resources. A long-standing set of research on how to overcome institutional voids has underlined the importance of developing business groups to minimize opportunistic behavior and transaction costs.[788] It is argued that that large business groups can represent responses to market imperfections in institutionally deficient economies by imitating and substituting missing institutions.[789] Furthermore, Khanna et al. discussed how the German supermarket chain METRO changed the local context conditions to run their business in China, where food safety problems were endemic by fostering networks between rural farmers and local buyers to improve the quality and traceability of its meats and fish.[790]

This study showed that the platforms enabled the formation of complex networks. They provided unprecedented transparency based on the abundance of information they gathered, precisely clarifying "who contributed what"[791], and thereby allowing equal distribution of the value that is collaboratively created. This was crucial to enable complex business partnerships to emerge in an environment which is plagued by great levels of distrust due to opportunistic behavior and absent contract-enforcing mechanisms. Indeed, due to the high transaction costs of monitoring the exchange partners, complex collaborative efforts are mostly disincentivized or abandoned. This study provided the key insight that small tech firms have found a way to build complex networks by leveraging digital platform capabilities. They utilized the platforms to redefine rules and norms, establish an internal governance model and provided partners with real-time access to all relevant information. These new possibilities were important incentives to attract partners to enter the network.

788 Cf. Khanna & Palepu (2000); Khanna & Rivkin (2001), p. 45.
789 Cf. Khanna et al. (2005); Khanna & Rivkin (2006), p. 335.
790 Cf. Khanna et al. (2005), pp. 16-17.
791 Lusch & Nambisan (2015), p. 166.

Prior research highlights that entrepreneurship in informal economies often requires new organizational forms or alternative governance models that ensure access to resources. So far, these studies did not consider the role of digital platforms in establishing adequate governance structures. On the other hand, existing literature on digital platforms focuses on large industry platforms, such as Microsoft, Apple, Google, Intel, Cisco and Qualcomm, in developed markets, analyzing how these platform-leaders and their thousands of partners create value in the platform-based ecosystem.[792] This research stream centers on more narrow questions, such as how platform leaders should regulate and control the digital interface specifications of the various components (resources) to facilitate fast, economical and effective resource integration, or how to provide information security and legally valid knowledge management protocols.[793] This study, on the contrary, surfaced how digital platforms can be used to establish effective governance and monitoring mechanisms in an institutionally dysfunctional context, thereby addressing the larger institutional and societal context of the service.

Another key function of the digital platforms involves stimulating behavioral changes.[794] By redefining rules and norms in terms of how actors interact, the digital platform, thus, made certain kinds of behavior more difficult and others more probable. Doing so primarily involved introducing and enforcing a set of rules,[795] complemented by a sanction and reward system, which was helpful to change the behavior of the drivers. The digital platforms, thereby, were used to establish monitoring systems, specifically for surveilling the behavior of their drivers. The goal was to communicate to riders that every bad action was now monitored and entailed consequences. Yet, to stimulate behavioral changes, it was also important to provide strong incentives for the drivers, for example, by bridging access to financing[796] and providing access to vehicle ownership and other assets of desire. Providing first-time access to status symbols, such as cars, indicated personal financial development in the social community. These new prospects worked as effective incentive[797] to stimulate a change in behavior. The digital

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792 Cf. Gawer & Cusumano (2014), p. 417.
793 Cf. Lusch & Nambisan (2015), p. 167.
794 Note: The establishment and the enforcement of rules for the new service would not be feasible, however, without the interplay of various IT tools. Especially, the combination of sensor technology, mobile networks, -devices, -operating systems, algorithms and digital platforms were essential to codify the acceptable (or desired) behaviors of the drivers. This system helped to guide and manage the interactions between the actors (riders and customers) in a real-life context to substantially change the service experience.
795 Cf. North (1990).
796 The gathered information on the platform was, e.g., shared with partner banks that, in turn, could identify low-risk candidates and collect revenue-based rates for the vehicle financing.
797 Leveraging the positive power of 'negative' mechanisms, such as envy and social pressure was important to achieve the desired behavioral change and ultimately deliver an improved service experience to the end-customer.

platforms, hence, had a market-driving effect. By redefining behavioral rules and filling market-relevant information voids, the digital platforms supported the firms to internalize roles normally served by market intermediaries or institutions in developed markets (such as authentication services, official registries and sanctions for unfaithful behavior).[798] Hence, leveraging the platforms was essential for organizing and formalizing an informal sector.[799] This impact of digital platforms on informal sectors in the emerging market context requires extensive future research.

More recently, economics literature researching digital platforms in the developed market context concludes that digital platforms can resolve market frictions as they can mediate transactions.[800] Yet, this study underlines that establishing multi-sided digital platforms in emerging markets, marked by limited digital literacy, first requires enabling the actors on the different sides of the platform to gain the competence of knowing how to use them effectively. Low digital literacy and numeracy are key constraints for implementing digitally enabled solutions. Due to the limited digital skills, local partners and users are less able to intuitively use advanced services or platforms with complex screen instructions and procedures. This is the point where integrational practices become relevant to embed the service and the platform in the local context.

Taken together, the broader message for innovation scholars targeting emerging markets is to acknowledge the significance of platforms and ecosystems to shape the evolution of markets[801] and industries in environments that are characterized by perverse market conditions.[802] This key insight also responds to the recent call for more research on the role of organizations to improve the situation of local societies where states fail to deliver economic and social goods. This study went beyond standard practices of CSR by exploring how the firms created conditions to deliver the new service, and, in addition, engaged in addressing SDGs as natural components of their business endeavors (e.g., fighting against gender discrimination, educating their employees and partners, bridging infrastructural gaps).[803]

Generativity of Digital Platforms. The second important implication is that digital platforms are important mechanisms to respond to resource scarcity. In general, they are viewed as

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798 Cf. Khanna et al. (2005).
799 Cf. Prahalad (2012), p. 6.
800 Cf. Evans & Schmalensee (2016), p. 36.
801 Cf. Lusch & Nambisan (2015), p. 158.
802 Cf. Zoogah et al. (2015), p. 13.
803 Cf. George et al. (2016), p. 386.

providing a low-cost, easy-to-access and easy-to-deploy tool to young firms, which are unable to build up an expensive digital infrastructure and acquire other resources to compete with larger corporate firms in the local environment.[804] This makes the platform a natural fit for tech entrepreneurs operating in a resource-constrained environment.[805] In particular, the emergence of mobile platforms is a key enabler for innovation in resource-scarce environments and provides a wealth of opportunities for entrepreneurs.[806] These mobile platforms provided access to a broad base of resources, such as global skills, knowledge and technological assets, that were combined in a way to match the local problem context. Access to these abundant IT-resources saved substantial costs and software development time. All firms could get access to a basic digital infrastructure and IT assets without making great financial investments, they only needed the absorptive capacity to use different types of knowledge available on the platform.

In addition, through resource liquification, which refers to the decoupling of information from its related physical device,[807] the innovators could accumulate vital informational resources (about their drivers, vehicle positions, driving times, routes, etc.) to significantly grow their resource base. The gained business intelligence and could use these information resources to increase overall business and service efficiency. To benefit from resource liquification, the innovators in this study equipped the vehicles or motorcycles with digital capabilities by leveraging smartphone sensors to record the drivers' acceleration, braking, speed, routes and real-time revenues. These technologies together generated big data, while the platform had the necessary analytics to derive the insights.

By 'entangling' the vehicles with software-based digital capabilities, the service innovation designers could expand the realm of possibilities for new value creation.[808] This means, a vehicle that previously had a pure physical materiality now also had a digital materiality (through the software) because it could record the representations of movement in a digital format. The digital materiality of the product then provided new possibilities for creating new service experiences and using the vehicles for other purposes than originally planned. This resource liquification unleashes generativity, as Tilson et al. would say.[809] "Generativity refers to the (re)programmability of the digital artefacts"[810], meaning that digital artefacts are

804 Cf. Ahuja & Chan (2016), p. 3.
805 Cf. ibid.
806 Cf. Zahra & Nambisan (2011), p. 8.
807 Cf. Lusch & Nambisan (2015), p. 160.
808 Cf. Yoo (2010), p. 216.
809 Cf. Tilson et al. (2010), p. 749.
810 Yoo et al. (2010), p. 726.

inherently dynamic and malleable. This "procrastinated binding"[811] of form and function, as Zittrain refers to it, means that new capabilities and functions can be added after a product or service has already been designed and produced. As a result, designers could reprogram the service at any time.[812] This insight, thus, extends the debate on the flexibility of solutions targeting the emerging market or the BoP context, and suggests thinking about a platform paradigm instead of about single services and products to increase the overall efficiency for the users. Viswanathan & Sridharan suggest that products need to be contextually malleable and fulfill various purposes.[813] However, prior innovation research has been conducted from a G-D perspective, emphasizing the importance of embedding flexibility in physical objects, thereby neglecting the high degree of flexibility enabled through digital technology.

Overall, a digital (service) innovation allows a greater flexibility because digital innovations are intentionally "incomplete"[814], i.e., the scope, features and value of the offerings would continue to evolve even after being implemented in the market.[815] Hence, digital innovation is perpetually in the making,[816] thereby creating unprecedented dynamics and opportunities for the NSD process. This new degree of flexibility, enabled though IT and digital platforms in emerging markets, therefore, calls for a more complicated capability approach which leads to the third contribution of this study.

7.3 Designing for Multidimensional Value as Relevant Innovation Capability for Emerging Markets

Research emphasizes that due to the various constraints in emerging market economies, innovators need to develop specific innovation capabilities.[817] Capabilities are generally defined as the capacity to undertake activities and, thus, they are latent until called into use.[818]

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811 Zittrain (2006), p. 1980.
812 Cf. Calabretta & Kleinsmann (2017), p. 297.
813 Cf. Viswanathan & Sridharan (2012), p. 62. Note: One of the most important traits of innovation processes and outcomes with digital technology is the emergence of a platform as the central focus of the innovation (Yoo et al. (2012), p. 1400). Digital platforms are often described as a foundation upon which other firms can develop complementary products, technologies or services (Gawer (2009), p. 2). The concept of a platform is not a new one (Ciborra (1996); Kim & Kogut (1996)). However, the pervasive penetration of digital technology with its flexible, open affordances has heightened the role of a platform and made it the central focus of many firms' innovation activities (Yoo et al. (2012), p. 1400). Apple's 'app' ecosystem is the paradigmatic example of this platform type (Teece (2018), p. 1376).
814 Cf. Garud et al. (2008).
815 Cf. Nambisan (2018), p. 1030.
816 Cf. Garud et al. (2008), p. 356; Zittrain (2008), p. 110.
817 Cf. Hamel & Getz (2004); Sharma & Iyer (2012), p. 599.
818 Cf. Teece et al. (1997); Winter (2003), p. 991; Teece (2007); Helfat & Raubitschek (2018), p. 1393.

This study traced the activities and practices of innovators in African emerging markets and surfaced a capability that enabled the innovators to develop and implement digital services successfully. Designing for multidimensional value can be viewed as an explorative approach to service development, where the innovators constructed an understanding about what needed to be designed for their end users. Exploring the constraints then triggered both technology-based and social practices to solve the problem.

Existing research suggests other innovation capabilities in the context of emerging markets. It often denotes frugal innovation capability as vital competence to successfully develop affordable goods and services for the emerging market context. It is the ability of innovators to take costs out of the entire innovation process and make the most out of few resources. Thereby, it applies principles and methodologies from the NPD domain. Similarly, Sharma and Iyer emphasize the role of frugal engineering as key innovation capability.[819] Other researchers, like Sivaprakasam & Srinivasan, view "cost optimization"[820] as the key innovation capability, which can be understood as optimizing the entire 'cost chain' from the source to the customer experience. Based on these frugal practices several pioneering MNCs, such as GE, Unilever, Nokia and also entrepreneurs, were able to produce good-enough products and services. As prior innovation research is largely conducted from a G-D logic perspective and no distinction is made between products and services, the identified practices and capabilities were also found applicable to the development of new services.

In contrast, this study adopted the S-D logic perspective for investigating the development and implementation of digital service innovation in emerging markets and unearthed a distinct innovation capability for developing digital services. Following the S-D logic, this study focused and traced the innovators' activities and practices and analyzed the utilization of digital artifacts to respond to constraints. Analyzing the interplay between the various constraints, practices and value created, this study found that service development resembled an emergent, unplanned and often ad-hoc problem-solving activity to a particular constraint. Innovating in the African environment involved relentless experimentation with the local context parameters, understanding the various contextual and user constraints and identifying effective solutions with a lasting impact.[821] This thesis, thereby, contributes to the claim to develop new frameworks for explaining the potential impact of digital technology on how people innovate

819 Cf. Sharma & Iyer (2012), p. 599.
820 Sivaprakasam & Srinivasan (2015), p. 698.
821 Cf. Khanna (2018), p. 60.

with services.[822] Hence, it expands the theoretical foundation of frameworks which are based on the examination of new services developed in mature market economies.

Prior research on the BoP acknowledged that design plays a vital role in the context of low-income markets. It is argued that design processes need to be consistent with local conditions and user-centric to develop successful solutions for the BoP.[823] In this vein, Viswanathan & Sridharan highlight the complexity of designing solutions in these environments by pointing out that products for BoP markets are innovative if they are designed to be multifunctional and contextually malleable to account for unexpected usage purposes,[824] as local users were found to use the products for multiple purposes other than originally intended for.[825] They further propose that a BoP product design must account for the physical and social environment as well as for the user abilities and constraints in BoP markets.[826] Yet, in these prior studies, design is seen a sub-process or a distinct stage of the NPD process. Furthermore, these prior conceptualization on the practice of design did not explicitly incorporate emergent digital artifacts such as digital platforms in the theorization. As revealed in this study, the innovators exhibited a comprehensive design capability, in which the boundaries between service development and implementation blurred.[827]

Designing for multidimensional value as viewed in this thesis represents a specific problem-solving capability. This view is consistent with early work in design research. For instance, Buchanan[828] describes design as the capability of dealing with what Rittel & Webber call "wicked problems"[829], for which there is no single solution and in which stakeholders play a role in defining the nature of the problems. Departing from this constructivist stance, Kimbell introduces a special kind of service design labeled "designing for service"[830]. This approach can be understood as an exploratory problem-solving approach, in which the desired end-state of a solution cannot be defined a priori but is rather socially constructed and evolves over time.[831] This contrasts with the understanding of design in the 20th century, where the key task

822 Cf. Lusch & Nambisan (2015), p. 156.
823 Cf. Donaldson (2006); Kandachar & Halme (2007), p. 5.
824 Cf. Viswanathan & Sridharan (2012), p. 62.
825 Cf. Prahalad (2010), p. 333.
826 Cf. Viswanathan & Sridharan (2012), p. 64.
827 Cf. Garud & Karnøe (2003), p. 295.
828 Cf. Buchanan (1992).
829 Rittel & Webber (1973), p. 160.
830 Kimbell (2011a).
831 Cf. Hatchuel (2001), pp. 266-267.

involved conceptualizing, developing and producing simple objects, where all characteristics could be pre-determined.

Designing for services is a thoroughly social and context-driven process,[832] where the starting point of exploration is the human being and his/her needs and latent desires. This rather constructionist view can be contrasted with the positivistic view of design, which conceptualizes design as problem solving, where complex problems can be decomposed into smaller units before being solved and where the desired state of affairs is already known from the beginning.[833] Prior studies on NPDs in BoP markets reveal that a major flaw in the design processes was that the product designers and the managers could not personally relate to the real-life context in the markets and explore the user capabilities in the short time they had. Thus, they often tended to apply their expertise, tools and blueprints anchored in Western economies, leading to product designs that did not meet the local users' requirements.[834] The innovators in this study, in contrast, took extended periods of time and approached the real-life context with sensitivity and empathy, pursuing an exploratory, iterative process in which problems and solutions co-evolved.[835] Hence, as reflected in this study, designing is regarded as shaped by a situated understanding of the issues at hand, instead of assuming a context invariance and engineering a service according to Western templates. Thus, the capability of creative problem solving becomes important.

Designing for multidimensional value also focuses on total wealth maximization.[836] Drawing on prior conceptualizations, the term "designing for" underlines that designing for multidimensional value means that all effort is directed towards achieving something greater and making a change,[837] i.e., changing people's situations and providing them with better opportunities so that they can proceed with their lives in a more effective and efficient way. Hence, design in these innovation projects is not equivalent with service design or the design of services; it rather focuses on how the practice of designing can be applied to solve systemic problems and striving for total wealth creation, and, thus, these service innovations can also be considered as social innovations.[838] The design orientation of the innovators in the present study was grounded in the core principle of improvement or betterment and in creating better and

832 Cf. Bucciarelli (1994), p. 83; Donaldson (2006), p. 152.
833 Cf. Simon (1969).
834 Cf. Viswanathan & Sridharan (2012), p. 54.
835 Cf. Cross (2006), p. 80.
836 Cf. Zahra et al. (2009), p. 519.
837 Cf. Meroni & Sangiorgi (2011).
838 Cf. ibid, p. 138.

more efficient options for local users and other partners.[839] Often, this task is associated with social entrepreneurs.[840] According to Zahra et al., social entrepreneurs make significant and diverse contributions to their communities and societies, adopting business models to offer creative solutions to complex and persistent social problems.[841] Hence, design, as understood in this study, encompasses exploring solutions, that local users can integrate with their practices and resources.

This study also sheds lights on the temporality of design. Designing for multidimensional value rather than designing services draws on the notion of Manzini, assuming that what is designed is not an end-result, but rather a platform for further action.[842] This idea also points to the impossibility of being able to fully imagine, plan or define any complete design for a service because new kinds of challenges and opportunities may arise within a service context. Hence, designing for multidimensional value always remains an incomplete task, as already mentioned above.[843] The unpredictability of the local context compelled the innovators to drop the idea of control and to acquire a capability that supports navigating through the various uncertainties they were facing along the service development process. Hence, the predictive logic is replaced by a means-oriented approach, which allows the solutions to emerge in the course of action[844] and through leveraging existing resources.[845] This study also stressed that the S-D logic should be a key point of departure. It provides another perspective to the claim formulated by Prahalad & Hammond almost two decades ago of how to better serve society in these environments and do good while still making profit.[846]

Design is gaining increasing importance as a meta-practice as reflected in this study. For instance, Calabretta & Kleinsman argue that the role of design in innovation is not only evolving but also growing from being a tactical tool for improving the product performance towards a strategic capability and mindset at the heart of business (value creation throughout the entire life cycle).[847] Businesses in developed markets are increasingly using design and design

839 Cf. Karpen et al. (2017), p. 388.
840 Cf. Rivera-Santos et al. (2015); Chliova & Ringov (2017).
841 Cf. Zahra et al. (2009), p. 520.
842 Cf. Manzini (2011), p. 3.
843 Cf. Garud et al. (2008).
844 See Subchapter 6.6.
845 Cf. Sarasvathy (2009).
846 Cf. Prahalad & Hammond (2002).
847 Cf. Calabretta et al. (2016); Calabretta & Kleinsmann (2017), p. 299.

thinking as relevant tools for innovations.[848] Also, design practices are becoming progressively more essential, resulting in the need to integrate design with other business functions.[849]

Existing research on the service innovation originates from highly industrialized settings that do not experience this problem intensity, as exhibited in the emerging market context. Therefore, it is silent on how to deal with multiple challenges and what role design might play. One interesting thought in this vein, that has been recently suggested by Nambisan, is to view digital innovation as a "dynamic problem solution design pairing"[850]. He further claims, "replacing predefined problem solution spaces with an innovation space of fluid boundaries (one that reflects the flexibility of resource re-combinations afforded by digital technologies)."[851] This view implies that with the application of digital technology, the degree of flexibility substantially increases, and the space of possibilities expands with the generativity of the underlying digital platform. In contrast the degree of flexibility of pure physical objects is limited, as only minimal adaptations can be made once the product is introduced into the market. Yet, designing for flexible and inclusive solutions is a key imperative for innovation targeting emerging markets.

7.4 Practical Implications

This study also provides significant practical implications. For years, scholars and practitioners from around the world have waited for the "Africa rising"[852] narrative to turn from vision into reality. Yet, relative to other contexts, such as Asia and Latin America, the African context represents extremes.[853] The level of uncertainty, cultural complexity and institutional instability seems to be higher than that of other world regions. In the last years, a variety of businesses and investors have abandoned their projects and departed from the continent, with leaders exhausted from the various issues and constraints they encountered in the local business context, such as widespread corruption, unreliable infrastructure and lack of talent. Today, the African continent is often presented as the next frontier for businesses and as a hotbed of technological experimentations and innovations. Indeed, a growing number of entrepreneurial firms are

848 Cf. Gardien & Gilsing (2013); Gruber et al. (2015); Hernández et al. (2018).
849 Cf. Barrett et al. (2015), p. 149; Calabretta et al. (2016); Calabretta & Kleinsmann (2017), p. 298.
850 Cf. Nambisan (2017), p. 226.
851 Cf. ibid, p. 228.
852 Cf. The Economist (2011).
853 Cf. Dia (1996), pp. 53-54; Michalopoulos & Papaioannou (2015), p. 32.

hacking institutional gaps and find ways to create value by providing access to new goods and services despite the long-standing challenges.

This inquiry investigated successful innovation practices and capabilities in the context of digitally enabled service innovation in the transportation sector developed in and for emerging market economies in sub-Saharan African. While the study surfaced the various contextual constraints that may discourage digital innovation projects, it also tracked the paths that some innovators have taken to successfully build a new service. The innovators in this study leveraged digital platform capabilities and integrated the service into the socio-cultural environment in a way that it made sense for the local users. The platforms, in this study, combined with other technologies, have enabled savings in fixed costs, efficiency gains and flexibility in the new service offering.

The idea of exploiting business opportunities by simply imitating digital service templates that originate from the developed market context – environments that provide an intact and supportive institutional system – is not an inadequate assumption for the African emerging market context. In view of the complex set of constraints, the key problem is to design a service tailored to the needs and capacities of local users. The innovators in this study acknowledged that the various constraints that emerge in the process of recognizing and exploiting an identified opportunity cannot be anticipated at the outset of the service innovation process. A change of mindset was needed to shift from the idea of merely focusing on the core problem towards developing a systemic solution with a compensatory institutional infrastructure to create the conditions for the new service to work.

This insight leads to the first practical implication of this study, which implies that a mere technology-centered approach will not suffice in these environments and will not work well in delivering the promised value proposition. Instead, innovators need to find ways to ensure that the digitally enabled solution is congruent with the capacities and needs of local users. As a result, developing and implementing the new service in the context of sub-Saharan Africa required a lot of ‘non-technological’ on-the-ground activities and knowledge. This included exploring the field, observing human interactions, interviewing users and potential partners (both formal and informal), training staff and platform partners, building a physical infrastructure with support agents to explain and support the service functioning, being in sync with local practices and incorporating the rudimentary technology with a state-of-the-art platform technology, stimulating behavioral changes and patiently cultivating trust. All these integration practices have taken time to prosper because using digital services represents a new

social practice of how to access and use transportation services, associated with new routines that needed yet to be learned. These activities take time to bring merits, thus, innovation teams and investors should be prepared to enter these innovation environments with patience, persistence and an extended time horizons, as short-term results and expectations might not materialize immediately.

Navigating this complex environment and creating value despite the various constraints, however, requires a specific capability, which is referred to in this study as designing for multidimensional value. This insight represents the second practical implication. Designing for multidimensional value, instead of designing services or service design, highlights that NSD is an emergent ad-hoc problem-solving activity to emergent issues. The innovators in this study took extended periods of time and approached the real-life context with sensitivity and empathy, pursuing an exploratory, iterative process in which problems and solutions co-evolved. This means, that the practice of designing is also no longer exclusively bound to professional designers, but to a team, and especially entrepreneurs, who become empathic and technologically enthusiastic change agents in this environment.

As highlighted in this study, digital service innovations have the capability to substantially transform established social and economic practices in institutionally deficient environments. Consequently, designing these services and service systems merits particular attention and goes beyond the idea of the focused design of the platform architecture or the app design, instead it involves the design of how humans will interact and engage in transactions in an emerging formalized market environment. Therefore, this study underlines that digital services targeting the emerging market context should be assembled with a deep understanding of the local business environment, including institutional, psychological and socio-cultural factors of the specific sector. It is recommended that attention should be paid to digital literacy levels and capacities of local users. Furthermore, service development should begin with a deep immersion in the context and ethnographic studies to understand the complex dynamics and interdependencies in the local social system. Ignoring the unique socio-human, psychological and market conditions, existing in the respective setting, can cause a new service to be rejected by the users.

Third, this study also highlights the role of entrepreneurs and thereby provides insights regarding the “Who of innovation” in emerging markets. In this study, entrepreneurs with international experience (CTOs and CEOs) were the ones better positioned and most motivated for success, than innovation teams from large MNCs. The young tech firms in this study

impressively demonstrated how to plug holes in the institutional system by adopting a platform-based strategy for service development. Increasingly, large IT companies such as Google,[854] Samsung, Facebook and Microsoft are using sub-Saharan African emerging economies as labs in which they develop and test scalable service innovations by leveraging digital technologies that serve local societies. To do so, they enter the local startup-ecosystems to work together with the continent's most creative minds. Traditional MNCs from the manufacturing sector might rethink their strategy and role in the emerging market context and reflect on the idea of co-creating value with local tech firms. The CEO of Motorcycle Taxi in this enquiry explained:

> *A traditional car manufacturer is probably how could we sell more cars to individual end users. But individual end users are still so far away from being able to afford their own cars. But transportation in Africa is such a pain. And it is when people cannot afford cars, how do you address the pain points in transportation in this equivalent and this is just an interesting example of a different approach. So, the question is how to spread more mobility in a developing world.*

One example could be to engage in value co-creation through partnerships or corporate venture capital or a combination thereof to accelerate the leverage of the newly developed solution. In developed markets it is a prominent strategy to engage with startups to enhance corporate innovation, because startups have the agility, that large corporations are missing, whereas the corporations have a resource base, startups can only dream of. Hence, there is large potential for both sides in the emerging market context to co-create value.

Finally, the study also stresses important implications for policy makers. A variety of bold policy reforms are necessary to encourage change and to support innovation in young emerging economy markets, such as those in sub-Saharan Africa. For example, in the context of transportation, large investments into the road network and public transit systems are necessary. At the same time, institutional reforms and robust legal systems are vital to improve the local business conditions for entrepreneurial endeavors. Furthermore, as IT becomes increasingly pervasive, governments in emerging markets are making significant investments in ICT infrastructures to realize the transformational power of ICTs. But the overall growth of ICT resources (e.g., through mobile networks and mobile devices) in a nation does not necessarily result in socio-economic development. This study showed that users still lack the ability to use new digital devices effectively to realize desired outcomes. Tackling this digital capability

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[854] See Appendix 16.

divide through increased education in computer skills is necessary to achieve socio-economic goals. Eastern Africa, with Kenya, Eritrea and Rwanda, is an example of a changing narrative in sub-Saharan Africa with growing domestic markets, higher incomes and progressive policy changes attracting capital flows from developed markets as well as creating a business environment to incentivize entrepreneurial behavior.

7.5 Limitations and Future Research

Like any academic endeavor, this study also has some inherent limitations. The selected cases were relatively new and in the early stages of market diffusion. The long-term success of these new service innovations and the socio-economic impact are not yet known. Whether they are scalable to reach a wider customer segment as for example in rural areas or enter neighboring economies remains to be seen. Therefore, their real impact needs to be ascertained and analyzed over a long-term period of at least five to seven years. Also, this study focused on young tech firms, that were all new entrants in the transportation sector in urban locations in a small set of countries in sub-Saharan Africa, hence, there are inherent limits to the generalizability of this study's findings to other types of firms, industries or countries. However, the comparison of this study's finding proposes that these findings are partially generalizable. Further, case studies would certainly underpin better grounding of the findings.

Furthermore, the study also included retrospective data, particularly regarding the respondents' experienced constraints and the strategies and activities performed to address them. A disadvantage of retrospective data is the risk that the interview partners' interpretations of past events may be biased.[855] To limit data subjectivity, data was collected from different respondents per case. Furthermore, interviewees also commented on contemporary constraints and the activities they performed to create value.

In addition, the context of this study raises questions about the model's generalizability. The study was conducted in the urban context of sub-Saharan Africa, which is mostly associated with a modern context. Culturally, urban contexts are characterized by relative openness and individualistic tendencies. Furthermore, these metropolitan centers have features that are relatively similar to the Western context. In contrast, the traditional context is represented by rural areas and characterized by features such as chieftaincy and councils of elders, an agrarian

[855] Cf. Huber & Power (1985), p. 172..

form of living, ethnic group identities, and collectivistic tendencies.[856] Additional research could extend these insights to the traditional and rural context and investigate the factors that influence the development and implementation of digital service innovation.

This study also opens other fruitful avenues for future research. One path forward is to create a better understanding of digitally enabled service innovation in constrained environments from the user perspective. More precisely, a shift from NSD to the adoption and acceptance of digital services at the user-level is useful, as it can provide relevant insights on the diffusion and large-scale adoption of the service. In this vein, the technology acceptance model (TAM) appears to be an adequate model to evaluate the user acceptance of new technologies by analyzing the user's behavioral intention to use new technological solutions based on perceived usefulness and ease-of-use.[857]

Additional research could investigate the differences in recognition and evaluation of contextual constraints and why different actors ascribe different value- and usage possibilities to existing resources in resource-scarce environments. Cognition psychology could provide relevant insights, as entrepreneurs in this study deconstructed pre-conceived ideas of how things should be done and put existing approaches into question. Prior research describes cognitive fixation as a phenomenon in which objects can just be used for the purposes originally intended for. The innovators in this study overcame this cognitive fixation and were able to find creative resource combinations that made sense for the local user groups. As a result, the question arises of how cognitive fixation has been overcome and how it affected the interpretation of constraints and challenges to translate them into opportunities. Similarly, interesting are the questions of how the innovators of this study prioritized the multiple challenges they were seeking to address and how they shifted their attention among emergent issues. At this point the application of the attention-based view could be of interest.[858]

Another path forward is to better understand the various functions of digital platforms. Past conceptualizations of digital platforms in literature are relatively narrowly designed, often limited to conceptualizations of technology or software platforms,[859] while innovation literature either focuses on the role of innovation platforms or digital multi-sided platforms.[860] Departing

856 Cf. Collier & Gunning (1999); Michalopoulos & Papaioannou (2015).
857 Cf. Davis (1989).
858 Cf. Ocasio (1997).
859 Cf. Gawer & Cusumano (2014).
860 Cf. Helfat & Raubitschek (2018).

from an S-D logic perspective, this study illuminated the broader role platforms can play in the emerging market context, namely as an instrument compensating for the various institutional shortcomings.[861] The platforms helped to create an infrastructure and governance that enabled transactions among diverse actors (both formal and informal) and formalized procedures at the micro-level. The role of platforms as market creating mechanisms in institutionally volatile environments requires much more research. Importantly, platform-based firms can gain substantial power because they can gather and store more information and eventually have more knowledge on behavioral patterns than institutional authorities in emerging markets can have. Thus, it will be important to observe the effects of platforms which succeed in scaling their solution in resource-scarce and institutionally deficient environments, how they can shape the institutional environment and how governmental institutions will react to these new power dynamics. Furthermore, this study outlined how digital platforms can be leveraged, together with integrational practices, to nurture trust. Trust is a relevant condition and a relevant resource for recurrent transactions and effective market exchange processes. Thus, it is equally important to observe how the platforms can create ecosystems of trust in low-trust environments, including tracing trust formation processes, that eventually facilitate market creation.[862]

[861] Cf. Lusch & Nambisan (2015).
[862] Cf. Evans & Schmalensee (2016).

8 CONCLUSION

As digital technology rapidly penetrates emerging markets, it is crucial to understand how firms can innovate with these technologies to create transformative new services. Prior research has pointed out that, innovating in emerging markets is a complex and challenging endeavor for both corporate managers and entrepreneurs due to severe resource scarcity and institutional voids, prevalent in these settings.

The data in this study presents various facets of the contextual complexity found in emerging markets. At the same time, the study also reveals effective mechanisms and activities, the innovators applied to successfully implement a digitally enabled service. The author interviewed six tech startups in depth, that developed and operated digitally enabled service innovation in the emerging markets of sub-Saharan Africa. Yet, only four of them were able to implement their service successfully. The main goal of this study was to trace the key practices innovators have performed during service development and implementation to respond to the severe constraints prevalent in the emerging market context. Comparing across these six cases has brought forth a model of a specific innovation capability, that allowed them to proactively respond to multiple issues and to design a service that creates multidimensional value. The study thereby contributed to our understanding of digital service innovation in the emerging market context in at least three significant ways, as will be discussed in the following.

This thesis concludes that digital technologies provide tremendous potential for the emerging market environment as they offer a universal platform for innovation. Local entrepreneurs have now access to digital technologies and platforms that allow them to develop innovative solutions to societal problems in a cost-effective way. Yet, they need to consider how these digitally enabled solutions can be implemented effectively. This implies that the digital solutions need to be congruent with the context in which they are applied to achieve the intended value. Low digital literacy, the lack of trust and weak regulatory systems are key constraints in the emerging market context and ignoring such constraints in the service development and implementation process can lead to failure of service innovation.

The complexity of constraints and the unclear nature of problems require a design-centered approach to service development. The innovators adopted an explorative approach to service development and developed an ad-hoc emergent innovation capability, that is denoted designing for multidimensional value. This capability does not only consider the technological aspects but also the socio-cultural context for successful service development and

implementation. This capability enabled the innovators to deal with the wicked problems they were confronted with and to build service innovations that can be absorbed from the local users. The practice of design can be expected to be paramount in situations where innovators are confronted with complex, unclear and interconnected problems and where the question arises how to better serve the local users and society. Combining these insights, this study suggests that service innovation in constrained environments occurs at the intersection of continuous design, trust building and digital platforms. If these findings and the model survive further empirical testing, they will shift the understanding of how to innovate with digital technology in resource-constrained environments and provides fruitful avenues for future research.

Beyond that, this study has shown that sub-Saharan Africa provides a fertile ground for innovation research. This is mainly due to the ability to ‘leap-frog’ redundant and inferior eras of technological advancement and to establish completely new systems. But without the commitment to addressing digitally enabled innovation in emerging economies, knowledge will be bound to the Western context. Hence, directing the academic lens to dark corners to shed some light on the factors that facilitate and that thwart the path of technologically enabled solution will enrich science on digital innovation. Similarly, without efforts of both the entrepreneurs and corporate firms to address severe problems persisting in developing regions, from a human centered perspective, large populations in developing economies will not benefit from the digital era. Likewise, the pre-existent bias in innovation research and practice could increase in the future if researchers, policy-makers and corporate decision-makers do not shift their attention to and engage with these regions to unleash hidden potentials. In sum, if this study can serve as a ‘lighthouse’ for more research and can draw the attention of entrepreneurs and corporate leaders to the question of how to better serve these economies considering the context-specific conditions, then the purpose of this thesis will have been well-served.

APPENDIX

Appendix 1: FTSE Country Classification Frontier Markets

Frontier Markets		
Argentina	Jordan	Oman
Bahrain	Kazakhstan	Palestine
Bangladesh	Kenya	Romania
Botswana	Latvia	Serbia
Bulgaria	Lithuania	Slovakia
Côte d'Ivoire	Macedonia	Slovenia
Croatia	Malta	Sri Lanka
Cyprus	Mauritius	Tunisia
Estonia	Morocco	Vietnam
Ghana	Nigeria	

Economies of sub-Saharan Africa

Source: FTSE Country Classification March 2019.

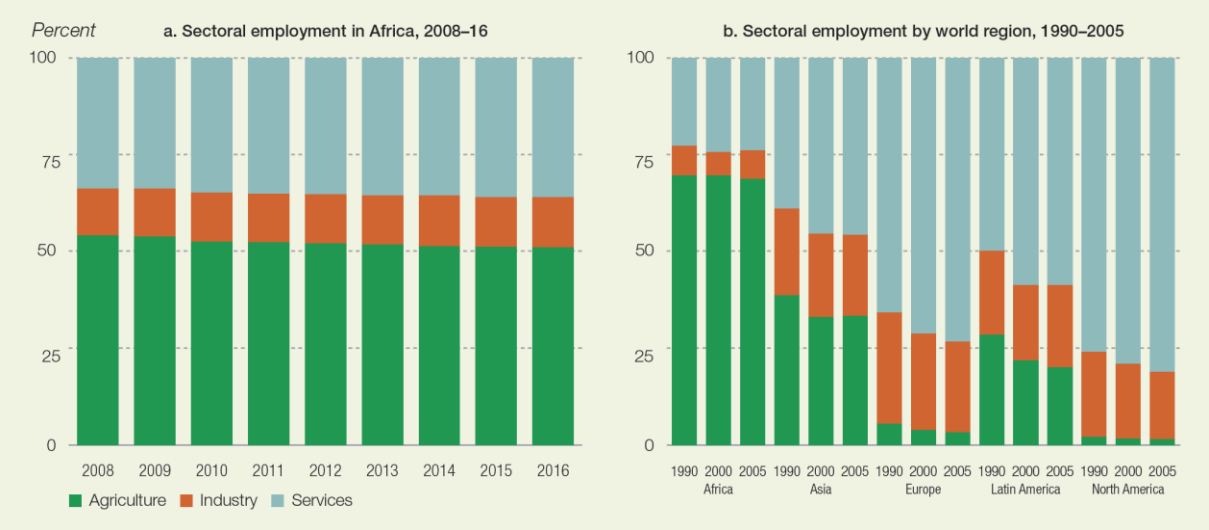
Appendix 2: Sectoral Changes in Africa's Fast Growing Countries, 2009-14

Changes of shares in GDP (in %)

	Agriculture, forestry, fishing and hunting	Mining and quarrying including oil and gas extraction	Manufacturing	Construction	Electricity, gas and water	Services
Burkina Faso	-0.7	5.4	-3.6	4.2	0.3	-5
Congo	0.1	-3.6	0.1	1.8	0.1	1.5
Democratic Republic of the Congo	-1.9	0.4	-1.5	0.5	0	2.5
Ethiopia	-10.2	0.6	0.3	4.1	-0.4	5.6
Ghana	-12.2	7.4	-1	3.7	-0.1	2.2
Kenya	3.3	0.2	-1.7	0.6	-0.3	-2.1
Malawi	-5.3	0.2	-2.1	1.9	-0.1	5.4
Mozambique	-2.2	2	-1.8	0.5	-0.1	1.6
Niger	-1.6	3.3	1	0	-0.1	-2.6
Nigeria	-16.1	-17.1	6.5	1.9	0.4	24.4
Rwanda	-1.2	1.1	-0.5	1.5	0.1	-1
Sierra Leone	-8.2	17.2	-0.6	-0.5	0.1	-8
Tanzania	1.5	1.6	0	2.1	-0.5	-4.7
Uganda	-2.5	-0.5	1.5	2.1	-0.4	-0.2
Zambia	-2.9	-2.3	-1.2	3.4	0.1	2.9

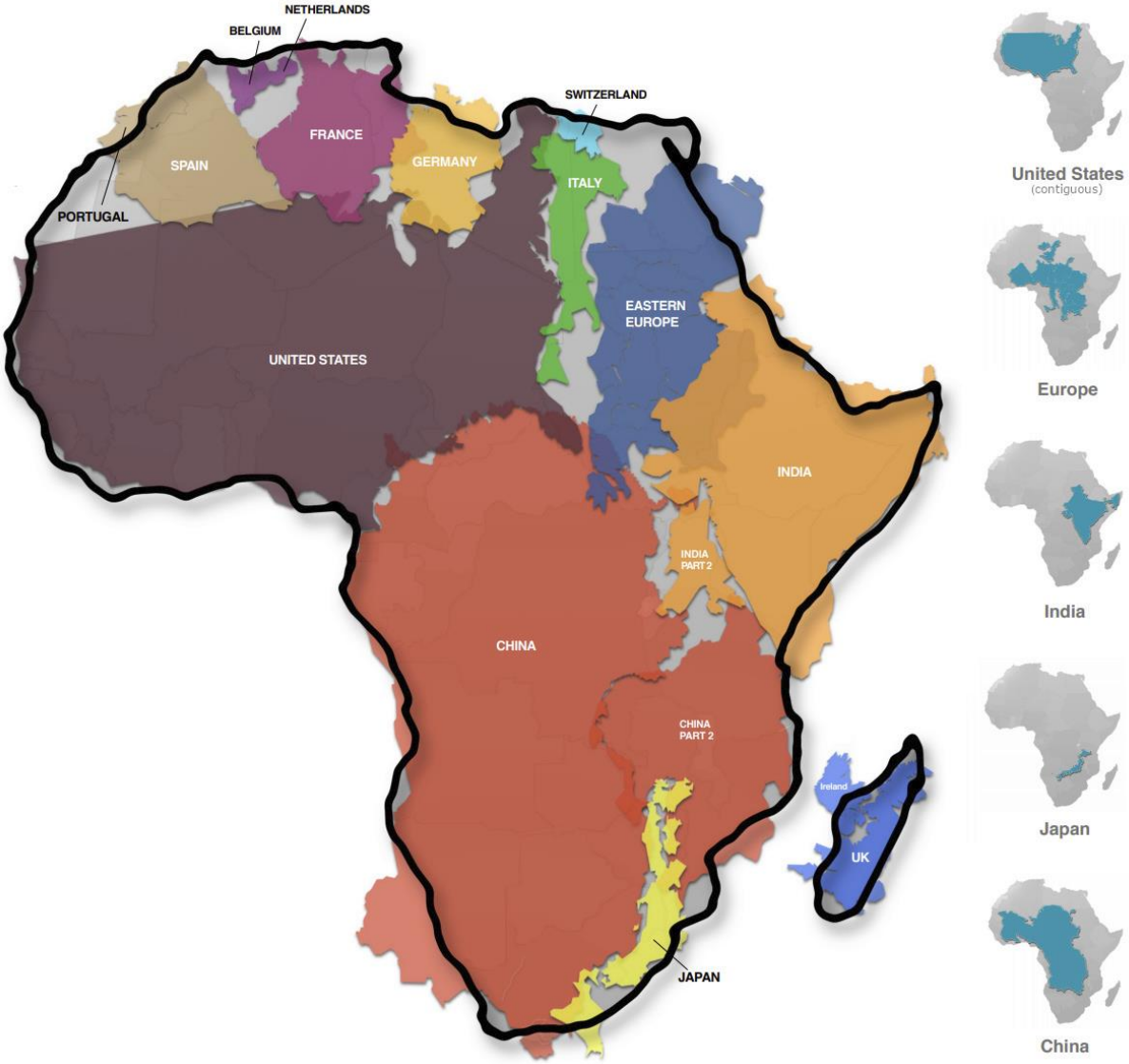
Source: AfDB (2016), p. 32.

Sectoral Employment Shares in Africa and other World Regions



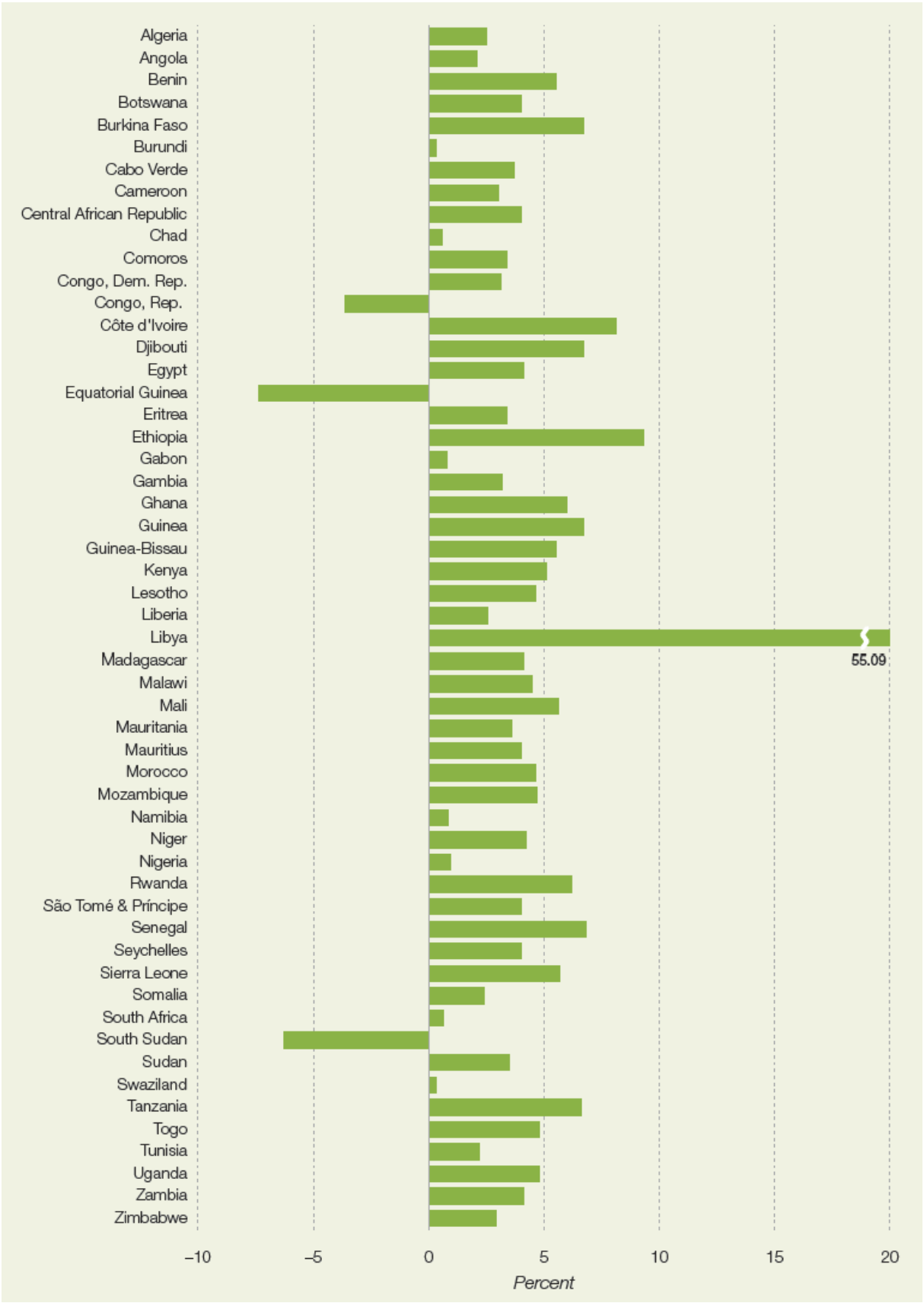
Source: AfDB (2018), p. 8.

Appendix 3: The True Size of Africa



Source: Desjardins (2020).

Appendix 4: GDP Growth in Selected Countries in Africa (2017)



Source: AfDB (2018), p. 10.

Appendix 5: Sub-Saharan Africa according to the UN Definition

Source: UN (2020).

Appendix 6: Economies by per Capita GNI

High-Income Economies ($12,376 OR MORE)		Upper-middle-Income Economies ($3,996 TO $12,375)	
Andorra	Kuwait	Albania	Namibia
Antigua and Barbuda	Latvia	Algeria	Nauru
Aruba	Liechtenstein	American Samoa	North Macedonia
Australia	Lithuania	Argentina	Paraguay
Austria	Luxembourg	Armenia	Peru
Bahamas, The	Macao SAR, China	Azerbaijan	Romania
Bahrain	Malta	Belarus	Russian Federation
Barbados	Monaco	Belize	Samoa
Belgium	Netherlands	Bosnia and Herzegovina	Serbia
Bermuda	New Caledonia	Botswana	Sri Lanka
British Virgin Islands	New Zealand	Brazil	South Africa
Brunei Darussalam	Northern Mariana Islands	Bulgaria	St. Lucia
Canada	Norway	China	St. Vincent and the Grenadines
Cayman Islands	Oman	Colombia	Suriname
Channel Islands	Palau	Costa Rica	Thailand
Chile	Panama	Cuba	Tonga
Croatia	Poland	Dominica	Turkey
Curaçao	Portugal	Dominican Republic	Turkmenistan
Cyprus	Puerto Rico	Equatorial Guinea	Tuvalu
Czech Republic	Qatar	Ecuador	Venezuela, RB
Denmark	San Marino	Fiji	
Estonia	Saudi Arabia	Gabon	
Faroe Islands	Seychelles	Georgia	
Finland	Singapore	Grenada	
France	Sint Maarten (Dutch part)	Guatemala	
French Polynesia	Slovak Republic	Guyana	
Germany	Slovenia	Iran, Islamic Rep.	
Gibraltar	Spain	Iraq	
Greece	St. Kitts and Nevis	Jamaica	
Greenland	St. Martin (French part)	Jordan	
Guam	Sweden	Kazakhstan	
Hong Kong SAR, China	Switzerland	Kosovo	
Hungary	Taiwan, China	Lebanon	
Iceland	Trinidad and Tobago	Libya	
Ireland	Turks and Caicos Islands	Malaysia	
Isle of Man	United Arab Emirates	Maldives	
Israel	United Kingdom	Marshall Islands	
Italy	United States	Mauritius	
Japan	Uruguay	Mexico	
Korea, Rep.	Virgin Islands (U.S.)	Montenegro	

Lower-middle Income Economies ($1,026 TO $3,995)		Low-Income Economies ($1,025 OR LESS)	
Angola	Micronesia, Fed. Sts.	Afghanistan	
Bangladesh	Moldova	Benin	South Sudan
Bhutan	Mongolia	Burkina Faso	Syrian Arab Republic
Bolivia	Morocco	Burundi	Tajikistan
Cabo Verde	Myanmar	Central African Republic	Tanzania
Cambodia	Nicaragua	Chad	Togo
Cameroon	Nigeria	Congo, Dem. Rep	Uganda
Comoros	Pakistan	Eritrea	Yemen, Rep.
Congo, Rep.	Papua New Guinea	Ethiopia	
Côte d'Ivoire	Philippines	Gambia, The	
Djibouti	São Tomé and Principe	Guinea	
Egypt, Arab Rep.	Senegal	Guinea-Bissau	
El Salvador	Solomon Islands	Haiti	
Eswatini	Sudan	Korea, Dem. People's Rep.	
Ghana	Timor-Leste	Liberia	
Honduras	Tunisia	Madagascar	
India	Ukraine	Malawi	
Indonesia	Uzbekistan	Mali	
Kenya	Vanuatu	Mozambique	
Kiribati	Vietnam	Nepal	
Kyrgyz Republic	West Bank and Gaza	Niger	
Lao PDR	Zambia	Rwanda	
Lesotho	Zimbabwe	Sierra Leone	
Mauritania		Somalia	

Economies of sub-Saharan Africa

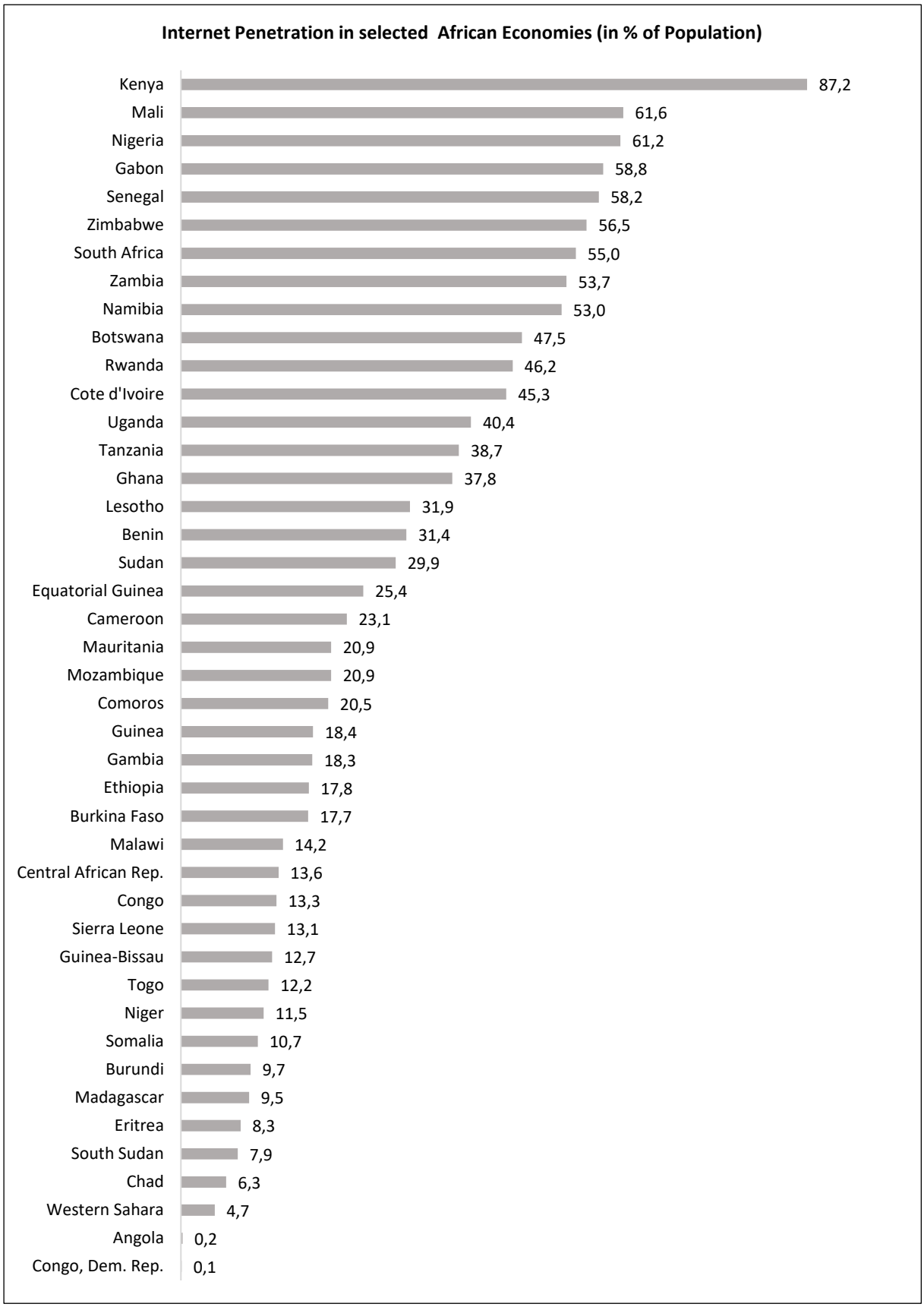
Source: World Bank (2020): https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

Appendix 7: IMF Country Classification: Emerging Markets and Developing Economies 2019

Commonwealth of Independent States	Emerging and Developing Asia	Emerging and Developing Europe	Latin America and the Caribbean	Middle East, North Africa, Afghanistan, and Pakistan	Sub-Saharan Africa
Armenia	Bangladesh	Albania	Antigua and Barbuda	Afghanistan	Angola	Nigeria
Azerbaijan	Bhutan	Bosnia and Herzegovina	Argentina	Algeria	Benin	Rwanda
Belarus	Brunei Darussalam	Bulgaria	Aruba	Bahrain	Botswana	São Tomé and Príncipe
Georgia	Cambodia	Croatia	The Bahamas	Djibouti	Burkina Faso	Senegal
Kazakhstan	China	Hungary	Barbados	Egypt	Burundi	Seychelles
Kyrgyz Republic	Fiji	Kosovo	Belize	Iran	Cabo Verde	Sierra Leone
Moldova	India	Montenegro	Bolivia	Iraq	Cameroon	South Africa
Russia	Indonesia	North Macedonia	Brazil	Jordan	Central African Republic	South Sudan
Tajikistan	Kiribati	Poland	Chile	Kuwait	Chad	Tanzania
Turkmenistan	Lao P.D.R.	Romania	Colombia	Lebanon	Comoros	Togo
Ukraine	Malaysia	Serbia	Costa Rica	Libya	Democratic Republic of	Uganda
Uzbekistan	Maldives	Turkey	Dominica	Mauritania	the Congo	Zambia
	Marshall Islands		Dominican Republic	Morocco	Republic of Congo	Zimbabwe
	Micronesia		Ecuador	Oman	Côte d'Ivoire	
	Mongolia		El Salvador	Pakistan	Equatorial Guinea	
	Myanmar		Grenada	Qatar	Eritrea	
	Nauru		Guatemala	Saudi Arabia	Eswatini	
	Nepal		Guyana	Somalia	Ethiopia	
	Palau		Haiti	Sudan	Gabon	
	Papua New Guinea		Honduras	Syria	TheGambia	
	Philippines		Jamaica	Tunisia	Ghana	
	Samoa		Mexico	UnitedArabEmirates	Guinea	
	Solomon Islands		Nicaragua	Yemen	Guinea-Bissau	
	Sri Lanka		Panama		Kenya	
	Thailand		Paraguay		Lesotho	
	Timor-Leste		Peru		Liberia	
	Tonga		St. Kitts and Nevis		Madagascar	
	Tuvalu		St. Lucia		Malawi	
	Vanuatu		St. Vincent and the		Mali	
	Vietnam		Grenadines		Mauritius	
			Suriname		Mozambique	
			Trinidad and Tobago		Namibia	
			Uruguay		Niger	

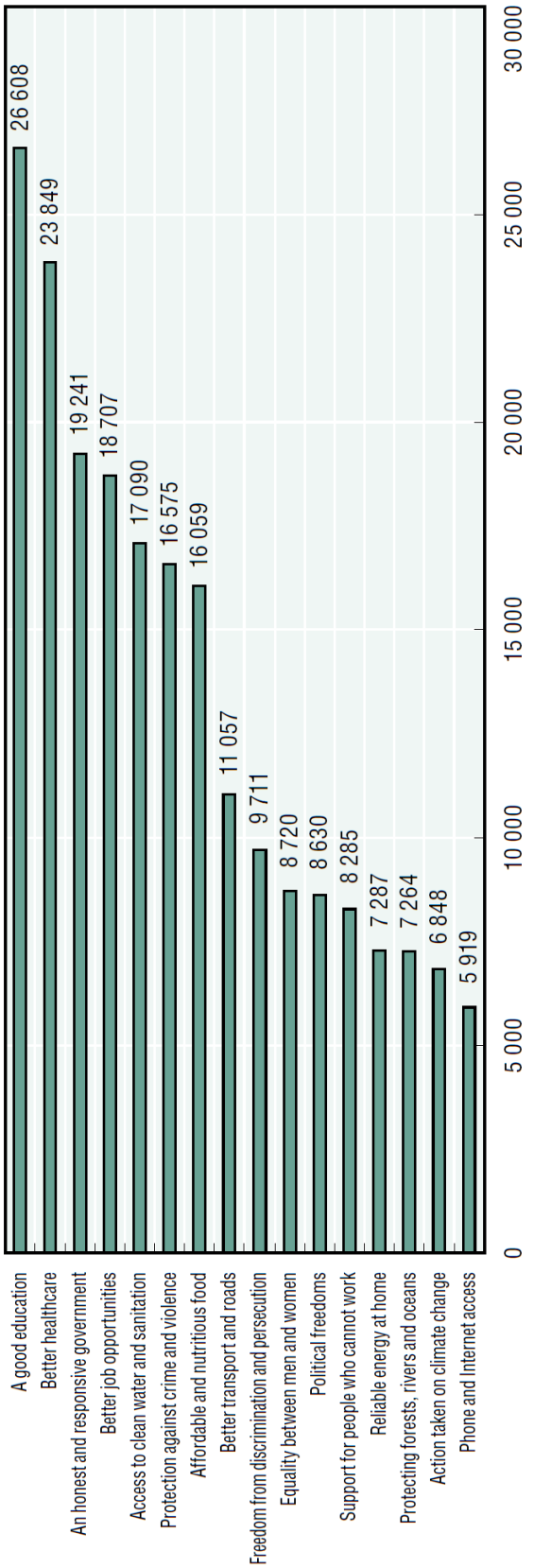
Source: IMF (2019).

Appendix 8: Internet Penetration in selected African Economies



Source: Internet World Stats (2020): https://www.internetworldstats.com/stats1.html.

Appendix 9: Top Priorities for African citizens



Source: AfDB (2016), p. 117.

Appendix 10: Interview Guideline A - Exploration

Introduction, Briefing and Consent

First, I would like to thank you for finding the time to participate in this interview.

1. Short presentation of the research project: The research project deals with the emergence of digital innovation in constrained environments with a major focus on sub-Saharan Africa (SSA). The basic aim of this study is to gain a deep understanding about the local innovation ecosystem and the opportunities for digital innovation to arise.
2. Duration: The interview is about to last between 45-60 Minutes.
3. Matters of confidentiality, and anonymity, and usage of data: The interview is highly confidential and anonymous, that means that I will choose a pseudonym that will be used instead of your real name. I will transcribe the recording afterwards and use it only for scientific purposes. Disguised extracts from the interview may be quoted in the final research report and in publications, but your identity will remain anonymous. Of course, your participation is entirely voluntary, and you can withdraw at any time or refuse to answer any question without any consequences of any kind. To be able to fully concentrate on what you say I would like to use a recorder during our conversation. Do you agree that the interview is being audio-recorded?

Questions

Self-introduction of the informant:

1. Please briefly describe your professional background, years of working experience, age and your role at the company?

Exploring the local innovation ecosystem

Digital Infrastructure

In the first step, I would like to talk to you about the current state of digitalization in the SSA region.

1. How well developed is the digital infrastructure? (Differences between rural and urban areas?)
2. What socio-economic impact can be expected from the digitalization in the SSA region?

Local Entrepreneurship Ecosystem

1. Who are the main actors/companies in the local innovation ecosystem?
2. What are the biggest challenges and opportunities that innovators are currently targeting?
3. What are the greatest entrepreneurial success stories?
4. What are the most promising startups? How relevant is their product/value proposition for the local market?
5. Are there any initiatives planned from the government targeting infrastructure building or public transportation? (Are any private firms or NGOs involved in these projects)
6. Are any private firms or NGOs fostering the development of digitalization in the local market?

Exploring Roles of Local Innovation Actors and Activities

1. Where do you see the so called “bottom of the pyramid” as innovation source or as target group?
2. Which multinationals drive innovation in in your country, if any?
3. Which role should multinational companies take in innovations processes?
4. Which resources should they contribute and where (money, R&D, market access, technology know-how)?
5. In your opinion, which are the most popular digital services/smartphone applications or future trends in the transportation sector?

Firm-specific Questions

Motivation and Business Model

1. What is your motivation?
2. What is the value proposition you offer to your customers?
3. What were the major challenges you encountered along the innovation process?
4. What innovation activities are your currently working on?

Follow-up Questions

a. What is your approach/strategy? (Customer Segment, B2B/B2C, product/service, digital KPIs, core activities, etc.)
b. What do you consider your core competencies?
c. What are the biggest challenges and opportunities for running an IT-based services in these constrained environments?
d. What are the key enablers?
e. Who are the most important stakeholders?

Appendix 11: Interview Guideline B – Case Candidates

Introduction, Briefing and Consent

First, I would like to thank you for finding the time to participate in this interview.

1. Short presentation of the Research Project: The research project deals with the development and implementation of digital service innovation in constrained environments. The basic aim of this study is to identify the key constraints, that you have encountered during the innovation process and what were the key actions you have taken to respond to these constraints.
2. Duration: The interview is about to last between 45-60 Minutes.
3. Matters of confidentiality, and anonymity, and usage of data: The interview is highly confidential and anonymous, that means that I will choose a pseudonym that will be used instead of your real name. I will transcribe the recording afterwards and use it only for scientific purposes. Disguised extracts from the interview may be quoted in the final research report and in publications, but your identity will remain anonymous. Of course, your participation is entirely voluntary, and you can withdraw at any time or refuse to answer any question without any consequences of any kind. In order to be able to fully concentrate on what you say I would like to use a recorder during our conversation. Do you agree that the interview is being audio-recorded?

Questions

Self-introduction of the Interviewee

1. Please briefly describe your professional background, years of working experience, age and your role at the company?
2. What has been the motivation behind this service?

Local Innovation Environment and Transportation Sector

1. What are the biggest challenges and opportunities in your country and the African Market?
2. What are the biggest challenges and opportunities in the transportation sector?

Experienced Constraints

1. What are the major constraints you experienced in the local environment?

Follow up Questions?

a. What were major institutional shortcomings you have been confronted with as a service provider?
b. What were major resource constraints?
c. Could you kindly give an example of the constraint?

Service Concept

1. Please describe in detail the service concept (value proposition)?

Follow-up Questions

a. Which customer segment are you targeting? How do you raise awareness for the service? How do you convince/make sense to use you service (acceptability)?
b. What is necessary to involve less affluent customers?
c. In what ways is the service innovative compared to existing services?
d. How do you plan to scale the service?
e. What other (e.g., socio-economic) impact does the service create?

Service Development and Implementation

1. What were/are some of the key challenges experienced during the development and implementation phase of service innovations? And how did you respond to them?
2. What were the key service development activities? What were the key service development activities?
3. What do you associate with design? What role did or does design play in service development?
4. How did you leverage digital technology?

Follow-up Questions on Partner Integration

a. What role do partners play for the service? (Could you provide examples of partnerships?)
b. How do you select the service partners/drivers?
c. How do you convince partners to join your platform?

USE of Digital Technology

1. What are the various innovative ways in which digital technology is being used by your firm for serving the customers in a more efficient way?
2. What role will digital services play in the future for transport ion in sub-Saharan Africa?

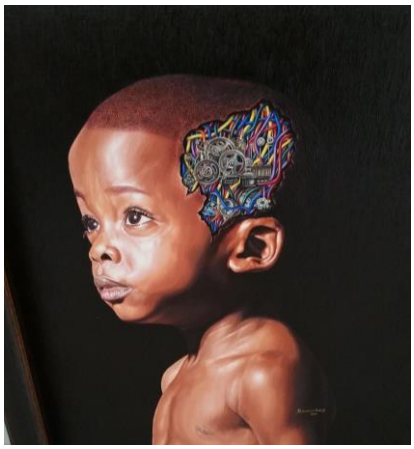
Role of Trust

1. How did you experience the lack of trust? (Could you report on some specific situations?)
2. Why is trust important?
3. Why do you think customers trust your service?
4. Do you think peer-to-peer services could work in the local market?
5. Is the market ready for digital services?

Appendix 12: Startup Working Environment

First top left: Maker space in Nairobi “Gear Box”; Second left: Co-Working space in Nairobi; Third left: Prototype testing, Co-working space in Lagos; Right side: Startup offices.

Appendix 13: Local Problems Expressed in Artwork



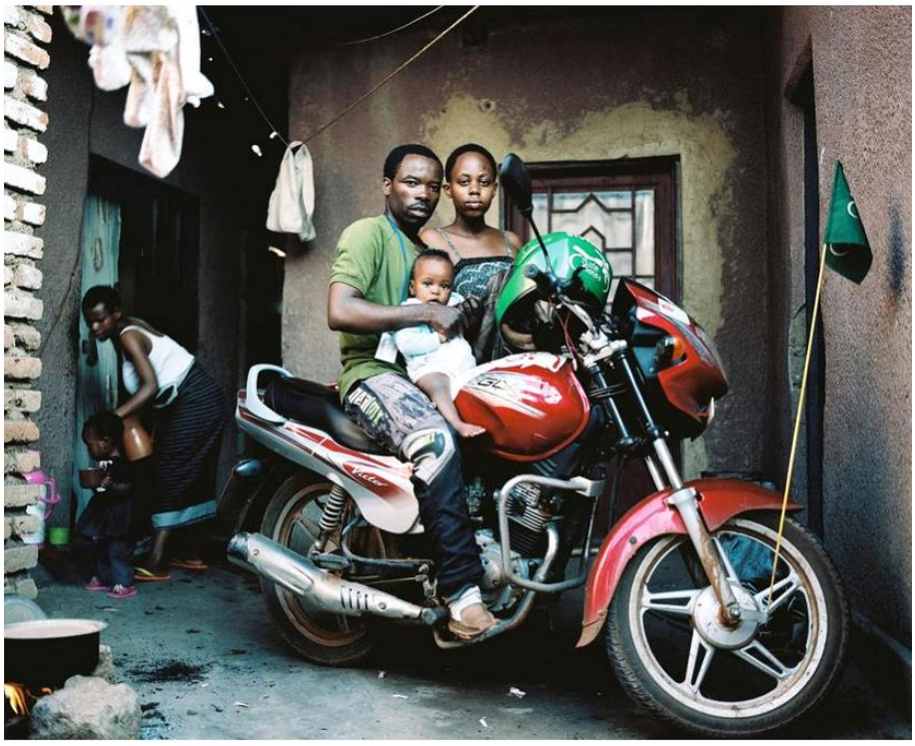
Nike Centre for Art and Culture, Lagos

Appendix 14: Traffic Situation in African urban centers






Appendix 15: Employment Creation



Marcelin and his family and home in the Kigali slum, Gasabo. “I started working with SafeMotos in 2015. Working with Motorcycle Taxi has been life changing for me, I was able to marry my wife, and paid off my debt which was to a tune of 1.5 million francs. I now lead a team of drivers at safe motos which is an honor able thing for me.”

Female drivers

Appendix 16: Alphabet's Loon project

Googles parent company Alphabet's Loon project has finally launched its Internet delivery balloons in Africa following a deal with the Kenyan government. A Loon Internet balloon, carrying solar-powered mobile networking equipment. The balloons started delivering Internet access to Kenya. (The New York Times, 7 July 2020)

Each balloon is the size of a tennis court and made from sheets of polyethylene. (The New York Times, 7 July 2020)

BIBLIOGRAPHY

Acumen (**2016**): Lessons Learned: 15 Years of Tackling Poverty. URL: https://acumenideas.com/lesson-one-e880f08f0a0 [06.12.2019].

Adomavicius, G.; Bockstedt, J. C.; Gupta, A. & Kauffman, R. J. (**2008**): Making Sense of Technology Trends in the Information Technology Landscape: A Design Science Approach. *MIS Quarterly*, 32 (4), pp. 779–809.

AfDB (**2010**): African Natural Resources Center: Catalyzing Growth and Development through Effective Natural Resources Management. African Development Bank Group.

AfDB (**2014**): Annual Report 2014. African Development Bank Group.

AfDB (**2016**): African Economic Outlook 2016: Sustainable Cities and Structural Transformation, Paris: OECD Publishing.

AfDB (**2018**): African Economic Outlook 2018. African Development Bank Group, Paris.

AfDB (**2019**): African Economic Outlook 2019. African Development Bank Group.

African Union (**2019**): Agenda 2063: The Africa We Want. URL: https://au.int/en/agenda2063/overview [15.09.2020].

Agarwal, N. (**2016**): Innovation Landscape in Developed and Developing Markets: A Conceptual and Empirical Study on Technology Convergence and Low Cost Innovations. *Schriften aus der Fakultät Sozial- und Wirtschaftswissenschaften der Otto-Friedrich-Universität Bamberg*. University of Bamberg Press.

Agarwal, N. & Brem, A. (**2012**): Frugal and Reverse Innovation: Literature Overview and Case Study Insights from a German MNC in India and China. In: Thoben, Klaus-Dieter; Katzy, Bernhard: *2012 18th International ICE Conference on Engineering, Technology and Innovation (ICE 2012): Munich, Germany, 18 - 20 June 2012*. Piscataway, NJ. IEEE, pp. 1–11.

Agarwal, N.; Grottke, M.; Mishra, S. & Brem, A. (**2017**): A Systematic Literature Review of Constraint-based Innovations: State of the Art and Future Perspectives. *IEEE Transactions on Engineering Management*, 64 (1), pp. 3–15.

Ahlstrom, D. (**2010**): Innovation and Growth: How Business Contributes to Society. *Academy of Management Perspectives*, 24 (3), pp. 11–24.

Ahuja, S. & Chan, Y. E. (**2014**): The Enabling Role of IT in Frugal Innovation. *Proceedings of the International Conference on Information Systems*. The Annual Meeting of the Academy of Management, Anaheim, USA.

Ahuja, S. & Chan, Y. E. (**2016**): Digital Innovation: A Frugal Ecosystem Perspective. *Thirty Seventh International Conference on Information Systems*, Dublin.

Akaka, M. A.; Vargo, S. L. & Lusch, R. F. (**2013**): The Complexity of Context: A Service Ecosystems Approach for International Marketing. *Journal of International Marketing*, 21 (4), pp. 1–20.

Akerlof, G. A. (**1970**): The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, 84 (3), pp. 488–500.

Alam, I. (**2007**): New Service Development Process: Emerging versus Developed Markets. *Journal of Global Marketing*, 20 (2-3), pp. 43–55.

Alvstam, C. G.; Ström, P. & Wentrup, R. (**2016**): Heterogeneous Economic Space in a Global Archipelago: An Economic Geography Perspective of Emerging Markets. In: Merchant, H.: *Handbook of Contemporary Research on Emerging Markets*. Cheltenham, UK. Edward Elgar Publishing, pp. 38–61.

Amabile, T. M. (**1996**): Creativity in Context: Update to the Social Psychology of Creativity, Boulder, Colo.: Westview Press.

Anand, M. & Monin, P. (**2013**): Innovation Processes in Emerging Markets: Empirical Evidence from the Indian Insurance Industry. *Management international*, 18 (1), pp. 40–57.

Anderson, J. & Billou, N. (**2007**): Serving the World´s Poor: Innovation at the Base of the Economic Pyramid. *Journal of Business Strategy*, 28 (2), pp. 14–21.

Anderson, J. & Markides, C. (**2007**): Strategic Innovation at the Base of the Pyramid. *MIT Sloan Management Review*, 49 (1), pp. 83–88.

Angeli, F. & Jaiswal, A. K. (**2016**): Business Model Innovation for Inclusive Health Care Delivery at the Bottom of the Pyramid. *Organization & Environment*, 29 (4), pp. 486–507.

Anokhin, S. & Schulze, W. S. (**2009**): Entrepreneurship, Innovation, and Corruption. *Journal of Business Venturing*, 24 (5), pp. 465–476.

Ansari, S.; Munir, K. & Gregg, T. (**2012**): Impact at the 'Bottom of the Pyramid': The Role of Social Capital in Capability Development and Community Empowerment. *Journal of Management Studies*, 49 (4), pp. 813–842.

Anushkina, O. E.; Merchant, H.; Trinca Colonel, R. & Berselli, E. (**2016**): How do Emerging Markets Differ from Developed Markets?: A Conceptual and Empirical Analysis. In: Merchant, H.: *Handbook of Contemporary Research on Emerging Markets*. Cheltenham, UK. Edward Elgar Publishing, pp. 3–37.

Arnold, D. J. & Quelch, J. A. (**1998**): New Strategies in Emerging Markets. *Sloan Management Review*, 40 (1), pp. 7–20.

Arrow, K. J. (**1973**): Information and Economic Behavior. Federation of Swedish Industries, Stockholm, Sweden.

Ault, J. K. & Spicer, A. (**2014**): The Institutional Context of Poverty: State Fragility as a Predictor of Cross-national Variation in Commercial Microfinance Lending. *Strategic Management Journal*, 35 (12), pp. 1818–1838.

Baghudana, A. & Leis, J. (**2015**): Navigating Nairobi: Digital Innovation in Urban Transport and Logistics in Kenya. The Fletcher School's Institute for Business in the Global Context, Medford, MA.

BAH (**1982**): New Products Management for the 1980s, New York: Booz, Allen & Hamilton.

Baker, T. (**2007**): Resources in Play: Bricolage in the Toy Store(y). *Journal of Business Venturing*, 22 (5), pp. 694–711.

Baker, T. & Nelson, R. E. (**2005**): Creating Something from Nothing: Resource Construction Through Entrepreneurial Bricolage. *Administrative Science Quarterly*, 50 (3), pp. 329–366.

Barber, B. (**1983**): The Logic and Limits of Trust, New Brunswick, N.J: Rutgers University Press.

Baregheh, A.; Rowley, J. & Sambrook, S. (**2009**): Towards a Multidisciplinary Definition of Innovation. *Management Decision*, 47 (8), pp. 1323–1339.

Barile, S.; Lusch, R. F.; Reynoso, J.; Saviano, M. & Spohrer, J. (**2016**): Systems, Networks, and Ecosystems in Service Research. *Journal of Services Management*, 27 (4), pp. 652–674.

Barney, J. B. (**1991**): Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17 (1), pp. 99–120.

Barras, R. (**1990**): Interactive Innovation in Financial and Business Services: The Vanguard of the Service Revolution. *Research Policy*, 19 (3), pp. 215–237.

Barrett, M.; Davisdon, E.; Prabhu, J. & Vargo, S. L. (**2015**): Service Innovation in the Digital Age: Key Contributions and Future Directions. *MIS Quarterly*, 39 (1), pp. 135–154.

Bastiat, F. (**1860**): Harmonies of Political Economy, London: John Murray.

Ben Letaifa, S. (**2014**): The Uneasy Transition from Supply Chains to Ecosystems: The Value-creation/Value-capture Dilemma. *Management Decision*, 52 (2), pp. 278–295.

Ben Letaifa, S. & Reynoso, J. (**2015**): Toward a Service Ecosystem Perspective at the Base of the Pyramid. *Journal of Service Management*, 26 (5), pp. 684–705.

Benkler, Y. (**2006**): The Wealth of Networks: How Social Production Transforms Markets and Freedom, New Haven Conn.: Yale University Press.

Benner, M. J. & Tushman, M. L. (**2015**): Reflections on the 2013 Decade Award: "Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited" Ten Years Later. *Academy of Management Review*, 40 (4), pp. 1–18.

Berger, E. & Nakata, C. (**2013**): Implementing Technologies for Financial Service Innovations in Base of the Pyramid Markets. *Journal of Product Innovation Management*, 30 (6), pp. 1199–1211.

Berry, L. L. & Parasuraman, A. (**1991**): Marketing Services: Competing through Quality, Toronto, New York: Maxwell Macmillan Canada; Free Press.

Bhatti, Y. A. (**2012**): What is Frugal, What is Innovation?: Towards a Theory of Frugal Innovation. *Working Paper Series*. Said Business School.

Bhatti, Y. A. & Ventresca, M. (**2013**): How can 'Frugal Innovation' be Conceptualized? *Working Paper Series*. Said Business School, Oxford.

Bilgram, V.; Brem, A. & Voigt, K.-I. (**2008**): User-centric Innovations in New Product Development: Systematic Identification of Lead Users Harnessing Interactive and Collaborative Online-tools. *International Journal of Innovation Management*, 12 (3), pp. 419–458.

Blazevic, V. & Lievens, A. (**2008**): Managing Innovation through Customer Coproduced Knowledge in Electronic Services: An Exploratory Study. *Journal of the Academy of Marketing Science*, 36 (1), pp. 138–151.

Boland, R. J.; Lyytinen, K. & Yoo, Y. (**2007**): Wakes of Innovation in Project Networks: The Case of Digital 3-D Representations in Architecture, Engineering, and Construction. *Organization Science*, 18 (4), pp. 631–647.

Bolton, G.; Greiner, B. & Ockenfels, A. (**2013**): Engineering Trust: Reciprocity in the Production of Reputation Information. *Management Science*, 59 (2), pp. 265–285.

Bound, K. & Thornton, I. (**2012**): Our Frugal Future: Lesson from India's Innovation System, London: NESTA.

Bouwman, H. & Fielt, E. (**2008**): Service Innovation and Business Models. In: Bouwman, Harry; Haaker, Timber; Vos, Henny: *Mobile Service Innovation and Business Models*. Berlin, Heidelberg. Springer-Verlag, pp. 9–30.

Bouwman, H.; Haaker, T. & Vos, H. (**2008**): Mobile Service Innovation and Business Models, Berlin, Heidelberg: Springer-Verlag.

Bower, J. L. & Christensen, C. M. (**1995**): Disruptive Technologies: Catching the Wave. *Harvard Business Review*, 73 (1), pp. 43–53.

Bradley, S. W.; McMullen, J. S.; Artz, K. & Simiyu, E. M. (**2012**): Capital Is Not Enough: Innovation in Developing Economies. *Journal of Management Studies*, 49 (4), pp. 684–717.

Brown, T. (**2008**): Design Thinking. *Harvard Business Review*, 86 (6), pp. 84–92.

Brown, T. (**2009**): Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, New York, NY: Harper Business.

Brown, T. & Wyatt, J. (**2010**): Design Thinking for Social Innovation. *Stanford Social Innovation Review*, 8 (1), pp. 31–35.

Bruton, G. D.; Ketchen, D. J., **Jr. & Ireland, R. D.** (**2013**): Entrepreneurship as a Solution to Poverty. *Journal of Business Venturing*, 28 (6), pp. 683–689.

Bryceson, D. F.; Mbara, T. C. & Maunder, D. (**2003**): Livelihoods, Daily Mobility and Poverty in Sub-Saharan Africa. *Transport Reviews*, 23 (2), pp. 177–196.

Bryson, J.; Daniels, P. & Warf, B. (**2013**): Service Worlds: People, Organisations, Technologies, Hoboken: Taylor and Francis.

Bucciarelli, L. L. (**1994**): Designing Engineers, Cambridge, MA: MIT Press.

Buchanan, R. (**1992**): Wicked Problems in Design Thinking. *Design Issues*, 8 (2), pp. 5–21.

Cadwallader, S.; Jarvis, C. B.; Bitner, M. J. & Ostrom, A. L. (**2010**): Frontline Employee Motivation to Participate in Service Innovation Implementation. *Journal of the Academy of Marketing Science*, 38 (2), pp. 219–239.

Calabretta, G.; Gemser, G. & Karpen, I. (**2016**): Strategic Design: Eight Essential Practices Every Strategic Designer Must Master, Amsterdam: BIS Publisher.

Calabretta, G. & Kleinsmann, M. (**2017**): Technology-driven Evolution of Design Practices: Envisioning the Role of Design in the Digital Era. *Journal of Marketing Management*, 33 (3-4), pp. 292–304.

Carlsson, B.; Braunerhjelm, P.; McKelvey, M.; Olofsson, C.; Persson, L. & Ylinenpää, H. (**2013**): The Evolving Domain of Entrepreneurship Research. *Small Business Economics*, 41 (4), pp. 913–930.

Chandra, M. & Neelankavil, J. P. (**2008**): Product Development and Innovation for Developing Countries: Potential and Challenges. *Journal of Management Development*, 27 (10), pp. 1017–1025.

Charmaz, K. (**2014**): Constructing Grounded Theory. 2, Los Angeles, London, New Delhi, Singapore, Washington DC: SAGE.

Chen, J.; Yin, X. & Mei, L. (**2018**): Holistic Innovation: An Emerging Innovation Paradigm. *International Journal of Innovation Studies*, 2 (1), pp. 1–13.

Chen, J.-S.; Tsou, H.-T. & Ching, R. K. (**2011**): Co-production and Its Effects on Service Innovation. *Industrial Marketing Management*, 40 (8), pp. 1331–1346.

Chesbrough, H. (**2002**): The Role of the Business Model in Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spin-off Companies. *Industrial and Corporate Change*, 11 (3), pp. 529–555.

Chesbrough, H. W. (**2003**): Open Innovation: The New Imperative for Creating and Profiting from Technology, Boston, Massachusetts: Harvard Business School Press.

Chironga, M.; Leke, A.; Lund, S. & van Wamelen, A. (**2011**): Cracking the Next Growth Market: Africa. *Harvard Business Review*, 89 (5), pp. 117–122.

Chliova, M. & Ringov, D. (**2017**): Scaling Impact: Template Development and Replication at the Base of the Pyramid. *Academy of Management Perspectives*, 31 (1), pp. 44–62.

Christensen, C. M. (**1997**): The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, Cambridge, MA: Harvard Business Press.

Christensen, C. M. (**2013**): The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Paperback, Boston, Massachusetts: Harvard Business Review Press.

Christensen, C. M.; Baumann, H.; Ruggles, R. & Sadtler, T. M. (**2006**): Disruptive Innovation for Social Change. *Harvard Business Review*, 84 (12), pp. 94–101.

Ciborra, C. U. (**1996**): The Platform Organization: Recombining Strategies, Structures, and Surprises. *Organization Science*, 7 (2), pp. 103–118.

Ciriello, R. F.; Schwabe, G. & Richter, A. (**2017**): From Process to Practice: Towards a Practice-based Model of Digital Innovation. 38th International Conference on Information Systems, South Korea.

Clark, K. B. (**1985**): The Interaction of Design Hierarchies and Market Concepts in Technological Evolution. *Research Policy*, 14 (5), pp. 235–251.

Clausen, T. (**2009**): Outlining the Distinguishing Characteristics of an Evolutionary Theory of Innovation. Nordland Research Institute and TIK, University of Oslo.

Cohen, L.; Manion, L. & Morrison, K. (**2007**): Research Methods in Education. 6. ed., London: Routledge.

Collier, P. & Gunning, J. W. (**1999**): Why Has Africa Grown Slowly? *The Journal of Economic Perspectives*, 13 (3), pp. 3–22.

Coombs, R. & Miles, I. (**2000**): Innovation, Measurement and Services: The New Problematique. In: Metcalfe, J. Stanley; Miles, Ian: *Innovation Systems in the Service Economy: Measurement and Case Study Analysis*. Boston, MA. Springer, pp. 85–103.

Cooper, R. G. (**1990**): Stage-gate Systems: A New Tool for Managing New Products. *Business Horizons*, 33 (3), pp. 44–54.

Cooper, R. G. (**1994**): Third-generation New Product Processes. *Journal of Product Innovation Management*, 11 (1), pp. 3–14.

Cooper, R. G.; Edgett, S. J. & Kleinschmidt, E. J. (**2004**): Benchmarking Best NPD Practices II. *Research-Technology Management*, 47 (3), pp. 50–59.

Corbin, J. & Strauss, A. (**1990**): Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. *Qualitative Sociology*, 13 (1), pp. 3–21.

Corbin, J. & Strauss, A. L. (**2015**): Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. 4, Los Angeles, London, New Delhi, Singapore, Washington DC, Boston: SAGE.

Cross, N. (**2006**): Designerly Ways of Knowing, London: Springer-Verlag London Limited.

Crotty, M. (**1998**): The Foundations of Social Research: Meaning and Perspective in the Research Process, London: Sage Publications.

Cunha, M. P. e.; Rego, A.; Oliveira, P.; Rosado, P. & Habib, N. (**2014**): Product Innovation in Resource-poor Environments: Three Research Streams. *Journal of Product Innovation Management*, 31 (2), pp. 202–210.

Davis, F. D. (**1989**): Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13 (3), pp. 319–340.

Day, G. S. (**1994**): The Capabilities of Market-driven Organizations. *Journal of Marketing*, 58 (4), pp. 37–52.

De Soto, H. (**2003**): The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else, New York: Basic Books.

den Hertog, P. (**2000**): Knowledge-intensive Business Services as Co-producers of Innovation. *International Journal of Innovation Management*, 4 (4), pp. 491–528.

den Hertog, P.; van der Aa, W. & de Jong, M. W. (**2010**): Capabilities for Managing Service Innovation: Towards a Conceptual Framework. *Journal of Service Management*, 21 (4), pp. 490–514.

Desjardins, J. (**2020**): Mapped: Visualizing the True Size of Africa. Visual Capitalist. URL: https://www.visualcapitalist.com/map-true-size-of-africa/ [05.05.2020].

Dewan, S.; Ganley, D. & Kraemer, K. L. (**2010**): Complementarities in the Diffusion of Personal Computers and the Internet: Implications for the Global Digital Divide. *Information Systems Research*, 21 (4), pp. 925–940.

Dewan, S. & Riggins, F. J. (**2005**): The Digital Divide: Journal of the Association for Information Systems. *Journal of the Association for Information Systems*, 6 (12), pp. 298–337.

Dia, M. (**1996**): Africa's Management in the 1990s and Beyond: Reconciling Indigenous and Transplanted Institutions, Washington, DC: World Bank.

Diaz Olvera, L.; Plat, D. & Pochet, P. (**2013**): The Puzzle of Mobility and Access to the City in Sub-Saharan Africa. *Journal of Transport Geography*, 32, pp. 56–64.

Diomande, M. (**1990**): Business Creation with Minimal Resources: Some Lessons from the African Experience. *Journal of Business Venturing*, 5 (4), pp. 191–200.

Dodgson, M.; Gann, D. M. & Phillips, N. (**2014**): Perspectives on Innovation Management. In: Dodgson, Mark; Gann, David M.; Phillips, Nelson: *The Oxford Handbook of Innovation Management*. Oxford. Oxford University Press, pp. 3–24.

Donaldson, K. M. (**2006**): Product Design in Less Industrialized Economies: Constraints and Opportunities in Kenya. *Research in Engineering Design*, 17 (3), pp. 135–155.

Dosi, G. (**2013**): Innovation, Evolution, and Economics: Where We Are and Where We Should Go. In: Fagerberg, Jan; Martin, Ben R.; Andersen, E. S.: *Innovation Studies Evolution and Future Challenges*. Oxford (UK). Oxford University Press, pp. 111–133.

Drejer, I. (**2004**): Identifying Innovation in Surveys of Services: A Schumpeterian Perspective. *Research Policy*, 33 (3), pp. 551–562.

Droege, H.; Hildebrand, D. & Heras Forcada, M. A. (**2009**): Innovation in Services: Present Findings, and Future Pathways. *Journal of Service Management*, 20 (2), pp. 131–155.

Duymedjian, R. & Rüling, C.-C. (**2010**): Towards a Foundation of Bricolage in Organization and Management Theory. *Organization Studies*, 31 (2), pp. 133–151.

Edvardsson, B.; Tronvoll, B. & Gruber, T. (**2011**): Expanding Understanding of Service Exchange and Value Co-creation: A Social Construction Approach. *Journal of the Academy of Marketing Science*, 39 (2), pp. 327–339.

Edwards-Schachter, M. (**2018**): The Nature and Variety of Innovation. *International Journal of Innovation Studies*, 2 (2), pp. 65–79.

Eisenhardt, K. M. (**1989**): Building Theories from Case Study Research. *The Academy of Management Review*, 14 (4), pp. 532–550.

Eisenhardt, K. M. & Graebner, M. E. (**2007**): Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50 (1), pp. 25–32.

Ellen, R. F. (**1984**): Ethnographic Research: A Guide to General Conduct, New York, NY: Academic Press.

Evans, D. S. & Schmalensee, R. (**2016**): Matchmakers: The New Economics of Multisided Platforms, Boston, Massachusetts: Harvard Business Review Press.

Fagerberg, J. (**2013**): Innovation: A Guide to the Literature. In: Fagerberg, Jan; Mowery, David C.; Nelson, Richard R.: *The Oxford Handbook of Innovation*. Oxford. Oxford University Press, pp. 1–26.

Fagerberg, J.; Martin, B. R. & Andersen, E. S. (**2013**): Innovation Studies: Towards a New Agenda. In: Fagerberg, Jan; Martin, Ben R.; Andersen, E. S.: *Innovation Studies Evolution and Future Challenges*. Oxford (UK). Oxford University Press, pp. 1–17.

Farrell, J. & Weiser, P. (**2003**): Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age. *Harvard Journal of Law and Technology*, 17 (1), pp. 85–134.

Filstead, W. J. (**1970**): Qualitative Methodology: Firsthand Involvement with the Social World, Chicago: Rand McNally.

Fisher, R. & Robinson, B. (**2019**): Lagos, Nigeria: Improving Sidewalks to Enable Safe NMT in one of Africa's Largest Cities. TUMI. URL: https://www.transformative-mobility.org/publications/lagos-nigeria-improving-sidewalks-to-enable-safe-nmt-in-one-of-africas-largest-cities [14.06.2020].

Fitzsimmons, J. A. & Fitzsimmons, M. J. (**2000**): New Service Development: Creating Memorable Experiences, Thousand Oaks, Calif: Sage Publications.

Flavián, C.; Guinalíu, M. & Gurrea, R. (**2006**): The Role Played by Perceived Usability, Satisfaction and Consumer Trust on Website Loyalty. *Information & Management*, 43 (1), pp. 1–14.

Flick, U. (**2004**): Constructivism. In: Flick, Uwe; Kardorff, Ernst von; Steinke, Ines: *A Companion to Qualitative Research*. London. SAGE, pp. 88–94.

Flick, U.; Kardorff, E. von & Steinke, I. (**2004**): What is Qualitative Research: An Introduction to the Field. In: Flick, Uwe; Kardorff, Ernst von; Steinke, Ines: *A Companion to Qualitative Research*. London. SAGE, pp. 3–11.

Flikkema, M.; Jansen, P. & van der Sluis, L. (**2007**): Identifying Neo-Schumpeterian Innovation in Service Firms: A Conceptual Essay with a Novel Classification. *Economics of Innovation and New Technology*, 16 (7), pp. 541–558.

Foster, C. & Heeks, R. (**2013**): Innovation and Scaling of ICT for the Bottom-of-the-pyramid. *Journal of Information Technology*, 28 (4), pp. 296–315.

Frankfort-Nachmias, C. & Nachmias, D. (**1992**): Research Methods in the Social Sciences. 4, London: Arnold.

Franklin, S. (**2018**): Location, Search Costs and Youth Unemployment: Experimental Evidence from Transport Subsidies. *The Economic Journal*, 128 (614), pp. 2353–2379.

Frei, F. X. (**2008**): The Four Things a Service Business Must Get Right. *Harvard Business Review*, 86 (4), 70-80.

Freiling, J. (**2004**): A Competence-based Theory of the Firm. *Management Revue*, 15 (1), pp. 27–52.

Friedland, R. & Alford, R. R. (**1991**): Bringing Society Back In: Symbols, Practices, and Institutional Contradictions. In: Powell, Walter W.; DiMaggio, Paul: *The New Institutionalism in Organizational Analysis*. Chicago, Ill. Univ. of Chicago Press, pp. 267–292.

Froehle, C. M.; Roth, A. V.; Chase, R. B. & Voss, C. A. (**2000**): Antecedents of New Service Development Effectiveness: An Exploratory Examination of Strategic Operations Choices. *Journal of Service Research*, 3 (1), pp. 3–17.

Fuglsang, L. & Sørensen, F. (**2011**): The Balance Between Bricolage and Innovation: Management Dilemmas in Sustainable Public Innovation. *The Service Industries Journal*, 31 (4), pp. 581–595.

Fukuyama, F. (**1995**): Trust: The Social Virtues and the Creation of Prosperity, New York, NY: Free Press.

Furlong, D. (**1996**): The Conceptualization of 'Trust' in Economic Thought. *IDS Working Paper 35*. IDS, Brighton.

Gall, M. D.; Gall, J. P. & Borg, W. R. (**2002**): Educational Research: An Introduction. 7, Boston, MA: Pearson.

Gallouj, F. (**2002**): Innovation in the Service Economy: The New Wealth of Nations, Cheltenham, UK: Edward Elgar.

Gallouj, F. & Weinstein, O. (**1997**): Innovation in Services. *Research Policy*, 26 (4-5), pp. 537–556.

Gambetta, D. (**1988**): Can We Trust Trust? In: Gambetta, Diego: *Trust: Making and Breaking Cooperative Relations*. Oxford, UK. Basil Blackwell, pp. 213–237.

Gao, L. S. & Iyer, B. (**2006**): Analyzing Complementarities Using Software Stacks for Software Industry Acquisitions. *Journal of Management Information Systems*, 23 (2), pp. 119–147.

Garcia, R. & Calantone, R. (**2002**): A Critical Look at Technological Innovation Typology and Innovativeness Terminology: A Literature Review. *Journal of Product Innovation Management*, 19 (2), pp. 110–132.

García, V. G. & Bartolomé, M. M. (**2010**): Rural Electrification Systems based on Renewable Energy: The Social Dimensions of an Innovative Technology. *Technology in Society*, 32 (4), pp. 303–311.

Gardien, P. & Gilsing, F. (**2013**): Walking the Walk: Putting Design at the Heart of Business. *Design Management Review*, 24 (2), pp. 54–66.

Garud, R.; Jain, S. & Tuertscher, P. (**2008**): Incomplete by Design and Designing for Incompleteness. *Organization Studies*, 29 (3), pp. 351–371.

Garud, R. & Karnøe, P. (**2003**): Bricolage versus Breakthrough: Distributed and Embedded Agency in Technology Entrepreneurship. *Research Policy*, 32 (2), pp. 277–300.

Gawer, A. (**2009**): Platforms, Markets and Innovation: An Introduction. In: Gawer, Annabelle: *Platforms, Markets and Innovation*. Cheltenham, U.K, Northampton, Mass. Edward Elgar, pp. 1–16.

Gawer, A. & Cusumano, M. A. (**2014**): Industry Platforms and Ecosystem Innovation. *Journal of Product Innovation Management*, 31 (3), pp. 417–433.

George, G.; Corbishley, C.; Khayesi, J. N. O.; Haas, M. R. & Tihanyi, L. (**2016**): Bringing Africa In: Promising Directions for Management Research. *Academy of Management Journal*, 59 (2), pp. 377–393.

George, G.; McGahan, A. M. & Prabhu, J. (**2012**): Innovation for Inclusive Growth: Towards a Theoretical Framework and a Research Agenda. *Journal of Management Studies*, 49 (4), pp. 661–683.

Gephart, R. P. (**2004**): Qualitative Research and the Academy of Management Journal. *Academy of Management Journal*, 47 (4), pp. 454–462.

Gibbert, M.; Hoegl, M. & Välikangas, L. (**2007**): In Praise of Resource Constraints. *MIT Sloan Management Review*, 48 (3), pp. 15–17.

Gibbert, M.; Ruigrok, W. & Wicki, B. (**2008**): What Passes as a Rigorous Case Study? *Strategic Management Journal*, 29 (13), pp. 1465–1474.

Gibson, W. J. & Brown, A. J. (**2009**): Working with Qualitative Data, London, Thousand Oaks, Calif: SAGE.

Gioia, D. A.; Corley, K. G. & Hamilton, A. L. (**2013**): Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods*, 16 (1), pp. 15–31.

Girtler, R. (**1984**): Methoden der qualitativen Sozialforschung: Anleitung zur Feldarbeit, Wien, Köln, Graz: Böhlau.

Glaeser, E. L. (**2012**): Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier, New York, NY: Penguin Books.

Glaser, B. G. (**1978**): Theoretical Sensitivity: Advances in the Methodology of Grounded Theory, Mill Valley: Sociology Press.

Glaser, B. G. & Strauss, A. L. (**1967**): The Discovery of Grounded Theory: Strategies for Qualitative Research, New York: Aldine de Gruyter.

Glaser, B. G. & Strauss, A. L. (**2009**): The Discovery of Grounded Theory: Strategies for Qualitative Research. 4, New Brunswick: Aldine.

Goduscheit, R. C. & Faullant, R. (**2018**): Paths Toward Radical Service Innovation in Manufacturing Companies: A Service-dominant Logic Perspective. *Journal of Product Innovation Management*, 35 (5), pp. 701–719.

Gold, S.; Hahn, R. & Seuring, S. (**2013**): Sustainable Supply Chain Management in "Base of the Pyramid" Food Projects: A Path to Triple Bottom Line Approaches for Multinationals? *International Business Review*, 22 (5), pp. 784–799.

Goldstein, S. M.; Johnston, R.; Duffy, J. & Rao, J. (**2002**): The Service Concept: The Missing Link in Service Design Research. *Journal of Operations Management*, 20 (2), pp. 121–134.

Gopalakrishnan, S. & Damanpour, F. (**1997**): A Review of Innovation Research in Economics, Sociology and Technology Management, 25 (1), pp. 15–28.

Gorham, R.; Eijbergen, B. L. J. & Kumar, A. (**2017**): Urban Transport: Lagos Shows Africa the Way Forward (Again). World Bank. URL: https://blogs.worldbank.org/transport/urban-transport-lagos-shows-africa-way-forward-again [14.06.2020].

Govindarajan, V. & Kopalle, P. K. (**2006**): The Usefulness of Measuring Disruptiveness of Innovations Ex Post in Making Ex Ante Predictions. *Journal of Product Innovation Management*, 23 (1), pp. 12–18.

Graham, F. (**2010**): M-Pesa: Kenya's Mobile Wallet Revolution. BBC News. URL: https://www.bbc.com/news/business-11793290 [01.3.2020].

Grix, J. (**2004**): The Foundations of Research, New York, NY: Palgrave Macmillan.

Grönroos, C. (**2008**): Service Logic Revisited: Who Creates Value? And Who Co-creates? *European Business Review*, 20 (4), pp. 298–314.

Gruber, M.; de Leon, N.; George, G. & Thompson, P. (**2015**): Managing by Design. *Academy of Management Journal*, 58 (1), pp. 1–7.

GSMA (**2017**): The Mobile Economy Sub-Saharan Africa 2017. GSM Association, London.

GSMA (**2018**): The Mobile Economy Sub-Saharan Africa 2018. GSM Association, London.

GSMA (**2019**): The Mobile Economy Sub-Saharan Africa 2019. GSM Association, London.

Guba, E. G. & Lincoln, Y. S. (**1994**): Competing Paradigms in Qualitative Research. In: Denzin, N. K.; Lincoln, Yvonna S.: *Handbook of Qualitative Research*. Sage Publications, Inc., pp. 105–117.

Gupta, A. K. (**2012**): Innovations for the Poor by the Poor. *International Journal of Technological Learning, Innovation and Development*, 5 (1/2), pp. 28–39.

Gupta, A. K. (**2013a**): Tapping the Entrepreneurial Potential of Grassroots Innovation. *Stanford Social Innovation Review*, 11 (3), pp. 18–20.

Gupta, K. L. (**2013b**): Finance and Economic Growth in Developing Countries, London: Routledge.

Gustafsson, A. & Johnson, M. D. (**2003**): Competing in a Service Economy: How to Create a Competitive Advantage Through Service Development and Innovation, San Francisco: Jossey-Bass.

Hamel, G. & Getz, G. (**2004**): Funding Growth in an Age of Austerity. *Harvard Business Review*, 82 (7/8), pp. 76–84.

Hart, S. L. & Christensen, C. M. (**2002**): The Great Leap: Driving Innovation from the Base of the Pyramid. *MIT Sloan Management Review*, 44 (1), pp. 51–56.

Harvey, J. S., **Jr.** (**2002**): The Trust Paradox: A Survey of Economic Inquiries into the Nature of Trust and Trustworthiness. *Journal of Economic Behavior & Organization*, 47 (3), pp. 291–307.

Hatchuel, A. (**2001**): Towards Design Theory and Expandable Rationality: The Unfinished Program of Herbert Simon. *Journal of Management & Governance*, 5 (3-4), pp. 260–273.

Heeks, R. (**2012**): Emerging Markets: IT Innovation for the Bottom of the Pyramid. *Communications of the ACM*, 55 (12), pp. 24–27.

Helfat, C. E. & Raubitschek, R. S. (**2018**): Dynamic and Integrative Capabilities for Profiting from Innovation in Digital Platform-based Ecosystems. *Research Policy*, 47 (8), pp. 1391–1399.

Hernández, R. J.; Cooper, R.; Tether, B. & Murphy, E. (**2018**): Design, the Language of Innovation: A Review of the Design Studies Literature. *She Ji: The Journal of Design, Economics, and Innovation*, 4 (3), pp. 249–274.

Hewitt-Dundas, N. (**2006**): Resource and Capability Constraints to Innovation in Small and Large Plants. *Small Business Economics*, 26 (3), pp. 257–277.

Hill, C. A. & O'Hara, E. A. (**2006**): A Cognitive Theory of Trust. *Washington University Law Review*, 84, pp. 1717–1796.

Hitt, M. A.; Tihanyi, L.; Miller, T. & Connelly, B. (**2006**): International Diversification: Antecedents, Outcomes, and Moderators. *Journal of Management*, 32 (6), pp. 831–867.

Hoskisson, R. E.; Wright, M.; Filatotchev, I. & Peng, M. W. (**2013**): Emerging Multinationals from Mid-range Economies: The Influence of Institutions and Factor Markets. *Journal of Management Studies*, 50 (7), pp. 1295–1321.

Hsieh, J. J. P.-A.; Rai, A. & Keil, M. (**2008**): Understanding Digital Inequality: Comparing Continued Use Behavioral Models of the Socio-economically Advantaged and Disadvantaged. *MIS Quarterly*, 32 (1), p. 97.

Huber, G. P. & Power, D. J. (**1985**): Retrospective Reports on Strategic-Level Managers: Guidelines for Increasing Their Accuracy. *Strategic Management Journal*, 6 (2), pp. 171–180.

IFC (**2016**): The First Six Decades: Leading the Way in Private Sector Development. International Finance Corporation.

ILO (**2014**): Green Jobs Assessment: Mauritius. International Labour Organisation, Geneva.

IMF (**2019**): World Economic Outlook: Growth Slowdown, Precarious Recovery. International Monetary Fund.

Immelt, J. R.; Govindarajan, V. & Trimble, C. (**2009**): How GE is Disrupting Itself. *Harvard Business Review*, 87 (10), pp. 56–65.

Ingram, P. & Silverman, B. S. (**2002**): Introduction: The New Institutionalism in Strategic Management. In: Ingram, Paul: *The New Institutionalism in Strategic Management*. Amsterdam. JAI Imprint, pp. 1–30.

International Organization of Standardization (ISO): Ergonomics of Human-system Interaction. URL: https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en [07.12.2019].

International Organization of Standardization (ISO): ISO/IEC 9126-1:2001: Software Engineering - Product Quality - Part 1: Quality Model. URL: https://www.iso.org/standard/22749.html [07.12.2019].

Ivatury, G.; Moore, J. & Bloch, A. (**2009**): A Doctor in Your Pocket: Health Hotlines in Developing Countries. *Innovations: Technology, Governance, Globalization*, 4 (1), pp. 119–153.

Jick, T. D. (**1979**): Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly*, 24 (4), pp. 602–611.

Johnson, S. P.; Menor, L. J.; Roth, A. V. & Chase, R. B. (**2000**): A Critical Evaluation of the New Service Development Process: Integrating Service Innovation and Service Design. In: Fitzsimmons, James A.; Fitzsimmons, Mona J.: *New Service Development: Creating Memorable Experiences*. Thousand Oaks, Calif. Sage Publications, pp. 1–32.

Julian, S. D. & Ofori-Dankwa, J. C. (**2013**): Financial Resource Availability and Corporate Social Responsibility Expenditures in a Sub-Saharan Economy: The Institutional Difference Hypothesis. *Strategic Management Journal*, 34 (11), pp. 1314–1330.

Kallinikos, J.; Aaltonen, A. & Marton, A. (**2013**): The Ambivalent Ontology of Digital Artifacts. *MIS Quarterly*, 37 (2), pp. 357–370.

Kamoche, K. & Harvey, M. (**2006**): Knowledge Diffusion in the African Context: An Institutional Theory Perspective. *Thunderbird International Business Review*, 48 (2), pp. 157–181.

Kandachar, P. & Halme, M. (**2007**): An Exploratory Journey towards the Research and Practice of the 'Base of the Pyramid'. *Greener Management International* (51), pp. 3–17.

Karhu, P. (**2007**): Emerging Mobile Service Innovation Markets: The Case of the Finnish Mobile TV Service Market.

Karnani, A. (**2007**): The Mirage of Marketing to the Bottom of the Pyramid: How the Private Sector Can Help Alleviate Poverty. *California Management Review*, 49 (4), pp. 90–111.

Karpen, I. O.; Gemser, G. & Calabretta, G. (**2017**): A Multilevel Consideration of Service Design Conditions: Towards a Portfolio of Organisational Capabilities, Interactive Practices and Individual Abilities. *Journal of Service Theory and Practice*, 27 (2), pp. 384–407.

Katz, J. (**1983**): A Theory of Qualitative Methodology: The Social System of Analytical Fieldwork. In: Emerson, Robert M.: *Contemporary Field Research*. Boston. Little Brown, pp. 127–148.

Kayser, O. & Budinich, V. (**2015**): Scaling up Business Solutions to Social Problems: A Practical Guide for Social and Corporate Entrepreneurs, London: Palgrave Macmillan UK.

Kehl, J. R. (**2007**): Emerging Markets in Africa. *African Journal of Political Science and International Relations*, 1 (1), pp. 1–8.

Keupp, M. M. & Gassmann, O. (**2013**): Resource Constraints as Triggers of Radical Innovation: Longitudinal Evidence from The Manufacturing Sector. *Research Policy*, 42 (8), pp. 1457–1468.

Khanna, T. (**2018**): Trust: Creating the Foundation for Entrepreneurship in Developing Countries, Oakland, CA: BK Berrett-Koehler Publishers Inc.

Khanna, T. & Palepu, K. (**2000**): The Future of Business Groups in Emerging Markets: Long-run Evidence from Chile. *Academy of Management Journal*, 43 (3), pp. 268–285.

Khanna, T. & Palepu, K. G. (**1997**): Why Focused Strategies May Be Wrong for Emerging Markets. *Harvard Business Review*, 75 (4), pp. 41–54.

Khanna, T. & Palepu, K. G. (**2010**): Winning in Emerging Markets: A Road Map for Strategy and Execution, Boston: Harvard Business Review Press.

Khanna, T.; Palepu, K. G. & Sinha, J. (**2005**): Strategies That Fit Emerging Markets. *Harvard Business Review*, 83 (6), pp. 4–19.

Khanna, T. & Rivkin, J. W. (**2001**): Estimating the Performance Effects of Business Groups in Emerging Markets. *Strategic Management Journal*, 22 (1), pp. 45–74.

Khanna, T. & Rivkin, J. W. (**2006**): Interorganizational Ties and Business Group Boundaries: Evidence from an Emerging Economy. *Organization Science*, 17 (3), pp. 333–352.

Khavul, S. & Bruton, G. D. (**2013**): Harnessing Innovation for Change: Sustainability and Poverty in Developing Countries. *Journal of Management Studies*, 50 (2), pp. 285–306.

Kim, D.-J. & Kogut, B. (**1996**): Technological Platforms and Diversification. *Organization Science*, 7 (3), pp. 283–301.

Kimbell, L. (**2011a**): Designing for Service as One Way of Designing Services. *International Journal of Design*, 5 (2), pp. 41–52.

Kimbell, L. (**2011b**): Rethinking Design Thinking: Part I. *Design and Culture*, 3 (3), pp. 285–306.

Kirk, J. & Miller, M. L. (**1986**): Reliability and Validity in Qualitative Research, Beverly Hills: Sage Publications.

Kistruck, G. M.; Lount, R. B.; Smith, B. R.; Bergman, B. J. & Moss, T. W. (**2016**): Cooperation vs. Competition: Alternative Goal Structures for Motivating Groups in a Resource Scarce Environment. *Academy of Management Journal*, 59 (4), pp. 1174–1198.

Kistruck, G. M.; Sutter, C. J.; Lount, R. B. & Smith, B. R. (**2013**): Mitigating Principal-agent Problems in Base-of-the-pyramid Markets: An Identity Spillover Perspective. *Academy of Management Journal*, 56 (3), pp. 659–682.

Knack, S. (**2001**): Trust, Associational Life and Economic Performance. *The Contribution of Investment in Human and Social Capital to Sustained Economic Growth and Well-being*, pp. 172–202.

Kogut, B. & Zander, U. (**1992**): Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. *Organization Science*, 3 (3), pp. 383–397.

Kolk, A.; Rivera-Santos, M. & Rufin, C. (**2014**): Reviewing a Decade of Research on the "Base/Bottom of the Pyramid" (BOP) Concept. *Business & Society*, 53 (3), pp. 338–377.

Krug, B. & Hendrischke, H. (**2012**): Market Design in Chinese Market Places. *Asia Pacific Journal of Management*, 29 (3), pp. 525–546.

Kuteesa, H. (**2019**): Navigating the New Tap & Go System Step by Step. The New Times. URL: https://www.newtimes.co.rw/news/featured-navigating-new-tap-go-system-step-step [14.03.2020].

Lagarde, C. (**2016**): The Role of Emerging Markets in a New Global Partnership for Growth, University of Maryland.

LAMATA (**2020**): Lagos Metropolitan Area Transport Authority [14.06.2020].

Langley, A. & Abdallah, C. (**2011**): Templates and Turns in Qualitative Studies of Strategy and Management. In: Bergh, Donald D.: *Building Methodological Bridges*. Bingley. Emerald, pp. 201–235.

Lawrence, T. B.; Hardy, C. & Phillips, N. (**2002**): Institutional Effects of Interorganizational Collaboration: The Emergence of Proto-institutions. *Academy of Management Journal*, 45 (1), pp. 281–290.

Lee, D.; Moon, J.; Kim, Y. J. & Yi, M. Y. (**2015**): Antecedents and Consequences of Mobile Phone Usability: Linking Simplicity and Interactivity to Satisfaction, Trust, and Brand Loyalty. *Information & Management*, 52 (3), pp. 295–304.

Lévi-Strauss, C. (**1966**): The Savage Mind, Chicago: University of Chicago Press.

Lincoln, Y. S. & Guba, E. G. (**1985**): Naturalistic Inquiry, Newbury Park, Calif.: SAGE.

Lindblom, C. E. (**1959**): The Science of "Muddling Through". *Public Administration Review*, 19 (2), p. 79.

Linna, P. (**2013**): Bricolage as a Means of Innovating in a Resource-scarce Environment: A Study of Innovator-entrepreneurs at the BoP. *Journal Of Developmental Entrepreneurship*, 18 (3), pp. 1–23.

London, T.; Anupindi, R. & Sheth, S. (**2010**): Creating Mutual Value: Lessons Learned from Ventures Serving Base of the Pyramid Producers. *Journal of Business Research*, 63 (6), pp. 582–594.

London, T. & Hart, S. L. (**2004**): Reinventing Strategies for Emerging Markets: Beyond the Transnational Model. *Journal of International Business Studies*, 35 (5), pp. 350–370.

Lounsbury, M. & Crumley, E. T. (**2007**): New Practice Creation: An Institutional Perspective on Innovation. *Organization Studies*, 28 (7), pp. 993–1012.

Lucas, K. (**2011**): Making the Connections Between Transport Disadvantage and the Social Exclusion of Low Income Populations in the Tshwane Region of South Africa. *Journal of Transport Geography*, 19 (6), pp. 1320–1334.

Luhmann, N. (**1988**): Familiarity, Confidence, Trust: Problems and Alternatives. In: Gambetta, Diego: *Trust: Making and Breaking Cooperative Relations*. Oxford, UK. Basil Blackwell, pp. 94–107.

Lundvall, B.-A. (**2013**): An Agenda for Future Research. In: Fagerberg, Jan; Martin, Ben R.; Andersen, E. S.: *Innovation Studies Evolution and Future Challenges*. Oxford (UK). Oxford University Press, pp. 202–209.

Lusch, R. F. & Nambisan, S. (**2015**): Service Innovation: A Service-dominant Logic Perspective. *MIS Quarterly*, 39 (1), pp. 155–175.

MacCormack, A. & Verganti, R. (**2003**): Managing the Sources of Uncertainty: Matching Process and Context in Software Development. *Journal of Product Innovation Management*, 20 (3), pp. 217–232.

MacCormack, A.; Verganti, R. & Iansiti, M. (**2001**): Developing Products on “Internet Time”: The Anatomy of a Flexible Development Process. *Management Science*, 47 (1), pp. 133–150.

Mair, J. & Martí, I. (**2009**): Entrepreneurship in and around Institutional Voids: A Case Study from Bangladesh. *Journal of Business Venturing*, 24 (5), pp. 419–435.

Mair, J.; Martí, I. & Ventresca, M. J. (**2012**): Building Inclusive Markets in Rural Bangladesh: How Intermediaries Work Institutional Voids. *Academy of Management Journal*, 55 (4), pp. 819–850.

Mair, J. & Schoen, O. (**2007**): Successful Social Entrepreneurial Business Models in the Context of Developing Economies. *International Journal of Emerging Markets*, 2 (1), pp. 54–68.

Manzini, E. (**2011**): Introduction. In: Meroni, Anna; Sangiorgi, Daniela: *Design for Services*. Abingdon, Oxon. Routledge, pp. 1–6.

Marquis, C. & Raynard, M. (**2015**): Institutional Strategies in Emerging Markets. *The Academy of Management Annals*, 9 (1), pp. 291–335.

Martin, B. R. (**2013**): Innovation Studies: An Emerging Agenda. In: Fagerberg, Jan; Mowery, David C.; Nelson, Richard R.: *The Oxford Handbook of Innovation*. Oxford. Oxford University Press, pp. 168–186.

Martin, B. R. (**2016**): Twenty Challenges for Innovation Studies. *Science and Public Policy*, 43 (3), pp. 432–450.

Massa, L. & Tucci, C. L. (**2014**): Business Model Innovation. In: Dodgson, Mark; Gann, David M.; Phillips, Nelson: *The Oxford Handbook of Innovation Management*. Oxford. Oxford University Press, pp. 420–441.

McKinsey (**2012**): Africa at Work: Job Creation and Inclusive Growth. URL: https://www.mckinsey.com/featured-insights/middle-east-and-africa/africa-at-work [23.10.2020].

McKinsey (**2013**): Lions Go Digital: The Internet's Transformative Potential in Africa. McKinsey and Company.

McKnight, D. H. & Cummingsm, N. I. (**1998**): Initial Trust Formation in New Organizational Relationships. *The Academy of Management Review*, 23 (3), pp. 473–490.

Melton, H. & Hartline, M. D. (**2015**): Customer and Employee Co-creation of Radical Service Innovations. *Journal of Services Marketing*, 29 (2), pp. 112–123.

Menor, L. J.; Mohan, V. T. & Sampson, S. E. (**2002**): New Service Development: Areas for Exploration and Exploitation. *Journal of Operations Management*, 20 (2), pp. 135–157.

Merchant, H. (**2016**): Handbook of Contemporary Research on Emerging Markets, Cheltenham, UK: Edward Elgar Publishing.

Meroni, A. & Sangiorgi, D. (**2011**): Design for Services, Abingdon, Oxon: Routledge.

Michalopoulos, S. & Papaioannou, E. (**2015**): On the Ethnic Origins of African Development: Chiefs and Precolonial Political Centralization. *Academy of Management Perspectives*, 29 (1), pp. 32–71.

Miles, I. (**2008**): Patterns of Innovation in Service Industries. *IBM Systems Journal*, 47 (1), pp. 115–128.

Miles, M. B. & Huberman, A. M. (**1994**): Qualitative Data Analysis: An Expanded Sourcebook, Thousand Oaks, Calif.: Sage Publications.

Miles, M. B.; Huberman, A. M. & Saldaña, J. (**2014**): Qualitative Data Analysis: A Methods Sourcebook. 3, Los Angeles, London, New Delhi, Singapore, Washington DC: SAGE.

Mill, J. S. (**1891**): Principles of Political Economy, London: Longmans.

Miscione, G. (**2007**): Telemedicine in the Upper Amazon: Interplay with Local Health Care Practices. *MIS Quarterly*, 31 (2), p. 403.

Mo Ibrahim Foundation (**2019**): Agendas 2063 & 2030: Is Africa on Track? African Governance Report.

Moorman, C.; Zaltman, G. & Deshpandé, R. (**1992**): Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organizations. *Journal of Marketing Research*, 29 (3), pp. 314–328.

Morgan, G. (**1983**): Beyond Method: Strategies for Social Research, Beverly Hills, Calif.: SAGE.

Morgan, R. M. & Hunt, S. (**1994**): The Commitment-trust Theory of Relationship Marketing. *Journal of Marketing*, 58 (3), pp. 20–38.

MSCI (**2014**): Market Classification Framework. Morgan Stanley Capital International.

Mussachio, A. & Werker, E. (**2016**): Mapping Frontier Economies. *Harvard Business Review*, 95 (12), pp. 40–48.

Mwenda, K. (**2000**): Securities Regulation and Emerging Markets: Legal and Institutional Issues for Southern and Eastern Africa. *Murdoch University Journal of Law and World Bank*, 7 (1), pp. 1–20.

Nambisan, S. (**2017**): Digital Innovation Management: Reinventing Innovation Management Research in a Digital World. *MIS Quarterly*, 41 (1), pp. 223–238.

Nambisan, S. (**2018**): Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship. *Entrepreneurship Theory and Practice*, 41 (6), pp. 1029–1055.

Nambisan, S. & Sawhney, M. S. (**2007**): The Global Brain: Your Roadmap for Innovating Faster and Smarter in a Networked World, Upper Saddle River, NJ: Wharton School Publishing.

Neely, A. (**2008**): Exploring the Financial Consequences of the Servitization of Manufacturing. *Operations Management Research*, 1 (2), pp. 103–118.

Nellor, D. C. L. (**2008**): The Rise of Africa's "Frontier" Markets: A Number of Sub-Saharan Countries are Beginning to Attract Investors to their Financial Markets. *Finance and Development, IMF*, 45 (3), pp. 30–33.

Neumeier, M. (**2009**): The Designful Company: How to Build a Culture of Nonstop Innovation, Berkeley, California, London: New Riders; Pearson Education.

Nijssen, E. J.; Hillebrand, B.; Vermeulen, P. A. M. & Kemp, R. G. M. (**2006**): Exploring Product and Service Innovation Similarities and Differences. *International Journal of Research in Marketing*, 23 (3), pp. 241–251.

North, D. C. (**1990**): Institutions, Institutional Change and Economic Performance, Cambridge, U.K.: Cambridge University Press.

North, D. C. (**1991**): Institutions. *Journal of Economic Perspectives*, 5 (1), pp. 97–112.

North, D. C. (**1994**): Economic Performance Through Time. *The American Review*, 84 (3), pp. 359–368.

Nsengiyera, D.; Mohajan, B. & Musabyemariya, M. C. (**2018**): The Contribution of Public Transport Services to the Economic Development of Kigali City: A Case Study of Rwanda Federation Transport Cooperative (RFTC). *Journal of Economics and Trade*, 3 (2), pp. 98–106.

Nunn, N. & Wantchekon, L. (**2011**): The Slave Trade and the Origins of Mistrust in Africa. *American Economic Review*, 101 (7), pp. 3221–3252.

Ocasio, W. (**1997**): Towards an Attention-based View of the Firm. *Strategic Management Journal*, 18 (S1), pp. 187–206.

OECD (**1992**): The Measurement of Scientific and Technological Activities: Proposed Guidelines for Collecting and Interpreting Technological Innovation Data. OECD**;** Eurostat **&** European Commission. URL: https://www.oecd.org/science/inno/2367614.pdf [02.03.2018].

OECD (**1997**): Proposed Guidelines for Collecting and Interpreting Technological Innovation Data: Oslo Manual. OECD**;** Eurostat **&** European Union. URL: https://www.oecd-ilibrary.org/science-and-technology/proposed-guidelines-for-collecting-and-interpreting-technological-innovation-data_9789264192263-en.

OECD (**2005**): Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data. 3, Paris: OECD Publishing.

OECD & Eurostat (**2018**): Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation. 4, Paris: OECD Publishing.

Olsen, M. & Boxenbaum, E. (**2009**): Bottom-of-the-Pyramid: Organizational Barriers to Implementation. *California Management Review*, 51 (4), pp. 100–125.

Ombok, E. (**2019**): Traffic Jams in Kenya's Capital Bleed $1 Billion from Economy. Bloomberg. URL: https://www.bloomberg.com/news/articles/2019-09-24/traffic-jams-in-kenya-s-capital-bleed-1-billion-from-economy [24.11.2019].

Ordanini, A. & Parasuraman, A. (**2011**): Service Innovation Viewed Through a Service-dominant Logic Lens: A Conceptual Framework and Empirical Analysis. *Journal of Service Research*, 14 (1), pp. 3–23.

Orlikowski, W. J. (**2016**): Sociomaterial Practices: Exploring Technology at Work. *Organization Studies*, 28 (9), pp. 1435–1448.

Orlikowski, W. J. & Scott, S. V. (**2015**): The Algorithm and the Crowd: Considering the Materiality of Service Innovation. *MIS Quarterly*, 39 (1), pp. 1–33.

Osterwalder, A. & Pigneur, Y. (**2010**): Business Model Generation, New York: Wiley&Sons.

Pacek, N. & Thorniley, D. (**2007**): Emerging Markets: Lessons for Business Success and the Outlook for Different Markets. 2, London: Economist.

Pansera, M. & Owen, R. (**2018**): Framing Inclusive Innovation Within the Discourse of Development: Insights from Case Studies in India. *Research Policy*, 47 (1), pp. 23–34.

Pansera, M. & Sarkar, S. (**2016**): Crafting Sustainable Development Solutions: Frugal Innovations of Grassroots Entrepreneurs. *Sustainability*, 8 (1), pp. 1–25.

Pantzar, M. & Shove, E. (**2010**): Understanding Innovation in Practice: A Discussion of the Production and Re-production of Nordic Walking. *Technology Analysis & Strategic Management*, 22 (4), pp. 447–461.

Papaioannou, T. (**2014**): How Inclusive Can Innovation and Development Be in the Twenty-first Century? *Innovation and Development*, 4 (2), pp. 187–202.

Patton, M. Q. (**2002**): Qualitative Research & Evaluation Methods. 3, Thousand Oaks, Calif.: SAGE.

Pavlou, P. A. & El Sawy, O. A. (**2010**): The "Third Hand": IT-enabled Competitive Advantage in Turbulence Through Improvisational Capabilities. *Information Systems Research*, 21 (3), pp. 443–471.

Penrose, E. G. (**1959**): The Theory of the Growth of the Firm, New York: Wiley.

Peteraf, M. A. (**1993**): The Cornerstones of Competitive Advantage: A Resource-based View. *Strategic Management Journal*, 14 (3), pp. 179–191.

Popadiuk, S. & Choo, C. W. (**2006**): Innovation and Knowledge Creation: How are these Concepts Related? *International Journal of Information Management*, 26 (4), pp. 302–312.

Popper, K. (**2014**): Conjectures and Refutations: The Growth of Scientific Knowledge, Hoboken: Taylor and Francis.

Prahalad, C. K. (**2005**): The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits, Upper Saddle River, NJ: Wharton School Publishing.

Prahalad, C. K. (**2010**): The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits. Revised Edition, Upper Saddle River, N.J.: Wharton School Publishing.

Prahalad, C. K. (**2012**): Bottom of the Pyramid as a Source of Breakthrough Innovations. *Journal of Product Innovation Management*, 29 (1), pp. 6–12.

Prahalad, C. K. & Hammond, A. (**2002**): Serving the World's Poor, profitably. *Harvard Business Review*, 80 (9), pp. 48–57.

Prahalad, C. K. & Mashelkar, R. A. (**2010**): Innovation's Holy Grail. *Harvard Business Review*, 88 (7-8), pp. 132–141.

Prahalad, C. K. & Ramaswamy, V. (**2004a**): Co-creation Experiences: The Next Practice in Value Creation. *Journal of Interactive Marketing*, 18 (3), pp. 5–14.

Prahalad, C. K. & Ramaswamy, V. (**2004b**): The Future of Competition: Co-creating Value with Customers, Boston: Harvard Business School Press.

Punchoojit, L. & Hongwarittorrn, N. (**2017**): Usability Studies on Mobile User Interface Design Patterns: A Systematic Literature Review. *Advances in Human-Computer Interaction*, 2017 (16), pp. 1–22.

Puri, M.; Tavoletti, E. & Cerruti, C. (**2015**): Resource Constrained Innovation at the Base of the Pyramid: Towards a Theoretical Framework. *International Business: Research, Teaching and Practice*.

Radjou, N.; Prabhu, J. C. & Ahuja, S. (**2012**): Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth, San Francisco, CA: Jossey-Bass.

Rao, B. C. (**2013**): How Disruptive is Frugal? *Technology in Society*, 35 (1), pp. 65–73.

Ray, S. & Ray, P. K. (**2011**): Product Innovation for the People's Car in an Emerging Economy. *Technovation*, 31 (5-6), pp. 216–227.

Reckwitz, A. (**2002**): Toward a Theory of Social Practices: A Development in Culturalist Theorizing. *European Journal of Social Theory*, 5 (2), pp. 243–263.

Rehman, A. A. & Alharthi, K. (**2016**): An Introduction to Research Paradigms. *International Journal of Educational Investigations* (8), pp. 51–59.

Richards, K. (**2003**): Qualitative Inquiry in TESOL, New York, NY: Palgrave Macmillan.

Rittel, H. & Webber, M. (**1973**): Dilemmas in a General Theory of Planning. *Policy Sciences*, 4 (2), pp. 155–169.

Rivera-Santos, M.; Holt, D.; Littlewood, D. & Kolk, A. (**2015**): Social Entrepreneurship in Sub-Saharan Africa. *Academy of Management Perspectives*, 29 (1), pp. 72–91.

Robinson, B. (**2019**): Nairobi, Kenya: Accelerating Change in the Transport Sector. Transformative Urban Mobility Initiative. URL: https://www.transformative-mobility.org/publications/nairobi-kenya-accelerating-change-in-the-transport-sector [14.06.2020].

Rogers, E. M. (**2003**): Diffusion of Innovations. 5, New York: Free Press.

Rosenberg, T. (**2013**): A Hospital Network with a Vision. New York Times. URL: https://opinionator.blogs.nytimes.com/2013/01/16/in-india-leading-a-hospital-franchise-with-vision/ [02.07.2019].

Ross, J. W.; Sebastian, I.; Beath, C.; Mocker, M.; Moloney, K. & Fonstad, N. (**2016**): Designing and Executing Digital Strategies. *Thirty Seventh International Conference on Information Systems*, Dublin.

Roth, A. (**2015**): On the Way to a Systematic Service Innovation Competence Framework. In: Agarwal, Renu; Selen, Willem; Roos, Göran; Green, Roy: *The Handbook of Service Innovation*. London. Springer, pp. 127–144.

Rotter, J. B. (**1967**): A New Scale for the Measurement of Interpersonal Trust. *Journal of Personality*, 35 (4), 651-665.

Rousseau, D. M.; Sitkin, S. B.; Burt, R. S. & Camerer, C. (**1998**): Not So Different After All: A Cross-discipline View of Trust. *The Academy of Management Review*, 23 (3), pp. 393–404.

Saldaña, J. (**2016**): The Coding Manual for Qualitative Researchers. 3, Los Angeles: SAGE.

Salon, D. & Gulyani, S. (**2010**): Mobility, Poverty, and Gender: Travel 'Choices' of Slum Residents in Nairobi, Kenya. *Transport Reviews*, 30 (5), pp. 641–657.

Salter, A. & Alexy, O. (**2014**): The Nature of Innovation. In: Dodgson, Mark; Gann, David M.; Phillips, Nelson: *The Oxford Handbook of Innovation Management*. Oxford. Oxford University Press, pp. 26–45.

Sanchez, R.; Heene, A. & Thomas, H. (**1996**): Introduction: Towards the Theory and Practice of Competence-based Competition. In: Sanchez, Ron; Heene, Aime; Thomas, Howard: *Dynamics of Competence-based Competition: Theory and Practice in the New Strategic Management*, pp. 1–35.

Sánchez, P. & Ricart, J. E. (**2010**): Business Model Innovation and Sources of Value Creation in Low-income Markets. *European Management Review*, 7 (3), pp. 138–154.

Sarasvathy, S. D. (**2001**): Causation and Effectuation: Toward a Theoretical Shift from Economic Inevitability to Entrepreneurial Contingency. *Academy of Management Review*, 26 (2), pp. 243–263.

Sarasvathy, S. D. (**2003**): Entrepreneurship as a Science of the Artificial. *Journal of Economic Psychology*, 24 (2), pp. 203–220.

Sarasvathy, S. D. (**2009**): Effectuation: Elements of Entrepreneurial Expertise, Cheltenham: Edward Elgar.

Sawhney, M.; Wolcott, R. C. & Arroniz, I. (**2006**): The 12 Different Ways for Companies to Innovate. *MIT Sloan Management Review*, 47 (3), pp. 75–81.

Schumpeter, J. A. (**1928**): The Instability of Capitalism. *Economic Journal*, 38, pp. 361–386.

Schumpeter, J. A. (**1934**): The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle, Cambridge, MA: Harvard University Press.

Schumpeter, J. A. (**1942**): Capitalism, Socialism and Democracy, New York: Harper.

Scott, W. R. (**1995**): Institutions and Organizations, Thousand Oaks, CA: SAGE.

Scott, W. R.; Ruef, M.; Mendel, P. J. & Caronna, C. A. (**2000**): Institutional Change and Healthcare Organizations: From Professional Dominance to Managed Care, Chicago: University of Chicago Press.

Seelos, C. & Mair, J. (**2007**): Profitable Business Models and Market Creation in the Context of Deep Poverty: A Strategic View. *Academy of Management Perspectives*, 21 (4), pp. 49–63.

Sen, A. (**2013**): Development as Capability Expansion. In: de Filippis, James; Saegert, Susan: *Community Development Reader*. Hoboken. Taylor and Francis, pp. 319–327.

Shafer, S. M.; Smith, H. J. & Linder, J. C. (**2005**): The Power of Business Models. *Business Horizons*, 48 (3), pp. 199–207.

Shah, S. (**2011**): The Fever: How Malaria has Ruled Humankind for 500,000 Years, New York: Picador.

Shapiro, S. P. (**1987**): The Social Control of Impersonal Trust. *American Journal of Sociology*, 93 (3), pp. 623–658.

Sharma, A. & Iyer, G. R. (**2012**): Resource-constrained Product Development: Implications for Green Marketing and Green Supply Chains. *Industrial Marketing Management*, 41 (4), pp. 599–608.

Sherman, S. (**1992**): Are Strategic Alliances Working? *Fortune* (September), pp. 77–78.

Shove, E. & Pantzar, M. (**2005**): Consumers, Producers and Practices: Understanding the Invention and Reinvention of Nordic Walking. *Journal of Consumer Culture*, 5 (1), pp. 43–64.

Siggelkow, N. (**2007**): Persuasion with Case Studies. *Academy of Management Journal*, 50 (1), pp. 20–24.

Simanis, E.; Hart, S. & Duke, D. (**2008**): The Base of the Pyramid Protocol: Beyond "Basic Needs" Business Strategies. *Innovations: Technology, Governance, Globalization*, 3 (1), pp. 57–84.

Simon, H. A. (**1969**): The Sciences of the Artificial, Cambridge, MA: MIT Press.

Sinha, R. (**2013**): Reverse Innovation: A Gift from Developing Economy to Developed Economy. *Business Perspectives and Research*, 2 (1), pp. 69–78.

Sirmon, D. G.; Gove, S. & Hitt, M. A. (**2008**): Resource Management in Dyadic Competitive Rivalry: The Effects of Resource Bundling and Deployment. *Academy of Management Journal*, 51 (5), pp. 919–935.

Sirmon, D. G. & Hitt, M. A. (**2003**): Managing Resources: Linking Unique Resources, Management and Wealth Creation in Family Firms. *Entrepreneurship Theory and Practice*, 27 (4), pp. 339–358.

Sit, V. F. S. & Liu, W. (**2000**): Restructuring and Spatial Change of China's Auto Industry under Institutional Reform and Globalization. *Annals of the Association of American Geographers*, 90 (4), pp. 653–673.

Sivaprakasam, S. & Srinivasan, R. (**2015**): Frugal Services Innovation—Lessons from the Emerging Markets and an Adoption Framework for First-World Corporations and Governments. In: Agarwal, Renu; Selen, Willem; Roos, Göran; Green, Roy: *The Handbook of Service Innovation*. London. Springer, pp. 683–702.

Skålén, P.; Gummerus, J.; Koskull, C. von & Magnusson, P. R. (**2015**): Exploring Value Propositions and Service Innovation: A Service-dominant Logic Study. *Journal of the Academy of Marketing Science*, 43 (2), pp. 137–158.

Smith, A. (**1904**): An Inquiry into the Nature and Causes of the Wealth of Nations (1776), London: Methuen.

Smith, W. K. (**2014**): Dynamic Decision Making: A Model of Senior Leaders Managing Strategic Paradoxes. *Academy of Management Journal*, 57 (6), pp. 1592–1623.

Srinivas, S. & Sutz, J. (**2008**): Developing Countries and Innovation: Searching for a New Analytical Approach. *Technology in Society*, 30 (2), pp. 129–140.

Srivastava, S. C. & Shainesh, G. (**2015**): Bridging the Service Divide Through Digitally Enabled Service Innovation: Evidence from Indian Healthcare Service Providers. *MIS Quarterly*, 39 (1), pp. 245–267.

Statista (**2020a**): Biggest App Stores in the World 2020. URL: https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/ [28.11.2020].

Statista (**2020b**): Number of Internet Users in Selected Countries in Africa as of June 2019, by Country (in millions). URL: https://www.statista.com/statistics/505883/number-of-internet-users-in-african-countries/ [17.07.2020].

Steinke, I. (**2004**): Quality Criteria in Qualitative Research. In: Flick, Uwe; Kardorff, Ernst von; Steinke, Ines: *A Companion to Qualitative Research*. London. SAGE, pp. 184–190.

Stevens, E. & Dimitriadis, S. (**2005**): Managing the New Service Development Process: Towards a Systemic Model. *European Journal of Marketing*, 39 (1/2), pp. 175–198.

Storey, C.; Cankurtaran, P.; Papastathopoulou, P. & Hultink, E. J. (**2016**): Success Factors for Service Innovation: A Meta-Analysis. *Journal of Product Innovation Management*, 33 (5), pp. 527–548.

Strauss, A. & Corbin, J. (**1994**): Grounded Theory Methodology: An Overview. In: Denzin, N. K.; Lincoln, Yvonna S.: *Handbook of Qualitative Research*. Sage Publications, Inc., pp. 273–285.

Strauss, A. L. & Corbin, J. (**1998**): Basics of Qualitative Research. 2, Thousand Oaks: Sage Publ.

Strike, V. M. & Rerup, C. (**2016**): Mediated Sensemaking. *Academy of Management Journal*, 59 (3), pp. 880–905.

Sundbo, J. (**1997**): Management of Innovation in Services. *The Service Industries Journal*, 17 (3), pp. 432–455.

Tarozzi, A.; Mahajan, A.; Blackburn, B.; Kopf, D.; Krishnan, L. & Yoong, J. (**2014**): Micro-loans, Insecticide-treated Bednets, and Malaria: Evidence from a Randomized Controlled Trial in Orissa, India. *American Economic Review*, 104 (7), pp. 1909–1941.

Teece, D. J. (**2007**): Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. *Strategic Management Journal*, 28 (13), pp. 1319–1350.

Teece, D. J. (**2010**): Business Models, Business Strategy and Innovation. *Long Range Planning*, 43 (2-3), pp. 172–194.

Teece, D. J. (**2018**): Profiting from Innovation in the Digital Economy: Standards, Complementary Assets, and Business Models in the Wireless World. *Resources Policy*, 47 (8), pp. 1367–1387.

Teece, D. J.; Pisano, G. & Shuen, A. (**1997**): Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18 (7), pp. 509–533.

The Economist (**1999**): Industry Gets Religion. URL: https://www.economist.com/special-report/1999/02/18/industry-gets-religion [21.09.2020].

The Economist (**2010**): First Break All the Rules: Special Report on Innovation in Emerging Markets. URL: https://www.economist.com/special-report/2010/04/17/first-break-all-the-rules [01.11.2019].

The Economist (**2011**): The Hopeful Continent: Africa Rising. URL: https://www.economist.com/leaders/2011/12/03/africa-rising.

The Economist (**2015**): Road Deaths in Africa: Worse than Malaria. URL: https://www.economist.com/middle-east-and-africa/2015/10/24/worse-than-malaria [24.11.2019].

The Economist (**2019**): What is Sub-Saharan Africa? URL: https://www.economist.com/the-economist-explains/2019/03/07/what-is-sub-saharan-africa [17.09.2020].

Thomas, L. D. W.; Autio, E. & Gann, D. M. (**2014**): Architectural Leverage: Putting Platforms in Context. *Academy of Management Perspectives*, 28 (2), pp. 198–219.

Tilson, D.; Lyytinen, K. & Sørensen, C. (**2010**): Research Commentary: Digital Infrastructures: The Missing IS Research Agenda. *Information Systems Research*, 21 (4), pp. 748–759.

Tiwana, A.; Konsynski, B. & Bush, A. A. (**2010**): Research Commentary: Platform Evolution: Coevolution of Platform Architecture, Governance, and Environmental Dynamics. *Information Systems Research*, 21 (4), pp. 675–687.

Toivonen, M. & Tuominen, T. (**2009**): Emergence of Innovations in Services. *The Service Industries Journal*, 29 (7), pp. 887–902.

Tongur, S. & Engwall, M. (**2014**): The Business Model Dilemma of Technology Shifts. *Technovation*, 34 (9), pp. 525–535.

Torri, M.-C. (**2010**): Community-based Enterprises: A Promising Basis towards an Alternative Entrepreneurial Model for Sustainability Enhancing Livelihoods and Promoting Socio-economic Development in Rural India. *Journal of Small Business & Entrepreneurship*, 23 (2), pp. 237–248.

Troilo, G.; de Luca, L. M. & Guenzi, P. (**2017**): Linking Data-rich Environments with Service Innovation in Incumbent Firms: A Conceptual Framework and Research Propositions. *Journal of Product Innovation Management*, 34 (5), pp. 617–639.

UNDP (**2019a**): Human Development Index (HDI). URL: http://hdr.undp.org/en/content/human-development-index-hdi [17.09.2020].

UNDP (**2019b**): Human Development Report 2019: Beyond Income, Beyond Averages, Beyond Today, New York: BERNAN Press.

UNDP (**2020**): About Sub-Saharan Africa: Africa at a Turning Point. URL: https://www.africa.undp.org/content/rba/en/home/regioninfo.html [17.09.2020].

UNECA (**2016**): The Demographic Profile of African Countries. Economic Commission for Africa, Addis Ababa, Ethiopia.

Urban Pathways (**2020**): Rwanda – Kigali. URL: https://www.urban-pathways.org/kigali.html [14.10.2020].

van Agtmael, A. W. (**2007**): The Emerging Markets Century: How a New Breed of World-class Companies is Overtaking the World, New York: Simon and Schuster.

van de Ven, A. H. (**1986**): Central Problems in the Management of Innovation. *Management Science*, 32 (5), pp. 590–607.

van Maanen, J. (**1983**): Qualitative Methods Reclaimed. Alfred P. Sloan School of Management, Cambridge, MA.

Varadarajan, R. (**2011**): Conjectures on Innovation Drivers in an Emerging Market: India. In: Jain, Subhash C.; Griffith, David A.: *Handbook of Research in International Marketing*. Cheltenham, U.K. Edward Elgar Publishing, pp. 117–134.

Vargo, S. L. & Lusch, R. F. (**2004**): Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68 (1), pp. 1–17.

Vargo, S. L. & Lusch, R. F. (**2006**): Service-dominant Logic: What it is, What it is not, What it might be. In: Lusch, R. F.; Vargo, S. L.: *The Service-dominant Logic of Marketing: Dialog, Debate, and Directions*. Armonk, NY. ME Sharpe, pp. 43–56.

Vargo, S. L. & Lusch, R. F. (**2008**): Service-dominant Logic: Continuing the Evolution. *Journal of the Academy of Marketing Science*, 36 (1), pp. 1–10.

Vargo, S. L.; Maglio, P. P. & Akaka, M. A. (**2008**): On Value and Value Co-creation: A Service Systems and Service Logic Perspective. *European Management Journal*, 26 (3), pp. 145–152.

Viswanathan, M. & Sridharan, S. (**2012**): Product Development for the BoP: Insights on Concept and Prototype Development from University-based Student Projects in India. *Journal of Product Innovation Management*, 29 (1), pp. 52–69.

Volkmann, C. K.; Tokarski, K. O. & Grünhagen, M. (**2010**): Entrepreneurship in a European Perspective: Concepts for the Creation and Growth of New Ventures, Wiesbaden: Gabler Verlag.

Volkswagen (**2018**): Rwanda's Mobile Revolution. URL: https://www.volkswagenag.com/en/news/stories/2018/07/rwanda_s-mobile-revolution.html# [14.07.2020].

von Hippel, E. (**1998**): Economics of Product Development by Users: The Impact of "Sticky" Local Information. *Management Science*, 44 (5), pp. 629–644.

von Hippel, E. (**2005**): Democratizing Innovation, Cambridge, MA: MIT Press.

Wan, F.; Williamson, P. J. & Yin, E. (**2015**): Antecedents and Implications of Disruptive Innovation: Evidence from China. *Technovation*, 39, pp. 94–104.

Wan, W. P. & Hoskisson, R. E. (**2003**): Home Country Environments, Corporate Diversification Strategies, and Firm Performance. *Academy of Management Journal*, 46 (1), pp. 27–45.

Ward, T. B. (**1994**): Structured Imagination: The Role of Category Structure in Exemplar Generation. *Cognitive Psychology*, 27 (1), pp. 1–40.

Ward, T. B. (**2004**): Cognition, Creativity, and Entrepreneurship. *Journal of Business Venturing*, 19 (2), pp. 173–188.

Warschauer, M. & Ames, M. (**2010**): Can One Laptop per Child Save the World's Poor? *Journal of International Affairs*, 64 (1), pp. 33–51.

Webb, J. W.; Kistruck, G. M.; Ireland, R. D. & Ketchen, D. J., Jr. (**2010**): The Entrepreneurship Process in Base of the Pyramid Markets: The Case of Multinational Enterprise/Nongovernment Organization Alliances. *Entrepreneurship Theory and Practice*, 34 (3), pp. 555–581.

Weiblen, T. & Chesbrough, H. W. (**2015**): Engaging with Startups to Enhance Corporate Innovation. *California Management Review*, 57 (2), pp. 66–90.

Weick, K. E. (**1993**): Organization Redesign as Improvisation. In: Huber, G.; Glick, W. H.: *Organizational Change and Redesign*. New York. Oxford University Press, pp. 346–382.

Wernerfelt, B. (**1984**): A Resource-based View of the Firm. *Strategic Management Journal*, 5 (2), pp. 171–180.

Wieland, H.; Polese, F.; Vargo, S. L. & Lusch, R. F. (**2012**): Toward a Service (Eco)Systems Perspective on Value Creation. *International Journal of Service Science, Management, Engineering, and Technology*, 3 (3), pp. 12–25.

Williamson, P. J. (**2010**): Cost Innovation: Preparing for a 'Value-for-money' Revolution. *Long Range Planning*, 43 (2-3), pp. 343–353.

Wilson, A.; David, U.; Beatrice, E. & Mary, O. (**2014**): How Telecommunication Development Aids Economic Growth: Evidence from ITUICT Development Index (IDI) Top Five Countries for African Region. *International Journal of Business, Economic and Management*, 1 (2), pp. 16–28.

Winter, S. G. (**2003**): Understanding Dynamic Capabilities. *Strategic Management Journal*, 24 (10), pp. 991–995.

Winterhalter, S.; Zeschky, M. B.; Neumann, L. & Gassmann, O. (**2017**): Business Models for Frugal Innovation in Emerging Markets: The Case of the Medical Device and Laboratory Equipment Industry. *Technovation*, 66-67, pp. 3–13.

Witell, L.; Gebauer, H.; Jaakkola, E.; Hammedi, W.; Patricio, L. & Perks, H. (**2017**): A Bricolage Perspective on Service Innovation. *Journal of Business Research*, 79, pp. 290–298.

Witell, L.; Snyder, H.; Gustafsson, A.; Fombelle, P. & Kristensson, P. (**2016**): Defining Service Innovation: A Review and Synthesis. *Journal of Business Research*, 69 (8), pp. 2863–2872.

Wooder, S. & Baker, S. (**2012**): Extracting Key Lessons in Service Innovation. *Journal of Product Innovation Management*, 29 (1), pp. 13–20.

Woof, M. J. (**2020**): Nairobi's New Public Transport Project. World Highways. URL: https://www.worldhighways.com/wh8/news/nairobis-new-public-transport-project [08.12.2020].

World Bank (**2020a**): Doing Business: Measuring Business Regulations. URL: https://www.doingbusiness.org/en/rankings [17.09.2020].

World Bank (**2020b**): GDP Growth Rates. URL: https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=CN [08.09.2020].

World Bank (**2020c**): The World Bank in China: Overview. URL: https://www.worldbank.org/en/country/china/overview [09.09.2020].

World Bank (**2020d**): World Bank Country and Lending Groups: Country Classification. URL: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups [07.05.2020].

Yi, J. C. (**2010**): User-research-driven Mobile User Interface Innovation: A Success Story from Seoul. *Interactions*, 17 (1), pp. 48–51.

Yin, R. K. (**2014**): Case Study Research: Design and Methods. 5, Los Angeles, London, New Delhi, Singapore, Washington, DC: SAGE.

Yoo, Y. (**2010**): Computing in Everyday Life: A Call for Research on Experiential Computing. *MIS Quarterly*, 34 (2), pp. 213–231.

Yoo, Y.; Boland, R. J.; Lyytinen, K. & Majchrzak, A. (**2012**): Organizing for Innovation in the Digitized World. *Organization Science*, 23 (5), pp. 1398–1408.

Yoo, Y.; Henfridsson, O. & Lyytinen, K. (**2010**): Research Commentary: The New Organizing Logic of Digital Innovation: An Agenda for Information Systems Research. *Information Systems Research*, 21 (4), pp. 724–735.

Yunus, M.; Moingeon, B. & Lehmann-Ortega, L. (**2010**): Building Social Business Models: Lessons from the Grameen Experience. *Long Range Planning*, 43 (2-3), pp. 308–325.

Zahra, S. A.; Gedajlovic, E.; Neubaum, D. O. & Shulman, J. M. (**2009**): A Typology of Social Entrepreneurs: Motives, Search Processes and Ethical Challenges. *Journal of Business Venturing*, 24 (5), pp. 519–532.

Zahra, S. A. & Nambisan, S. (**2011**): Entrepreneurship in Global Innovation Ecosystems. *Academy of Marketing Science*, 1 (1), pp. 4–17.

Zeschky, M.; Widenmayer, B. & Gassmann, O. (**2011**): Frugal Innovation in Emerging Markets. *Research-Technology Management*, 54 (4), pp. 38–45.

Zeschky, M. B.; Winterhalter, S. & Gassmann, O. (**2014**): From Cost to Frugal and Reverse Innovation: Mapping the Field and Implications for Global Competitiveness. *Research-Technology Management*, 57 (4), pp. 20–27.

Zittrain, J. (**2006**): The Generative Internet. *Harvard Law Review* (119), pp. 1974–2040.

Zittrain, J. (**2008**): The Future of the Internet: And How to Stop It, London: Yale University Press.

Zomerdijk, L. G. & Voss, C. A. (**2011**): NSD Processes and Practices in Experiential Services. *Journal of Product Innovation Management*, 28 (1), pp. 63–80.

Zoogah, D. B. (**2008**): African Business Research: A Review of Studies Published in the Journal of African Business and a Framework for Enhancing Future Studies. *Journal of African Business*, 9 (1), pp. 219–255.

Zoogah, D. B.; Peng, M. W. & Woldu, H. (**2015**): Institutions, Resources, and Organizational Effectiveness in Africa. *Academy of Management Perspectives*, 29 (1), pp. 7–31.