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Dynamics of Digital Entrepreneurship and Innovation: Insights from an Emerging Market

Submitted by

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the requirements for the degree of

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ACKNOWLEDGEMENTS

DECLARATIONS

I hereby declare that this thesis has been prepared in accordance with the University's guidelines on the presentation of a research thesis and conforms to the regulations for the degree of Doctor of Philosophy. To the best of my knowledge, the contents of this thesis are my own work and have not been submitted for the award of any other degree. The thesis adopts three-paper format. As mentioned below, one of the papers (chapter three) is under second round of review in the Journal of the Association for Information Systems (JAIS) while another paper (chapter four) has been published in the European Conference on Information Systems (ECIS) proceeding. Due acknowledgement has also been made in the particular chapters.

- Khan, R. H., Constantinides, P., & Nandhakumar, J.. Digital Entrepreneurship and Innovation in Emerging Markets: Two Case Studies from Bangladesh. Under 2nd Round of Review in the *Journal of the Association for Information Systems.*

- Khan, R. H., Nandhakumar, J., & Constantinides, P. (2015). ICT Driven Transformation of State-owned Enterprises in a Developing Country. *Completed Research Papers, ECIS Proceedings,* Paper 98. ISBN 978-3-00-050284-2, http://aisel.aisnet.org/ecis2015_cr/98

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ABSTRACT

In the recent years, the pervasive use of digital technologies has remarkably changed our society. Realizing its huge potential for transforming a society, many emerging markets worldwide have widely adopted digital technologies aiming at poverty reduction, rapid socio-economic development and sustainability through a better connected society. However, despite its large scale adoption, a major percentage of digital technology-based projects in these markets have failed completely or partially. Considering the unique characteristics of emerging markets, it is now well acknowledged that the canonical set of methods used for innovation in developed economies do not work in the emerging markets and need doing things differently. As these projects are often led by entrepreneurs who lack in local knowledge, the projects suffer in contextualization of innovation leading to failure. This doctoral thesis examines dynamics of digital innovation in emerging markets focusing on digital entrepreneurship, digital technology driven enterprise transformation and co-creation of IT value for the firms engaged in such digital ventures.

This thesis adopts three paper format and is grounded in concepts and theories from wide range of related and intertwined academic literatures: those of digital innovation in emerging markets, digital innovation and entrepreneurship, liminality, enterprise transformation, path creation, co-creation of IT value and social-commercial alliance. As methodologies, I have adopted interpretive cases studies and conducted three case studies in an emerging market, Bangladesh to collect empirical data. One of the papers is based on single case while two others are drawn on two cases.

The first paper investigates two digital innovation projects in emerging markets drawing on liminality to explore how contexts and entrepreneurial agency in emerging markets co-evolve through digital technologies. Drawing on a single case, the second paper examines the transformation of an organization that adopts ICT. And finally, the third paper explores the process of co-creation and emanation IT value in two social-commercial alliances that embeds IT as their key resources for innovation.

Overall, the thesis has several contributions to the theories and for practice. Specifically, the key theoretical contributions of the thesis are: 1) illustrating that digital innovations in emerging markets offer liminal space for entrepreneurs, 2) conceptualizing digital entrepreneurship and innovation as a constitutive process, 3) developing a process framework for digital innovation and entrepreneurship in emerging markets, 4) offering three practices for digital innovation in emerging markets, 5) conceptualizing ICT-based enterprise transformation in emerging market as a process of path creation, 6) offering 'mindful deviation' as a key practice for enterprise transformation, 7) developing a theoretical model for co-creation of IT value in social-commercial alliances and 8) building theoretical propositions related to firms' motivations for co-creation through IT. Further to that, I discuss several practical implications of the findings and also offer few implications for future research.

CHAPTER ONE
Introduction

1. BACKGROUND AND MOTIVATION

Innovation has traditionally been recognized as one of the key decisive competitive factors for organizations, industries and even for countries. While organizations have innovation on their priority agenda for sustaining their competitive advantage in the market (Ostrom et al., 2010; Daniel et al., 2013), countries fostering high innovative activities tend to have higher productivity and income leading to development and economic growth (Fagerberg, 2005; Autio et al., 2014). In many of these innovative endeavors, technologies have been found to play a key enabling role (Xiao et al., 2013; Srivastava & Shainesh, 2015). In recent years, the growth of digital technologies and their pervasive use have propelled further innovations that take leverage of the unique capabilities of digital technologies. These innovations, widely known as digital innovations, produce novel products and services combining digital and physical components (Yoo et al., 2010) and have emerged as an area of enquiry with great significance to the information systems scholars (Yoo et al., 2010; Yoo et al., 2012).

However, as like mainstream innovation literature, current emerging literature in this field has been overwhelmingly dominated by studies originated in advanced and developed economies (Kiss et al., 2012; see also for example, Boudreau, 2012; Barrett et al., 2012; Henfridsson & Bygstad, 2013). It is widely believed that only developed economies have the infrastructure and amenities required for innovation (e.g., Chang et al., 2006). Indeed, those developed economies are attributed to have an abundance of resources for innovation (Srinivas & Sutz, 2008) and a similarity of the users' activities, skills, culture, objectives and assumptions to those of innovators (Srinivas & Sutz, 2008; Bhaduri, 2016). This enables the process of innovation in those economies to spring through clearly defined rule-based decisions and logical or scientific validation of actions (Bhaduri, 2016) based on formal research and development (Heeks, 2012). As a consequence, innovation in advanced economies is

often understood as a predefined sequence of phases (Salerno et al., 2015) which companies can manage under 'closed', 'laboratory' settings (Chesbrough, 2003; Heeks, 2012).

In contrast, research has shown that innovations in emergent markets are usually faced with resource constraints, weak infrastructure (Sheth, 2011; Kahle et al., 2013), market heterogeneity (Sheth, 2011), poor regulatory framework, direct interference from various levels of governments (Li & Kozhikode, 2009), and most importantly a user base with a very low income and low literacy (Pitta et al., 2008; Silvestre & Neto, 2014) having diverse cultural values. Such 'institutional voids' (Khanna & Palepu, 2010; Ravishankar, 2013) of emerging markets drive a transition from traditional innovation practices that takes place more often in a well-funded Research and Development (R&D) team based around an IT Lab in California or Massachusetts (Heeks, 2012); and challenges the established ways of thinking (Srinivas & Sutz, 2008).

Indeed, it is now well-acknowledged that entrepreneurs in emerging markets cannot exercise established innovation practices or adopt a canonical set of solutions (Srinivas & Sutz, 2008; Barrett et al., 2015) and they require revamping their prevailing mindsets tied to the old practices and established structures and routines (Heeks, 2012; Pervez et al., 2013). They have to release themselves from accepted knowledge (Anderson & Kupp, 2008; Westrup & Al-Jaghoub, 2009) and learn to do things differently (Walton & Heeks, 2011; Srivastava & Shainesh, 2015; Subramaniam et al., 2015). In a similar vein, it is also claimed that innovation theories being used in these markets are mostly based on developed economies which may not be applicable for these emerging markets (Hoskisson et al., 2000; Venkatesh & Sykes, 2013; Xiao et al., 2013). Acknowledging the differences, as opposed to applying existing western theories, researchers suggest developing theories for digital innovations based on emerging market contexts which is still limited (Avgerou, 2010; Xiao et al., 2013). Having recognized the great importance of context specific theory development for digital innovations in emerging market, this study investigates the dynamics of digital innovation in emerging markets focusing on digital entrepreneurship, enterprise transformation and value co-creation for entrepreneurs.

First of all, leveraging the explosive growth of digital technologies and its related applications, there has been lot of innovation projects to alleviate poverty and achieve socio-economic development in emerging markets (Andrade & Urquhart, 2009; Brown & Grant, 2010). However, despite the transformational potential of digital technologies to support socioeconomic development in those markets, most of the efforts have been reported to end up in partial or complete failures (Andrade & Urquhart, 2007; Walsham, 2012; Venkatesh & Sykes, 2013;). Such a large number of failures is often attributed to the lack of contextualized innovation (Avgerou, 2010; Walsham, 2012) that is aligned with local contexts overcoming the multifarious contextual factors mentioned earlier. These challenges play a key role as "lever" or "hurdle" in innovation dynamics, raising difficulties to understand the ways by which entrepreneurs can successfully innovate in this market (Hall et al., 2014). IS scholars have discussed two approaches – a universalistic approach and a situated approach toward addressing issues of these unique contextual factors (Avgerou, 2008; Avgerou, 2010) resonating the focus by and large either to entrepreneurial agency or the social contexts. Extant literature still lacks theory that is capable of addressing the true interrelationship of digital innovation with its contexts that shows contextualization of digital innovation (Avgerou, 2008; Avgerou, 2010) and calls for development of contextualized theories (Avgerou, 2010; Xiao et al., 2013). Again, Nambisan (2016) in a recent study argues that the wide spread use of digital technologies has transformed the nature of how entrepreneurship takes place at the intersection of digital technologies and called for further studies. Similarly, several other researchers have called for further studies highlighting the great significance of digital entrepreneurship and innovation to the IS field (Davidson & Vaast, 2010; Yoo et al., 2010; Fang et al., 2017). Thus, this thesis, at first, examines the dynamic interplay between entrepreneurial agency, context and digital technology to offer insights for digital innovations and entrepreneurships for emerging markets.

In parallel, as a variety of projects have been initiated deploying digital technologies in emerging markets, digital technologies have become an increasingly integral component of many enterprises (Basole & Demillo, 2006) often leading to transformation of those enterprises (Rouse, 2006). In a recent study, Nambisan (2016) argued that digital technologies have made entrepreneurship unbounded in terms of process and outcome. Similarly, other researchers argue that entrepreneurs involved in

digital innovation keep the innovation always intentionally incomplete and remain in a state of flux for further scale and scope of innovation (Kallinikos et al., 2013; Lyytinen et al., 2016). It is also suggested that digital technologies have offered flexibility and speed in digital entrepreneurship and innovation (Fang et al., 2017) providing unprecedented opportunities to incept and scale business ventures (Huang et al., 2017). Consequently, undertaking such ongoing entrepreneurial pursuits may have significant implications on the enterprises and eventually can transform an enterprise. However, to succeed in enterprise transformation, there is no best path or "silver bullet" (Buran & Chew, 2006; Lahrmann et al., 2010), rather the suitable approach is argued to be dependent on the contingent factors of the transformation context (Rouse, 2005; Buran & Chew, 2006; Lahrmann et al., 2010). This raises questions as to how enterprises transform amid multifarious unique challenges in emerging markets. This thesis, following an investigation of entrepreneurship in digital innovation, explores this phenomenon (enterprise transformation) in an emerging market as enterprises continually pursue opportunities capitalizing digital technologies.

Finally, given the extreme degree of challenges and lower profitability potential in these markets, commercial firms (specially multinational corporations) are found to be less motivated to engage in such innovation projects and leave these projects for governments, NGOs, or social organizations to pursue such initiatives (Prahalad & Hart, 2002; Prahalad, 2004; Anderson & Billou, 2007). On the other hand, great emphasis is placed on developing an effective ecosystem of diverse actors across organizational and geographic boundaries (Berger & Nakata, 2013; Foster & Heeks, 2013) to overcome those contextual challenges. Recent trends show, despite their low profitability that, local and multinational commercial firms are building partnerships with social enterprises to develop solutions to social problems (Berger et al., 2004; Reed & Reed, 2009) mostly deploying digital technologies (Andrade & Urquhart, 2009; Brown & Grant, 2010). In such engagements, new dilemmas emerge as the partnerships involve diverse organizations such as commercial firms, governments, social enterprises, nongovernmental organizations, communities, and the civil society (Bortagaray & Ordóñez-Matamoros, 2012). Each of these stakeholders has different motivations, skill sets, organizational culture and governance structure (Kale & Singh, 2009). Though digital technologies offer unprecedented opportunities, such diversity

may lead to exploitation of digital technologies and other resources shared in an alliance rather than creating value for firms through joint capabilities. Consequently, it deserves special attention of how commercial firms engaging into commercial-social alliances collectively leverage digital technologies to co-create value (Grover & Kohli, 2012). Given this backdrop, this thesis, explores the value commercial firms gain getting engaged in co-creation through digital technologies and how such co-creation takes place in commercial-social alliances.

By investigating the dynamics of digital entrepreneurship and innovation, this thesis aims to contribute in different streams of Information Systems (IS) and other relevant literatures. By shifting the context of study from developed to emerging economies, this thesis seeks to expand our understanding of digital innovation and entrepreneurship in different contexts, which can be a source of substantial significance for several reasons. Firstly, emerging markets have emerged as fertile ground and a centre for innovations (Immelt et al., 2009; Govindarajan & Trimble, 2012). Innovations in these markets are reported to grow 'at around three times the pace of the advanced ones' (Kiss et al., 2012: 266). Multinational corporations from developed markets could leverage their learning in these markets to better compete also in developed markets spurring successful innovation opportunities through 'reverse innovation' (Govindarajan & Ramamurti, 2011; Govindarajan & Trimble, 2012; Zedtwitz et al., 2015). For example, technological products and services like portable ultrasound machines, Nokia mobile handset, mobile money were innovated in emerging markets and then penetrated the developed markets. Again, emerging market innovations may offer rich insights into the ways that entrepreneurs can apply their knowledge for a critical mass of "poor" people in developed countries (Subramaniam et al., 2015).

Similarly, emerging markets have also become a platform for MNCs based in those markets to become global players (Subramaniam et al., 2015). They stated that many of these emerging multinationals such as Haier from China, Reliance from India, and Vale from Brazil have made huge investments in developed market and have emerged as formidable competitors in the global market. These MNCs can take advantage of their experience in the emerging markets as well as the cheap labor cost, favorable regulatory framework and lower trade barrier to offer Western customers dramatically

more for less (Zeng & Williamson, 2007). As such, conducting the studies in the context of emerging markets deserve special attention.

Moreover, "approximately 75% of the world's population lives in emerging economies…[and also] the population growth rates of emerging economies are the highest of all countries" (Cavusgil et al., 2002:10). According to a projection, "by 2025, the combined GDP of the eight largest emerging economies are likely to be equal or larger than that of the eight largest advanced economies" (Kiss et al., 2012: 266–267). Considering the huge potential of these vast new markets, in 2012, global corporations invested more in these markets than in the core economies of the United States, Europe, and Japan (Rapoza, 2013) spurring innovation spirit through lower trade barriers and improvement of IT infrastructure (Xiao et al., 2013). In addition, every year many developed countries invest hundreds of millions of dollars (e.g., Heeks, 2009) aiming at rapid socioeconomic development of emerging markets since it is a key area of focus in the developed world (UNESCO, 2002; UN Millennium Project, 2005). Recognizing the criticality and extreme importance of emerging markets for the global economy, Avgerou (2008) argued that emerging economies are critical in shaping the future of the ICT-landscape (Avgerou, 2008) while Xiao et al. (2013) suggested digital innovation in these markets should materialize as an important research stream for IS scholars.

1.1 Objectives and research questions

This thesis adopts the three paper format and segments the whole research into three phases to better understand digital innovation in emerging markets giving a focus on digital entrepreneurship, enterprise transformation and value co-creation for entrepreneurs engaged in digital innovations in these markets. Accordingly, the research objectives and questions that I address in this study are divided and stated below.

The first phase of this research focuses on digital entrepreneurship and innovation in emerging markets. The research question that I address in this phase is:

RQ1: "How do entrepreneurial agency and contexts co-evolve through digital technology?"

By addressing this question, this phase of study theoretically and empirically contributes to the emerging literature of digital entrepreneurship and IS innovation literature for emerging markets.

The second phase of the research focused on enterprise transformation. The research question for this phase is:

RQ2: "How does a state-owned enterprise in a developing country transform in the context of ICT driven service innovation?"

This study contributes into the enterprise transformation literature exploring ICT driven service innovation in a state-owned enterprise. Finally, the third phase of this research investigates co-creation of IT value for the organizations engage into such digital innovations aiming socio-economic development of emerging markets. The research question for this phase is:

RQ3: How does a social-commercial alliance lead to co-creation of IT value?

By addressing this question, this study contributes to the IT value co-creation literature as well as into the literature of social-commercial alliance. In summary, by offering theoretical and practical insights into different streams of IS literature and relevant other literatures, the three studies altogether achieve the overall objectives of this thesis- better understanding of digital innovations and entrepreneurship in emerging markets. This study offers insights to those literatures drawing on three cases from Bangladesh, an emerging market. Though the general theme of all three studies relate to digital innovation in emerging markets, the three articles use the terms 'digital technologies', 'ICT' and 'IT' as found appropriate for the independent studies and outlets targeted. However, this use of different terms does not limit the findings to offer rich insights for digital innovations in emerging markets.

Table 1: Summary of the papers of this thesis

Paper Title	Key Theme	Contribution to Literature
Digital Entrepreneurship and Innovation in Emerging Markets: Two Case Studies from Bangladesh	• Constitution of digital entrepreneurship and innovation	• Illustrating that digital innovations in emerging markets offer liminal space for entrepreneurs • Conceptualizing digital innovation and entrepreneurship as a constitutive process • Developing a process framework for digital innovation and entrepreneurship in emerging markets • Offering three practices for digital innovation in the context
ICT Driven Transformation of State-Owned Enterprises in a Developing Country	• ICT driven enterprise transformation	• Conceptualizing ICT-driven enterprise transformation in emerging market as a process of path creation • Offering 'mindful deviation' as a key practice for enterprise transformation
Co-creating IT Value in Social-Commercial Alliances	• IT value co-creation in social-commercial alliances	• Developing a theoretical model for co-creation of IT value in social-commercial alliances • Building theoretical propositions related to firms' motivations for co-creation through IT

1.2 Structure of the thesis

This thesis is organized into six chapters. The following chapter (Chapter Two) provides a summary of the key themes to set the three papers and highlights the gaps in extant knowledge that the thesis addresses. The subsequent chapters (Chapters Three-Five) are devoted to present the three independent papers that cohesively achieve the overall objectives of the research. Finally, the conclusion in chapter six focuses on the summary of the contributions made to existing knowledge and explores implications for future research and practice.

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CHAPTER TWO
Literature Review

This chapter, by giving a brief review of the literature, introduces the key themes of the three papers. It also highlights the gaps investigated in those papers which have been elaborated in the independent papers in the subsequent chapters.

2.1 Emerging Markets and Its Unique Challenges

As explained in the introductory chapter, emerging markets have appeared to be significantly important in the world economy. Emerging markets are often defined as the 'low-income, rapid-growth countries' that adopt favorable policies for 'economic liberalization and a free-market system' aiming poverty alleviation and improvement of the living standards of their inhabitants (Hoskisson et al., 2000: 249). The term is often used interchangeably with developing countries or emerging economies to refer to the countries having low or middle levels of GNP per capita and having weak 'economic structure' (World Bank, 2004). While there are overlaps of the concepts in these terms, all the developing countries cannot be called emerging markets (Hoskisson et al., 2000). Rather following Xiao et al. (2013: 265), I consider emerging markets as "a subset of developing countries characterized by a higher economic growth rate and free-market economic policies" (Xiao et al., 2013: 265). However, though these markets have been conceptualized as grounds of 'institutional voids' (Khanna et al., 2005), the lack of resources, infrastructure and the fact that a large proportion of emerging market consumers are impoverished and often illiterate appear to be rather distinctive features that separate emerging markets from developed countries (Hall, 2014; Subramaniam et al., 2015). A recent and powerful stream of research that highlights this issue is 'Base of the Pyramid' (BoP) discourse (see for example, Prahalad, 2004). While more than two third of the population of emerging markets are poor and mostly illiterate, researchers argue (e.g., Nakata & Weidner, 2011; Ray & Ray, 2011; Subramaniam et al., 2015) that viewing emerging markets collectively from the BOP lens might offer better perspective that could stimulate economic growth of the emerging markets. As such, in this thesis, though I consider

emerging markets, my special focus is to the masses of low income and low to no literacy that represent majority of these markets.

Considering innovation as the means to resolve poverty as well as to the development of economy (c.f. Bradley et al., 2012; George et al., 2012), there have been a lot of innovation projects capitalizing digital technologies. Many studies have discussed the variety of contextual challenges intrinsic to digital innovations in these markets, ranging from lack of adequate infrastructures (Andrade & Urquhart, 2009) such as power supply (Ovia, 2005) and Internet connectivity (Andrade & Urquhart, 2007; Thapa & Saebø, 2011) to lack of national strategy, legislative regulations, and weak ICT and data policy (Latifov & Sahay, 2013; Madon et al., 2007). Other challenges include scarcity of people with appropriate ICT skills (Walsham, 2012), poor project management, resistance to change (Thapa & Saebø, 2014), lack of management support (Xiao et al., 2013), lack of knowledgeable leadership (Krishna & Walsham, 2005) and political instability (Thapa & Saebø, 2011). Lack of alignment within the multiplicity of interests, actors and technologies participating in the projects (Latifov & Sahay, 2013) along with inadequate financial resources (Best & Kumar, 2008) and over dependence on foreign donors (Odedra-Straub, 1993) are also attributed as major constraints to such initiatives. In addition, entrepreneurs often struggle to incorporate local communities (Puri & Shahay, 2007; Walsham, 2012) in the digital innovation projects and to build trust by changing those communities' mindset (Braa & Sahay, 2012). Researchers recognize that these unique contextual challenges have made entrepreneurial pursuits in emerging markets different than those in developed ones (Avgerou, 2008, 2010; Walton & Heeks, 2011). The widespread acknowledgement that emerging markets differ from developed countries in significant ways, stimulated further research to develop new paradigms, new theoretical efforts, and new methodological approaches (e.g., Hoskisson et al., 2000; Avgerou, 2008; Xiao et al., 2013). In a similar vein, Xiao et al. (2013: 271) argue that "… the arena of ICT [digital] innovation in emerging economies represents unchartered territory". Hence, this thesis investigates dynamics of digital innovation in emerging markets through three papers focusing on digital entrepreneurship, enterprise transformation and co-creation of IT value for the firms involved.

2.2 Constitution of Digital Entrepreneurship and Innovation

This section defines digital innovation and entrepreneurship as a constitutive process for this study.

2.2.1 Digital innovation and entrepreneurship

Digital innovation has been defined "as the carrying out of new combinations of digital and physical components to produce novel products" (Yoo et al., 2010: 725). Digital innovation is different by nature from other types of innovation because it is based on digital technology which supports reprogrammability of digital devices, homogenization of data, and self-reference (Yoo et al., 2010). The capabilities of digital technologies (i.e., reprogrammability, data homogeneity and self referencing) proposed by Yoo et al. (2010) are now well acknowledged by IS researchers. They stated that the reprogrammabilty of digital devices allows the device to perform a wide array of functions (such as calculating distances, word processing, video editing, and Web browsing) on its digital contents (audio, video, text, and image). Data homogeneity allows these digital contents originated from heterogeneous sources to be modified and combined easily with other digital content to deliver diverse services and also to access by different digital devices and through network. Finally, by self-reference, Yoo et al. (2010) note that digital innovation requires the use of digital technology (e.g., computers).

Zittrain (2008) discussed a few other related capabilities namely, leverage, adaptability and transferability, accessibility and ease-of-mastery. Leverage refers to "how extensively a technology leverages a set of possible tasks" while adaptability refers to "how well it [technology] can be adapted to a range of tasks" (Zittrain, 2008:71). He defined transferability as "how transferable any changes are to others—including (and perhaps especially) non-experts". The two other capabilities of digital technologies Zittrain (2008) mentioned are accessibility and ease-of-mastery. Accessibility refers to the ease of obtaining access to a technology (Zittrain, 2008) and affects both entrepreneurs and users while "A technology's ease of mastery reflects how easy it is for broad audiences to understand how to adopt and adapt it"

(Zittrain, 2008:72).

Incorporating both product and process innovation, Xiao et al. (2013: 266) conceptualize ICT innovation "as both a development process to produce a technological artifact, and one powered by one or multiple interconnected technological artifacts". ICT is understood as "a 'web' of equipment, techniques, applications and people that creates a social context, including the history of commitments that formed that web, the infrastructure that supports its development and use, and the social relations and processes of its use" (Boland et al., 2007: 634). Hence, ICT (digital technologies) is an engine for innovation (Boland et al., 2007). Innovation is broadly defined as the generation, development, and adaptation of ideas, practices, behaviors or material artifacts perceived to be novel by the relevant unit (e.g., individual, collective, unit of a firm or the whole firm itself) of adoption (Tushman & Nadler, 1986; Damanpour, 1991). For this study, a broader perspective of digital innovation is considered and conceptualize digital innovation as the development process of a novel solution that utilizes capabilities of digital technologies, in order to successfully create an improved "environment" (Boland et al., 2007) to the intended setting (e.g., an emerging market).

Entrepreneurship is defined as the process of identifying and exploiting opportunities for new innovation projects (Alvarez & Barney, 2007). In the last decade or so, the infusion and pervasive use of digital technologies have transformed the nature of entrepreneurship, that is, how entrepreneurs pursue opportunities at the intersection of digital technologies and entrepreneurship (i.e., digital entrepreneurship) (Nambisan, 2016). This transformation of entrepreneurial pursuits can be largely attributed to the distinct characteristics of three elements of digital technologies- digital artifacts, platforms and infrastructure. Digital artifacts are uniquely characterized as re-programmable, re-combinable and open (Yoo et al., 2010) that facilitates the infusion of such digital artifacts into a wide range of products and services (Lusch & Nambisan, 2015) and offers a state of flux for further scale and scope of innovation (Lyytinen et al., 2016). As a result, digital product or service designs remain somewhat incomplete enabling abundant opportunities to pursue for the entrepreneurs (Kallinikos et al., 2013). Similarly, entrepreneurs get a wealth of opportunities from digital platforms as it serves to host complementary offerings by infusing a degree of

generativity (Nambisan, 2016). Entrepreneurial outcomes become unpredictable and fluid since generativity of digital platforms allow for a recombination of its elements and to assemble, extend and redistribute its functionality (Yoo et al., 2010). Again, digital infrastructures allow to unfold the entrepreneurial process in a non-linear fashion across time and space since digitization enable product ideas and business models to be quickly enacted, modified and reenacted making the less clear of their temporal structure. As such digital technologies have offered flexibility and speed in digital entrepreneurship and innovation (Fang et al., 2017) providing unprecedented opportunities (Huang et al., 2017). Following Davidson and Vaast (2010), digital entrepreneurship, in this study, is defined as the pursuit of opportunities based on the use of digital technologies. In addition, taking into account that only a low percentage of entrepreneurs innovate (Autio et al., 2014), this study focuses on entrepreneurship that involves digital innovation.

2.2.2 Constitutive process

Entrepreneurship by and large has been considered either as an actor-centric perspective, or a context-centric perspective. In the first stream of research, individual entrepreneurs exhibit characteristics of a locus of control, a need for achievement, a risk-taking propensity (Low & MacMillan, 1998), self-efficacy (Bandura, 1977), and have been found to more likely recognize and exploit opportunities than others (Gartner, 1985). Some scholars have attributed entrepreneurial cognition (i.e., how they think and utilize their knowledge) for differences in entrepreneurial pursuits (Mitchell et al., 2002; Grégoire et al., 2011). Other researchers investigated entrepreneurial teams as they argued that team composition can influence innovation strategies, organizational dynamics and firm performance (Ruef et al., 2003).

In contrast, from a context-centric perspective, researchers emphasize contexts as they argue that contexts shape not only the available opportunities, but also the dynamics that unfold during entrepreneurial process (Aldrich & Fiol, 1994; Zahra & Wright, 2011). According to Powell et al. (2012), contextual differences offer different initial conditions as well as different possibilities leading to different trajectories in entrepreneurial pursuits. With respect to contexts, researchers have identified various parameters related to national, regional and industrial contexts and conceptualized

how those parameters across the different contexts shape entrepreneurial process. In addition to these contexts, Zahra and Wright (2011) offered further contextual facets like spatial, time, practice and change that researchers should take into their consideration.

Instead of focusing on agent-centric or context-centric perspectives, others have proposed a constitutive approach (Garud et al., 2014), whereby entrepreneurs seek to mold the context, shape it, and infuse it as entrepreneurial pursuits unfold. Entrepreneurs discover existing ideas to create others, and creatively imagine new ideas leading them to discover what exists (Garud et al., 2014). The result is a view of opportunities as constituted through an interactive and emergent process. Thus, digital entrepreneurship rests not only in the human entrepreneur or contexts but also in the capabilities of digital technologies to emerge as a constitutive approach of digital entrepreneurship. But, "prior research on technology entrepreneurship (Beckman et al., 2012; Zupic, 2014) has by and large focused on entrepreneurship as practiced in technology intensive environments (including digital technology), wherein technology is treated merely as a context for empirical work (e.g., Bingham & Haleblian, 2012; Vissa & Bhagavatula, 2012)" (Nambisan, 2016: 4). Again, many researchers (Avgerou, 2008; Xiao et al., 2013) emphasize on contextualized theory development for digital innovation focusing on emerging markets which the extant IS literature lacks. Given the backdrop, this study addresses this gap by investigating the constitution of contexts and entrepreneurial agency through digital technologies drawing on two digital innovation projects in emerging markets.

2.3 ICT Driven Enterprise Transformation

The following sections provide a conceptualization of enterprise transformation and path creation considered for this paper.

2.3.1 Enterprise transformation

Transformation of an enterprise refers to fundamental changes dismantling the "as is" enterprise to create the "to be" enterprise (Rouse, 2006b). It "encompasses both

broad internal changes in structure, systems, skills and even culture of an enterprise and deep changes in its external links to the environment" (ibid. 15), thus covering overall business strategy, relationships with suppliers, customers and other stakeholders (Hanna, 2010). As a consequence, transformation tends to be a long term process, not a single event or one-time fix (Rouse, 2006c; Hanna, 2010) and significantly differs from the numerous approaches (e.g., turnaround of business, reengineering of processes, process improvement, Total Quality Management (TQM)) to encounter challenges within the enterprise (Rouse, 2006a; Hanna, 2010). Fundamental changes with an organization means changing its "hearts and minds" (Shields, 2006) and such changes encounter powerful resistance from established institutional and social practices (Hanna, 2010). According to Scott and Mark (2006), entrepreneurs in a transformation team must "think out of the box" and challenge the status quo embracing the uncertainty and risks. However, there is no 'silver bullet' for successful ET (Buran & Chew, 2006; Lahrmann et al., 2010) while many studies indicate that EAM has the potential to support management of such ET (see, e.g., Pulkinen et al., 2007; Asfaw et al., 2009; Labusch & Winter, 2013). Buran and Chew (2006: 390), in this regard, state that "the essence of enterprise transformation is choice and focus". It is also argued that there is no single formula or process; rather, the appropriate approach is dependent on the contingent factors of the transformation context (Lahrmann et al., 2010).

2.3.2 Path creation

The notion of path creation has emerged as a powerful theoretical perspective to conceptualize innovation (Garud & Karnøe, 2001; Boland et al., 2007). This theoretical construct was developed in reaction to the theory of path dependence used in evolutionary economics (David, 1985; Arthur, 1989). The path dependence perspective takes for granted the firms and actors involved in change. According to this perspective, "the past intrudes into the present as a constraining force, contingencies that arise are experienced as unanticipated unprepared moments, and the future presents itself as a fundamentally uncertain terrain" (Garud et al., 2010: 768). Path dependence considers human actors play a passive or conservative role with respect to alternatives available in their environment (Boland et al., 2007) and emphasizes the contingencies and exogenous shocks to understand a technological

innovation and its adoption (Garud et al., 2010). Research in this tradition argue that firms may follow a shaped path while being constrained (locked-in) by their technologies (David, 1985), innovation process (Thrane et al., 2010), their services, strategies and business models (Prahalad & Bettis, 1986), organizational routines, skills and competencies, regulations and social norms (Karnøe & Garud, 2012). Through such constraints they become path dependent.

In contrast, the path creation perspective emphasizes the active role of entrepreneurs, who translate emergent ideas into actions, deviate from their original intentions to shape paths in real time and create new futures (Garud & Karnøe, 2001). Unlike the path dependence perspective, the path creation perspective considers emergent situations not as contingencies, but as conditions to be cultivated (Garud et al., 2010). Entrepreneurs use self-reinforcing mechanisms to strategically manipulate such contingencies rather than waiting for "exogenous shocks" (i.e., externally driven events or mechanisms such as market changes and the introduction of new technology (Newey & Zahra, 2009)) to escape "lock-in effects" and shape the trajectory of a change program. In this process, fully formed plans and visions are not preconditions, rather they emerge as part of the entrepreneurial process (Garud & Karnøe, 2001). Hence, the new technologies and innovation processes that become successful in a market reflect the dynamic interplay of distributed actors (Stack & Gartland, 2003). Garud et al. (2010) state that path creation offers a valuable perspective to explore and understand such emergent phenomena.

Thus, the discussions indicate that the study of ICT driven enterprise transformation in emerging markets deserves special attention, since successful enterprise transformation depends on contingent factors of the transformation contexts (Buran & Chew, 2006; Lahrmann et al., 2010) and digital innovation in emerging markets are entangled with multifarious unique challenges highlighted above. To better understand ET in this given context, by drawing on path creation (Garud & Karnøe, 2001) theory, this study investigates how a public enterprise engages in transformation while addressing the challenges of digital innovations in emerging markets.

2.4 Co-creating IT Value in Social-Commercial Alliance

This paper explores what and how IT value is co-created in social-commercial alliances. The following section gives a brief account of the relevant key concepts.

2.4.1 Co-creation of IT value

According Prahalad and Ramaswamy (2004:8) co-creation "is about joint creation of value by the company and the customer". By co-creation, researchers (Vargo & Lusch, 2006; Payne et al., 2008) have traditionally emphasized engagement of customers in value creation process and have placed customers at the same level of importance as the company as joint creators of value. In a study, Vargo & Lusch (2016: 8) defines value co-creation as "the actions of multiple actors, … , that contribute to each other's wellbeing". Distinguishing from co-creation between business and consumers, recent studies have focused on co-creation of value among multiple business firms (see for example, Kohli & Grover, 2008; Ceccagnoli et al., 2012; Han et al., 2012; Rai et al., 2012; Sarker et al., 2012). In the similar vein, this study, following Kohli and Grover (2008), conceptualizes co-creation as the robust collaborative relationship among multiple firms that jointly create and realize value for their mutual benefits which is unlikely to be created by any of these firms alone.

Investment in IT has been found to create value for a firm. IT value emanates in alliances between participating firms, which contribute IT resources such as technology, expertise or platform for creating, enabling or expanding value for the firms involved (Grover & Kohli, 2012). IT is considered a key interactional resource in value-creating relationships (Sarker et al., 2012; Srivastava & Shahinesh, 2015), which in combination with other resources can co-create new IT value (Grover & Kohli, 2012). The IS literature suggests that co-creation of value through IT can manifest itself in multifarious dimensions, though, such value should, directly or indirectly, lead to economic benefits for firms in an alliance. Firms may yield direct, tangible IT value by increasing ROI, market share, stock price (Kohli & Grover, 2008), sales, joint profit or stock returns (Stucky et al., 2011). Firms may also yield indirect, intangible IT value by achieving agility, flexibility, first-to-market, better

customer service (Kohli & Grover, 2008), reduction of cycle time or reduction of transaction costs, (Stucky et al., 2011). Being involved in co-creation participating firms in an alliance can co-create this new IT value that either firm is unlikely to create on its own. In this study, IT value is used to refer both economic and intangible value co-created for firms in an alliance. While extant IS literature focuses on IT value co-creation in B2B alliances, this study examines co-creation of IT value in social-commercial alliances.

2.4.2 Social-commercial alliance

A social-commercial alliance emerges when local and multinational commercial firms engage in partnerships with nonprofit and for-profit social enterprises to develop solutions to social problems (Berger et al., 2004; Reed & Reed, 2009). Social enterprises' primary goal is social development while commercial firms are in business primarily to pursue profits for owners or stockholders (Diochon & Anderson, 2011; Smith & Woods, 2015). Such alliances, thus, represent a marriage between opposing values (Zahra et al., 2009) with a complex institutional environment, which combines both for-profit and nonprofit logics or both (Dacin et al., 2011). The participant firms have different world view, values (Kourula & Halme, 2008) and cognitive limitation related to how they understand existing network of relationships (Lucea, 2008). There might be pressure created by the diverse motivations of allied partners, differences in their set of skills and organizational culture (Kale & Singh, 2009), governance structures put together to regulate and control their behavior (Zahra et al., 2009), income earning strategies, scope of activities, innovativeness, or sectoral differences in which they operate (Bacq et al., 2013; Hodge & Greve, 2005). As a result, in some instances, such partnerships have been reported as adversarial and antagonistic (Argenti, 2004; Burgos, 2012) and argued that partnership with commercial firms might influence the social performance of social enterprises negatively (Choi, 2015) leading to small likelihood of alliance success (Sarkar et al., 2009).

However, the inability of single firms to deal with the increasingly complex and risky social problems has stimulated such alliance to form (Berger et al., 2004; Reed & Reed, 2009; Vurro et al., 2010) and have emerged as a distinct field of inquiry

recognizing the differences from the traditional alliances. As such, while social enterprises and commercial firms engage in co-creation, the tensions and risks that arise between opportunities for joint gains and unilateral exploitation of resources shared (Kohli & Grover, 2008) may be more complicated than the traditional alliances (Han et al., 2012) and deserves more investigation. Given the backdrop, this study investigates co-creation of IT value in two social-commercial alliances wherein one alliance is nonprofit and another is for-profit.

In the subsequent chapters (the paper itself), these themes and the knowledge gaps have been discussed in details to investigate the specific phenomena in hand.

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CHAPTER THREE

Digital Entrepreneurship and Innovation in Emerging Markets: Two Case Studies from Bangladesh[1]

ABSTRACT

Recent research on entrepreneurship and innovation has made an effort to avoid a conceptual dualism between context and agency by placing emphasis on the interplay between the two. However, such a constitutive perspective still lacks an explicit theorization of the capabilities of digital technologies that could help explain how entrepreneurial agency and contexts co-evolve. This paper draws on the concept of "liminality" as well as the enabling capabilities of new digital technologies to examine the process of digital entrepreneurship and innovation in emerging markets. Unlike earlier studies applying a liminality lens, our focus is not on the physical separation of individuals from their organization, but rather on the symbolic separation from past knowledge and experience on innovation projects. We pay attention at how digital technologies enable entrepreneurs to overcome this separation, transition into new practices, and incorporate the innovation in the new context. We ground these ideas in two successful case studies of digital entrepreneurship and innovation in Bangladesh. Our analysis leads to the development of a process framework and three practices for successful digital entrepreneurship and innovation in emerging markets. We discuss the theoretical and practical implications of the process framework for further research.

1. INTRODUCTION

Recent studies on emergent markets have found that innovations in these markets are fundamentally different than those implemented in developed ones (Radjou et al., 2012; Xiao et al., 2013; Subramaniam et al., 2015). Indeed, developed economies are understood to have an abundance of resources for innovation (Srinivas & Sutz, 2008) and the users' activities, skills, culture, objectives and assumptions are well aligned with those of innovators (Srinivas & Sutz, 2008; Bhaduri, 2016). In contrast, research on emerging markets has shown that innovations in emergent markets are usually faced with resource constraints, weak infrastructure (Sheth, 2011; Kahle et al., 2013), institutional voids (Khanna & Palepu, 2010; Ravishankar, 2013), and a user base with a very low income and low literacy (Pitta, Guesalaga & Marshall, 2008; Silvestre & Neto, 2014). Consequently, the canonical set of methods used in developed economies does not work in emerging markets (Srinivas & Sutz, 2008; Radjou et al., 2012; Barrett et al., 2015). This makes it extremely difficult for entrepreneurs, who are experienced or have a cultural upbringing in developed economies or even for graduates indoctrinated following western textbooks to apply their knowledge and experience in emergent markets (Heeks, 2002).

These findings resonate with research in entrepreneurship and innovation, which focuses on the role of national, regional, and industrial contexts (Hu & Matthews, 2008; Hoskisson et al., 2013). Entrepreneurship is defined as the process of identifying and exploiting opportunities for new innovation projects (Alvarez & Barney, 2007), and innovation as the generation of novel ideas or combinations of existing ideas and routines that are perceived as new and valuable by individuals and organizations (Nelson & Winter, 1982). According to research that applies a context-centric perspective to entrepreneurship and innovation, contexts shape the opportunities that are available to entrepreneurs and have the potential to spawn different entrepreneurial trajectories (Zahra & Wright, 2011; Powell et al., 2012).

A separate stream of research on entrepreneurship and innovation places emphasis on entrepreneurial agency and how entrepreneurs are able to successfully innovate by applying their knowledge in different contexts (e.g. see Mitchell et al., 2002; Grégoire, Corbett & McMullen, 2011). According to such agent-centric perspectives,

the capabilities (e.g. risk-making propensity), knowledge and experience of entrepreneurs are important for identifying opportunities and exploiting them (McMullen & Shepherd, 2006). Context is conceptualized as an exogenous source of opportunity and challenge that can be seized or overcome by entrepreneurs to the extent that they are alert.

More recent research has suggested that, instead of looking at entrepreneurship and innovation in terms of a dualism between context and agency, we should approach it through a constitutive perspective (Garud et al., 2014). Entrepreneurial agency and contexts "co-evolve" through "recursive processes that evolve as the entrepreneur inter-faces with the sources of opportunity and engages in the venturing process" (Sarason et al., 2006: 288). Moreover, an entrepreneur's ability to identify and exploit opportunities continually changes based on new knowledge generated by interactions with other entrepreneurs and stakeholders such as investors, regulators, and advisors, but also local communities. A constitutive perspective is in line with more recent conceptualizations of digital entrepreneurship and innovation which is imbued with digital technologies (Nambisan, 2016; Nambisan et al., 2017). The unique characteristics of digital technology facilitate convergence and generativity (Zittrain, 2008; Yoo et al., 2010), allowing entrepreneurs to improve adoption for the users. Digital technologies enable entrepreneurs to create the context in which they seek to identify and exploit opportunities for entrepreneurship and innovation. At the same time, that very context is shaping the agency of those entrepreneurs, as they interact with a continuously evolving set of actors, who bring new challenges and new opportunities into the process.

Despite its contemporary significance, existing research in entrepreneurship has largely neglected the interaction between digital technologies and entrepreneurship (Beckman et al., 2012; Nambisan, 2016). Indeed, Xiao et al. (2013: 274) have recently called for "future research… [to] make greater effort to develop theories or frameworks of ICT innovation in emerging economies."

Thus, although useful in avoiding a conceptual dualism between context and agency, the constitutive perspective does not offer a process framework explaining *how entrepreneurial agency and contexts co-evolve through digital technologies.*

To address this research gap, we draw on the concept of "liminality" (Turner, 1977) which points to a process of *separation* from old practices, *transition* (or ambiguity) and *incorporation* to new practices (or transformation). We argue that entrepreneurs with different cultural backgrounds or with knowledge and experience attained in developed economies or similar markets go through this process of separation, transition and incorporation during digital innovation in emerging markets. The concept of liminality has already been applied in other IS research studies including the learning generated during new IS projects (Wagner et al., 2012), the trajectory shifts of institutional entrepreneurship (Henfridsson & Yoo, 2014) and the governance process of corporate social responsibility projects (Nicholson et al., 2015).

These past IS research studies have been loyal to Turner (1977) in that, they explored liminality in relation to the physical separation of individuals from their organizations. In this research, we focus on how entrepreneurs – both indigenous and non-indigenous – go through a symbolic separation, as they find that their past knowledge and experience does not apply in the new context. The idea of symbolic separation comes from the study by Howard-Grenville et al. (2011), who also use liminality to explain changes in cultural experience. Our study builds and extends on this idea of symbolic separation, by showing how entrepreneurs are able to recombine new and existing technologies and build new knowledge and experiences in the innovation process. To this end, we add an explicit consideration of the capabilities of new digital technologies, namely, data homogenization, reprogrammability (Yoo et al., 2010), accessibility and ease of mastery (Zittrain, 2008). We explore the ways by which these capabilities help entrepreneurial agency and contexts to co-evolve in the innovation process.

We apply these ideas on two successful innovation projects in Bangladesh. We show how in both projects, entrepreneurs were faced with contextual challenges that forced them to go through a process of separation from their past project knowledge and experience, before transitioning and finally incorporating new practices. In the first project with EduCorp, entrepreneurs came from developed economies and sought to develop platforms for educating the poor in Bangladesh. In the second case with AgriCorp, entrepreneurs came from a government development program in Bangladesh. Similar to EduCorp, however, AgriCorp entrepreneurs had to separate

themselves from knowledge and experience they had gained in prior projects with users that were technology literate and better off. In these new projects, entrepreneurs in both projects faced ambiguity in their established practices as they had to deal with technology illiterate and poor users under very difficult contextual conditions. We show how the context gave entrepreneurs opportunities to reflect on existing practices and innovate new ones, while shaping that very context.

Our empirical analysis enables us to develop a process framework that explains how entrepreneurial agency and contexts co-evolve through digital technology. The process framework is developed through a second order analysis of the capabilities of digital technology and the cluster of actions undertaken in the two case studies by entrepreneurs during the three phases of separation, transition, and incorporation. From this second order analysis, we derive three practices for digital entrepreneurship and innovation in emerging markets, namely, *a conscious adaptation of traditional practice, synchronizing users' capabilities and contingencies to digital technology,* and *fostering a dynamic engagement of collective efforts*. We discuss the implications of the process framework for further research in emerging markets.

The rest of the paper is structured as follows. In the next section, we provide an in-depth discussion of the concept of liminality and the three stages of separation, transition and incorporation. We discuss how previous studies have applied the concept and establish links with the literature on digital entrepreneurship and innovation. This is followed by our methods of data collection and analysis, before we present a description and analysis of the two case studies. Finally, we propose a process framework for digital entrepreneurship and innovation in emerging markets and conclude the paper with a discussion of contributions and implications for theory and practice.

2. LIMINALITY IN DIGITAL ENTREPRENEURSHIP AND INNOVATION

The concept of liminality was first used by van Gennep (1960) in his study of rites of passage. He expounded three phases "separation," "limen" or transition, and "aggregation" or incorporation, as a person passes from one state to another (e.g., childhood to adulthood) (Turner, 1977). The first phase of separation signifies the

detachment of the individual or group from an earlier fixed point in the social structure or a set of cultural conditions. During the intervening liminal phase, the characteristics of the ritual subjects (the "passengers") are ambiguous, as they pass through a social-cultural realm that has few or none of the attributes of the past or coming stage. In the third phase of incorporation, the passage comes to an end. The ritual subject is in a relatively stable state once more and, by virtue of this, has rights and obligations against others; the ritual subject "is expected to behave in accordance with certain customary norms and ethical standards binding on incumbents of social position in a system of such positions" (Turner, 1977: 95).

The liminal or transition phase is the most important one, since it is the least structured; those involved are "betwixt and between the positions assigned and arrayed by law, custom, convention and ceremonial" (Turner, 1977:95). The transition phase is thus liminal in the sense that it is a period of ambiguity. This ambiguous phase has both negative and positive connotations: people are temporarily beyond the normative social structure to which they are related to (e.g. a tribe, a social group, etc). This weakens them, since they have no rights over others, but it also liberates them from structural obligations and gives them the opportunity to reflect on their current condition (Turner, 1988). The ritual subjects come together as "a communion of equal individuals who submit together to the general authority of the ritual elders" (Turner, 1977: 96). In other words, the ritual subjects form a community, which represents a distinct modality of social relationship from the social structure of power and control held by the elders of the social group which the ritual subjects aspire to join during the incorporation phase.

These ideas have been applied in organizational research to describe the condition of temporary employees in flexible organizations (Garsten, 1999); to discuss the consulting experience (Czarniawska & Mazza, 2003); to consider the impact on individual and organizational learning (Tempest & Starkey, 2004); and to discuss intentional cultural change (Howard-Grenville et al., 2011). In information systems research the concept of liminality has been applied to examine the learning generated during new IS projects (Wagner et al., 2012); to identify the trajectory shifts of institutional entrepreneurship (Henfridsson & Yoo, 2014); and to define the governance process of corporate social responsibility projects (Nicholson et al.,

2015). From these studies we can identify three characteristics of liminality, which become important analytical points for our study of digital entrepreneurship and innovation.

The first characteristic is *ambiguity*. Liminality breeds ambiguity because it offers both risks and opportunities for those involved. For instance, in her study of temporary employees, Garsten (1999) argues that, "lacking the structural bond created by a regular employment position, yet drawn into extended circles of loyalty, temporary employees share some of the inter-structural and ambiguous characteristics of liminality" (Garsten, 1999: 603). Tempest and Starkey (2004) build on these insights to argue that the impact is both positive and negative. Their study of television production firms and their reliance on outsourcing contracts show how production projects are faced with both opportunities and risks. On one hand, this ambiguity enables individuals and organizations to broaden their scope of learning, while they explore new areas of knowledge and skills. On the other hand, however, this ambiguity also means that individuals and organizations do not have the structural support they would usually have in a stable social context, as they recombine skills and knowledge across a fluid and ever-changing network of workers (Tempest & Starkey, 2004).

This is related to the second characteristic, the *opportunity to experiment and explore novel ideas*. As mentioned earlier, those going through a liminal or transition phase, are liberated from structural and institutional constraints and obligations (Turner, 1977). This gives them the opportunity "to experiment and explore options, unfettered by the ongoing daily operations" (Wagner et al., 2012: 6). Wagner et al. (2012) show how, by isolating themselves from the physical constraints of their organization, a project team working on a new enterprise system were offered the opportunity to experiment with new ways of working. Similarly, Howard-Grenville et al. (2011:525) showed how, "liminality encourages ... playfulness and the exploration of new possibilities." While going through a liminal or transition phase, those involved actively consider the possibilities for "constructing new… resources and altering (typically deployed) strategies of action" (ibid. 525). In their study of product innovation at a small European car manufacturer, Henfridsson et al., (2014) conceptualize this opportunity to reflect and experiment with new options in three

interconnected mechanisms: reflective dissension, imaginative projection, and eliminatory exploration. "Reflective dissension establishes differences and boundaries that highlight the need for a new innovation trajectory, imaginative projection repairs the ruptures by shaping the contours of a new innovation trajectory, and eliminatory exploration ferments an innovation trajectory to materialize a new solution" (Henfridsson & Yoo, 2014: 14). All three of these mechanisms take place during a "trajectory shift" which is imbued with liminality.

A final characteristic of liminality is that it engenders a strong *sense of community* among those involved. As mentioned earlier, communities emerge among those going through liminality because social structure is absent (Turner, 1977). These communities are both spontaneous and temporary, but, "the need to organise and mobilise resources and the necessity for social control among members … in pursuance of these goals," may help to organize these communities as more enduring modalities of social relationship (Turner, 1977: 132). For instance, Nicholson et al. (2015) show how through a corporate social responsibility project for a school in India, participants institutionalised community values into the regularised practices of the client and provider while widening awareness of the school sponsorship to a joint collective. Wagner et al. (2012:3) cautioned, however, that "while there may be a strong community among those sharing the liminal space, the corresponding disconnection from those within the existing ongoing organizational structure threatens the organization's social capital". In addition, the knowledge generated within that community may not extend to the rest of the organization who will therefore remain rooted in the old practices. As Wagner et al. (2012) argue, this may set the scene for active resistance to new innovations.

In the next section, we combine these ideas from research employing the liminality concept with research on digital entrepreneurship and innovation.

2.1 Liminality in digital entrepreneurship and innovation in emerging markets

The three phases of separation, transition and incorporation are very useful in explaining the process of digital entrepreneurship and innovation in emerging markets. The contexts of entrepreneurs and users in emerging markets are often quite

different in cultural, physical, economic and many ways (Heeks, 2002). Entrepreneurs, who have hands-on entrepreneurial experience within an advanced country context (e.g., consultants, IT vendors, aid donors) or who are educated in developing economies through western models, will engage in entrepreneurial ventures that reflect their contextual inscriptions and lead to failed entrepreneurial ventures (Heeks, 2002). This is why, it has been widely reported in the literature that the canonical set of methods used in developed economies do not work in emerging markets (Srinivas & Sutz, 2008; Radjou et al., 2012; Barrett et al., 2015). Instead, entrepreneurs are often found to set aside their accepted contextual knowledge and existing practices (Westrup & Al-Jaghoub, 2009; Kumar & Bhaduri, 2014) and do things in new ways (Srinivas & Sutz, 2008; Steven et al., 2014; Barrett et al., 2015; Srivastava & Shainesh, 2015). The distinctiveness of an emerging market's context shapes the ways by which entrepreneurs can apply their knowledge and experience and thus exploit new opportunities for innovation (Zahra & Wright, 2011; Powell et al., 2012). Thus, entrepreneurs go through a phase of separation from their contextual knowledge, preconceived idea and established innovation practices. Unlike past research that has applied the liminality lens, our focus in this paper is not on the physical separation of individuals from their organization, but rather on the symbolic separation from past knowledge and experience on innovation projects.

Second, such separation causes entrepreneurs in emerging markets to experience ambiguity in relation to addressing the unique challenges found in emerging markets such as weak infrastructure (Sheth, 2011; Kahle et al., 2013;), institutional voids (Khanna & Palepu, 2010; Ravishankar, 2013), and a user base with a very low income and low literacy (Pitta et al., 2008; Silvestre & Neto, 2014). As such, entrepreneurs go through a transition phase whereby new practices "compete" with established practices of an entrepreneur's existing repertoire (Weber, 2005). Thus, they face ambiguity as they start to reflect and experiment with new options. During this phase, entrepreneurs can utilize new digital technologies to deal with the liminality they face. Digital technologies can enable this process because they are "intentionally incomplete and perpetually in the making" (Kallinikos et al., 2013: 357; see also Garud et al., 2008). Thus, they do not limit the range of tasks they can accommodate, offering opportunities to entrepreneurs to reflect and experiment with new options.

The unique capabilities of digital technologies, namely, data homogenization, reprogrammability (Yoo et al., 2010), accessibility and ease of mastery (Zittrain, 2008) become very important during this phase. Data homogenization refers to the capability of storing, transmitting, processing and displaying "any digital content (audio, video, text, and image) … using the same digital devices and networks" (Yoo et al., 2010: 726). In addition, this digital content originating from different digital devices can be combined easily with each other to provide a multitude of different services. Reprogrammability refers to the capabilities of a digital device to perform a wide array of functions (such as sending SMS, supporting interactive voice calls, making online payments etc.) not intended for in the original design of the device (Yoo et al., 2010). These capabilities facilitate the infusion of digital technologies into a wide range of products and services (Lusch & Nambisan, 2015) enabling further opportunities to explore for scale and scope of innovation (Lyytinen et al., 2016) through convergence and generativity (Yoo et al., 2012).

Two other capabilities of digital technologies become very important during this phase, namely, accessibility and ease-of-mastery. Accessibility refers to the ease of obtaining access to a technology (Zittrain, 2008) and affects both entrepreneurs and users. Some technologies may be easy to use but hard to obtain because of costs and other reasons such as, taxes, regulations etc. This is where mobile technologies come to the fore since they are the most widely adopted technologies on the planet (World Bank, 2016), making them accessible to wide number of users. This is a capability that entrepreneurs need to cultivate with the users, while mobilizing support from a number of different stakeholders including donors, regulators and technology providers (Heeks & Stanforth, 2014). "A technology's ease of mastery reflects how easy it is for broad audiences to understand how to adopt and adapt it" (Zittrain, 2008:72). Ease-of-mastery is a capability that enables users not entrepreneurs. It refers to the skills required to adopt a technology and adapt it to local needs. Once again, the example of mobile phones becomes important here because it is a technology that is easily mastered without much training, as we observe in M-Pesa where basic mobile phones are used for the delivery of banking services in Kenya (Hughes & Lonie, 2007).

Certainly, the above capabilities of digital technologies are not isolated enablers of

change. Rather, they have to be combined with support from a community of diverse stakeholders. Creating a sense of community across different stakeholders (Czarniawska et al., 2003) enables the filling up of the knowledge and experience gap found in emerging markets and especially among technology illiterate and poor users (Walton & Heeks, 2011; Nurdin et al., 2014). At the same time, creating a sense of community promotes innovativeness and enhances the propensity for entrepreneurs to take risks (Aldrich & Fiol, 1994; Hall et al., 2012; Lumpkin et al., 2013), while reducing the threat of project failure (Park & Lejano, 2013). The use of different digital technologies in entrepreneurial ventures contributes to such involvement of diverse actors across time and space, and transforms the focus on the distributed set of actors (Nambisan, 2016) including local users.

Finally, entrepreneurs come up with a contextualized digital solution for this market and, gain valuable experience and enrich their contextual knowledge of emerging markets from diverse actions undertaken during the transitional phase. Entrepreneurs "recognize" these experiences and knowledge and "come to realize" the greater significance of new practices (Beech, 2011:289). Eventually, they internalize these new practices as a reference for their future digital innovation projects in similar markets. While many diverse actors may get involved in the entrepreneurship process, in this study, we use the term 'entrepreneur' to refer to only those who played a dominant role in leading the innovation projects and who did not have local knowledge of the contexts of innovation but had prior experience of working in affluent markets. For others involved in the process, we use the term 'actor'. In the next section we discuss our methods, including how we analyse the two case studies of digital entrepreneurship and innovation drawing on these concepts.

3. RESEARCH SETTING AND APPROACH
3.1 Research setting

The research setting for this study encompasses two cases of digital entrepreneurship (AgriCorp and EduCorp- all pseudonyms) initiated for the poor communities in Bangladesh. One of the researchers spent time in Bangladesh investigating these two digital innovations from December 2013 to September, 2015 (see Table 1 for details). The first study, AgriCorp started with SMS-based purchase orders (e-Purjee) issued to

sugarcane growers' during the crushing season to supply a specific amount of cane to sugar mills on a scheduled date. By incorporating other services and managerial tools, this simple initiative eventually replaced the 80 years' legacy sugarcane procurement system benefitting both the farmers and the sugar mills. The second study, EduCorp is the first of its kind multi-platform educational service, which enables millions of adults to learn the English language affordably. Using non-conventional tools such as television dramas and game shows, mobile phone based interactive voice response (IVR) calls and SMS, along with conventional methods of print-materials, CD/DVDs and Internet-based learning, EduCorp has focused on teenagers and adults aged between 15-45 years to improve their English as a route into work and out of poverty. Table 1 below summarizes the empirical setting for each case study.

Table 1: Empirical setting

	Organization	
	AgriCorp	**EduCorp**
Type of organization	Government	International donor organization
Service sector	Agriculture	Education
What is the initiative	Implementing a digital sugarcane procurement system	Implementing IT based teaching for improving English communication skills
Platform	Multiple (mobile, web-based PC)	Multiple (mobile, web-based PC, TV, CD, Book, newspaper)

In selecting these cases, our primary interest was to find out successful digital innovations targeting the poor in emerging markets. Success was to some extent measured by the growth of customer base over the years after the initial implementation of digital technologies (Public documents of EduCorp, 2013), and user satisfaction (AgriCorp Public document, 2013). In addition, the projects by AgriCorp and EduCorp were 'new-to-the world' (see Avlonitis et al., 2001) and received good number of awards at home and abroad for their remarkable success. This selection of two cases enabled us to explore the variation of entrepreneurial pursuits in several digital innovations in an emerging market context. Particularly, our motivation was to choose digital innovations in diverse service sectors (e.g.,

education, agriculture) and led by different entrepreneurs (e.g., indigenous or non-indigenous) to create more robust theory grounded in varied empirical evidence (Yin, 1994; Eisenhardt & Graebner, 2007).

Finally, the study was undertaken in Bangladesh since more than three-fourth (76.54%) of the population in this market are poor (World Bank, 2013). In the literature that focuses on technology-based initiatives of the poor, only a few numbers of cases are based in Bangladesh (Warnholz, 2008) relative to other markets in Asia and Africa (Kolk et al., 2014). Similarly, Thapa and Sæbø (2014) note that current research in the ICT4D literature is mainly conducted in sub-Saharan markets, India, and Latin America.

3.2 **Data collection**

We conducted a combination of semi-structured interviews, unstructured interviews (for users), direct observations and document analysis in two cases (see Table 2 for details). The aim was to gain a deep understanding of events (Nandhakumar & Jones, 1997), while also seeking a new angle on the topic being investigated (Kvale, 1996). In total, 37 interviews (26 semi-structured and 11 unstructured interviews) were conducted over a period of twenty two months in three phases.

To provide a cross sectional view of how innovation unfolded, we approached interviewees across different levels (i.e., executive to senior managers within organizations, other participants like agent, distributor etc.) within each case study (Eisenhardt & Graebner, 2007). Several follow-up interviews (both face to face and over skype) were also carried out for more insights of certain issues of interest that emerged after initial analysis of the data collected. Since one of the researchers is bilingual (English and Bengali), the interviewees were offered the flexibility to use English or Bengali. The interviews were conducted at the work place of the interviewees and lasted between 50 to 90 minutes. Most of the interviews were tape recorded and transcribed while written notes were taken for all the interviews. In addition, we had multiple informal discussions with key participants from both case studies over the phone and via Skype to further clarify our interpretation of few aspects. The follow-up and informal interviews were with the same participants

interviewed earlier. Written notes were taken during all formal and informal interviews. For the users in both cases, unstructured interviews were conducted in Bengali, so that they could share their personal experiences (of how the innovation unfolded for them, their involvement in this journey, reactions to changes etc.) openly and freely (Kvale, 1996). The selection of users was based on convenience and was facilitated by a mobile operator in the case of EduCorp. On the other hand, during a sugar mill visit in Faridpur in July 2014, farmers who were registered with that mill and who interacted with the system were interviewed. One of the researchers had the opportunity to experience EduCorp innovations personally and to observe the innovations for AgriCorp at work in the sugar mill visited and the central office in Dhaka (the capital of Bangladesh). Finally, we accessed a large volume of archival data including project plans, survey reports, progress reports, news clippings, company websites, campaign materials (e.g., dramas, electronic advertisements, brochures, posters). The documents were reviewed to get background information on the operation of the projects and to verify and confirm the interpretations made through the data analysis process.

Table 2: List of interviews and data collected

		Organization	
		AgriCorp	**EduCorp**
Phase one (Three Weeks: Dec, 2013- Jan., 2014)	Empirical data	2 interviews	2 interviews
	Participants' profile	• 1 senior manager • 1 senior executive	• 1 manager • 1 ex-manager
Phase two (Four months: June, 2014 – Sept, 2014)	Empirical data	12 interviews, system observation and documentation	6 interviews, system observation and documentation
	Participants' profile	• 1 ex-senior manager • 3 managers (1 ex-manager included) • 1 project coordinator and 2 IT specialists /engineers	• 1 ex- manager • 2 senior executives • 2 representatives from two partner telecom operators • 1 representative from

		• 5 users (farmers)	media
Phase three (Three months: Jul., 2015 – Sept., 2015)	Empirical data	5 interviews	10 interviews and documentation
	Participants' profile	• 1 project coordinator • 1 mill manager • 1 cane development officer • 1 representative from software firm • 1 representative of telecom operator	• 1 senior manager • 1 executive • 1 representative from media • 1 technical service provider • 6 users
Total		19	18

3.3 Data analysis

Our data collection yielded a large volume of data from interview transcripts, observation notes and other materials. In the first instance, each of the interview transcripts was reviewed for identifying common themes. For both cases, based on the commonality of the responses, the data set was extracted and clustered together into categories representing similar themes. These categories were then coded and among others, key themes were identified based on frequency of mention in the interviews. We examined the relationship among those themes (Strauss & Corbin, 1998), while at the same time, consulted the relevant literature on digital entrepreneurship and innovation, as well as ICT4D in search of a suitable framework that could explain our thematic analysis. After a recursive iteration of relating extracted data to relevant theoretical constructs, liminality (Turner, 1977) was deemed as a powerful theoretical framework for our study.

We then further investigated the extracted data sets that related to transition since we noted a significant portion of our empirical data represents this phase. Following Miles and Huberman (1994), we coded (descriptive) those data into three groups of concepts (Appendix 3.A) underpinning the research question. The first group represented entrepreneurs' experience and actions they undertook, the second group

of concepts focused on key contextual challenges entrepreneurs faced and the final group was on their consideration to choose a particular technology. We sought answers of how and under what circumstances those actions were undertaken and noted connections among these groups of concepts (Strauss & Corbin, 1998). By focusing on the transition phase, we observed that while entrepreneurs' actions shaped contextual challenges in few instances, at the same time, contextual challenges influenced entrepreneurs to undertake specific actions. In parallel, we also noticed how the capabilities of digital technologies – data homogeneity, reprogrammability (Yoo et al., 2010), accessibility and ease-of-mastery (Zittrain, 2008), enabled entrepreneurs to undertake those actions (see Appendix 3.B). Finally, we undertook a second order analysis that helped us to identify three new practices to explain the co-evolution of digital entrepreneurship and innovation in emerging markets (see Appendix 3.C).

To assist readability and comprehension, we present our findings and analysis in a conventional linear structure. We start with a presentation of the data without any theoretical interpretations (section 4). We then carry on with a theoretical analysis of the two case studies using the three phases of separation, transition and incorporation, as well as a consideration of the capabilities of digital technologies (section 5 and Appendices 3.A and 3.B). Then, in section 6, we develop a process framework that explains how entrepreneurial agency and contexts co-evolve through digital technology (Appendix 3.C).

4. SUMMARY OF CASE STUDIES
4.1 Case 1: EduCorp

EduCorp was an initiative for learning English outside the classroom by harnessing the latest communications and multimedia technologies. A fund of GBP 50 million granted by a foreign donor organization for a period of 9 years (2008-2017) gave EduCorp the opportunity to contribute to the economic development of Bangladesh. The aim was to improve the English language skills of millions of underserved Bangladeshi people aged between 15 to 45 years, many of whom live in extreme poverty. The key objective was to help this target population to achieve better access

to the world economy as stated in a public document (EduCorp Public Document, 2013):

> *"Nearly 70 million Bangladeshis survive on less than a dollar a day and a third of the urban population lives in slums. The programme supports the internationally agreed Millennium Development Goals, which are aimed at eradicating extreme poverty, by providing language skills that will help people to find jobs, engage in entrepreneurial activities and improve their standard of living".*

Until recently, about a quarter of the adult population in Bangladesh (over 28 million) accessed at least one of the media services (voice call or SMS via mobile, website for desktop or mobile users, newspaper, television, book or CD/DVDs) offered by EduCorp. Around 7 million mobile users and 2.5 million web users were found to be highly engaged with the service. A recent study by EduCorp indicates that 8.8 million people felt they had learnt English from EduCorp media products, 7.7 million claimed they used the English learnt from EduCorp while all the perceived indices related to learning English were found very encouraging and remarkably positive relative to initial projections (EduCorp Internal Document, 2013). However, the innovation process of these nine national and international award-winning services was not simple, rather it faced numerous challenges.

The initiative was a response to a request by the Bangladesh Government for assisting in the development of English communication skills of its people and managed by an international developmental organization. Among others, there were many participants involved including six mobile operators, the telecommunication regulatory authority, a research firm, different media companies, and a technical vendor. EduCorp was a multicultural group with professionals mostly from UK and Bangladesh, but also from USA, Australia and New Zealand who were recruited by the international organization. However, the project was led by non-Bangladeshi professionals with cultural backgrounds and work experience in western countries, something that influenced the project in the beginning.

Initially, the non-indigenous senior management considered radio to be the best platform to reach the poor, though there were differences in opinions among the

employees. However, after a survey conducted on the target people, mobile phones were selected as the primary platform to deliver the service. An interviewee stated:

> *"Even after the findings in a survey, it was hard for the senior management to believe that radio was not in the list and mobile was the most lucrative media for the people. They were not at all convinced, still they had to choose mobile as a platform".*

The decision of choosing mobile phones for teaching English was criticised and ridiculed by many people. Even the mobile operators were not initially convinced of such a non-conventional initiative. EduCorp entrepreneurs also faced challenges in selecting appropriate content and accents for the course materials, as was reflected by an interviewee:

> *"The content was first developed by British professionals giving a dominance of (their) context. […] if the content is like: 'Do you want to ride a tube? Two friends are gossiping at the bank of the Thames.' How many people in Bangladesh will understand the term tube and Thames? They will think whether it is a river! A place! A food! Or something else! […] We changed the content, even the accent".*

EduCorp negotiated with the BTRC (Bangladesh Telecommunication Regulatory Authority) and AMTOB (Association of Mobile Telecom Operators of Bangladesh) for their support to the initiative. Both of these institutions helped to hook six mobile operators in the country as key participants in the project, including a technical vendor (SoftTech-pseudonym). However, when the operators were approached with the concept of this service, three of them expressed the desire to deliver the service exclusively by themselves for only their customers but not for others. So, EduCorp was faced with the challenge to bring all the mobile operators under the same umbrella. In November 2009, EduCorp started delivering services to the target people using mobile phones though the focus was on television which was the second preferred medium by those users.

It was found that poor people found it hard and expensive to learn English. They believed that English is for the affluent people. To change this perception, EduCorp telecasted targeted educational television programs such as the youth magazine show

"EduCorp" Buzz, bilingual supernatural drama series *Bishaash* ('believe' in English) and a game show *"EduCorp" – Mojay Mojay Shekha* ('Learning with Fun' in English). All of these programs enabled the entrepreneurs to break the perception that English is hard and built interest among the audiences. On the other hand, though both SMS and IVR service were simultaneously adopted for mobile phone users, they focused on IVR service as they found a low readability of SMS among the users. In the meantime, EduCorp, BTRC and the six mobile operators together negotiated a common short code that could be used to access the service. Hence, mobile phone users of any operator in Bangladesh could simply dial the short code to access the daily three-minute audio lessons through the mobile IVR service at a discounted tariff. The lessons (offered both in text and audio) could also be accessed and downloaded through a dedicated website. Despite the preference of mobile IVR service to the users, most of the budget was initially allocated for the television game show and drama. However, having recognized the wide acceptance of the IVR service, the non-indigenous senior management started changing their position.

EduCorp entrepreneurs faced difficulties with designing appropriate service modalities to make it easily understable and accessible to the users. Considering the customers' level of education, EduCorp incorporated Bengali as a language of instruction to teach English. They found that basic handsets did not support Bengali while the Internet speed in many areas was a problem to access the websites. They used Bengali for websites of both desktop and mobile users, with the development of each being really challenging. A participant claimed:

> *"The basic handsets they (poor) use do not support Bengali fonts. The challenge was to incorporate Bengali as gif files into the WAP portal (mobile based web services). [...] (EduCorp) is the first complete Unicode supported Bengali website which facilitates Bengali without installation of any particular font in an Internet browser. We created a highly usable information architecture for the site that uses both Bengali for navigation and English for content. Even the error messages were displayed in Bengali".*

In addition, based on customer feedback, EduCorp started publishing the lesson materials four times a week in the market's most popular Bengali newspaper "Prothom Alo" attracting over 800,000 regular readers. While they found the

customers used to clip that content from the newspapers and pile it up as a book, they negotiated with a book publisher and published the course materials as a book. To increase its reach to other segments of the society they also published CD/ DVD by a production house. EduCorp persuaded its partners to get associated with this developmental project. Eventually, the cost of all these forms of services and products was low as all the organizations involved with this initiative either provided their services at a discounted price or free of cost. As is reflected by an interviewee from a leading telecom operator:

> *"We were not sure in which form we, as a commercial organization, should get associated with such a great initiative. Should it be a profit motive, a CSR (corporate social responsibility) activity or both?[...] At the end we provided it at less than half the usual rates".*

While a newspaper representative claimed:

> *"We always welcome such innovative ideas and try to be associated with such social development projects. [...] We are publishing the course contents free of cost for the last four years which reflects our commitment to social responsibilities".*

Through continuous negotiation with mobile operators and other actors involved, EduCorp increased the number of customers. They achieved this by further decreasing the cost of services while the loyalty of the customers was secured by offering different courses, introducing a mobile and web based assessment system, and issuing an assessment report upon successful completion of courses.

EduCorp went through a series of usability tests (at least 1000 hours altogether) in different phases during the innovation. Even the name of the project was selected based on the customers' feedback. Hence, most of the budget spent for this project was to make the innovation user-centric and to create awareness and build interest among customers. The success of this project has been attributed to this higher level of user involvement and the continuous innovation integrating multiple platforms based on requirement. One of the interviewees explained:

> *"In two years, at least 50 rounds of user testing were conducted. 50 rounds of Focus group discussions and 50 rounds of face to face feedback from the users*

were taken. Every specific issue of the service was identified from hour-long one-to-one discussions with the users. I don't think any organization in Bangladesh does such an extreme level of research. [...] In every stage of the innovation process the users had been involved, even the name "(EduCorp)" was chosen based on users' feedback.

However, these frequent field visits required extensive funds and questions were raised of such visits and their effectiveness by the senior management. Also, due to political unrest and 'Hartal' (i.e., strikes), EduCorp entrepreneurs were struggling to maintain their project schedule at its early stage. Apart from interruption in regular official activities, different events suffered due to frequent changes in the schedule and it created a back log. During 'Hartal', since they wanted to ensure the safety of their employees, they did not compel them to come to the office, as was common among government offices in Bangladesh. They were also reluctant to utilize the weekends to make up for lost 'Hartal' days, as was common in the country, since they wanted their employees to enjoy their weekends, as is well practiced in developed countries. This, in addition to the fact that EduCorp had to follow both the rules and regulations of the donor organization and the UK government for a number of activities (e.g. for advertising in a local newspaper for tendering) created lengthy and difficult timelines for the project. Again, the sustainability of the project had been put into question as EduCorp did not share a single penny of the revenue. An interviewee from a telecom operator claimed:

"Hats off to (EduCorp). They did a splendid job. [...] But (EduCorp) would be a dead horse, unless they change their business model or handover the project to someone else".

Another EduCorp participant added:

"We cannot take share of the revenues as the donor policy does not allow it. But we are still thinking whether we can hand it over to the telecom operator or any other interested party after the project period is over".

Despite this challenge, EduCorp found that their services had begun to be used frequently by customers of other segments of the population. The non-indigenous entrepreneurs were also found to be quite happy with their achievement in the project.

Since they never used mobile phones as a platform in any of their earlier projects, they reported EduCorp as their 'path finder' and mentioned that they were now implementing their learning gained in this project in other projects in India and Nepal.

4.2 Case 2: AgriCorp

In November 2010, AgriCorp launched the first of its kind digital innovation initiative in the agricultural sector of Bangladesh aiming at instant delivery of sugarcane purchase orders to the farmers. This initiative aimed at eliminating the uncertainty of the previous system based on hand-written small papers called "Purjee". A Purjee has a validity of three days. In the event that a farmer receives it late, he fails to supply sugarcanes in time, thus, losing vital income. In extreme cases, this causes a total failure to sell the harvest. Similarly, a "No Cane" situation at the mill yard might arise if Purjee receivers cannot supply canes on the scheduled date due to late notification. In such a case, mills will run under capacity causing significant losses of public resources. Eventually, the farmers start losing their interest to produce sugarcanes and the market is forced to import more sugar.

Considering the extreme importance of Purjee, some staff in the sugar mills used to take advantage of time constraints. Farmers often had to bribe AgriCorp's staff for getting their Purjee on time and even to ensure that their Purjee was not sold illegally to others. In response to such known-to-all, historical challenges, AgriCorp initiated an SMS-based purchase order. This e-Purjee (electronic Purjee) leveraged digital technologies to deliver the appropriate information at the right time to the sugarcane farmers. This simple award-winning SMS-based system turned into a successful Digital Sugarcane Procurement System (DSPS) through a series of innovations that AgriCorp did not envisage at the beginning.

The idea of electronic Purjee (e-Purjee) originated in 2008 by an IT manager of Access to Information (A2I- a government development program). He, along with his team consisting of few computer engineers, undertook the responsibilities of the e-Purjee project, one of the first ever IT projects from the government aiming at "digital Bangladesh". All those engineers used to work in the IT industry for several years and developed many internet-based IS development solutions for affluent desktop users in

the cities, but were not officially associated with AgriCorp. Hence, their experience and practice of developing IS was completely different in nature than what they now faced with the AgriCorp project, where the main users, namely, farmers were computer illiterate. Further, they could not think of an internet-based IS development project without the appropriate digital infrastructure, including internet connectivity. Yet, in the end, they had to overcome these challenges and develop a unique IS solution that was context specific.

They considered using mobile phones as a platform because of their wide usage even in rural areas. However, from the very beginning, the senior managers of AgriCorp were hesitant to initiate such a project, expressing concerns whether the illiterate farmers could be able to use a mobile-based system and accept it. They were also concerned about their lack of computer knowledge and resource limitations. However, as a consequence of the initiator's relentless persuasion, and in alignment with the Bangladesh government's "Quick win" digital service innovation project, senior managers agreed to support the external team. The dominance of the external team in delivering the technology enabled solution is reflected by one of the manager's statement:

> *"The fact is we did almost nothing, we just supported them on what they were doing. Credit should be given to them, they did the whole thing".*

Despite this support, AgriCorp could not start the pilot project in the very first year, because entrepreneurs were faced with enormous internal resistance from a "syndicate" of employees and influential farmers. One of the interviewees told us:

> *"It was a big syndicate. Many of the employees' interests were involved in it. So, it was very difficult for top management to implement such a system".*

Another participant added:

> *"As it was related to their [farmers'] livelihood, they became very concerned and were afraid of what was going to happen. In fact, we, ourselves, were not even that much sure of the impact and output of the system".*

The resistance by the syndicate forced the external team of engineers along with AgriCorp managers to go to the field and start interacting with internal employees,

farmers, and the local communities, in order to explain their idea. It was at this stage that, the non-indigenous entrepreneurs and AgriCorp senior managers realized that some of the farmers did not have mobile phones. One of the interviewees explained:

> *"Most of the farmers or their family members had a mobile phone. We were in dilemma in devising a mechanism to reach those who did not have a mobile".*

In addition to this challenge, even for those farmers that had a mobile phone, because the basic handsets they used did not support Bengali apps and fonts, the system had to send an SMS in English. However, this created an additional challenge, since most farmers were uneducated in English and, thus, could not read the SMS. One of the interviewees told us:

> *"We thought of sending SMS in Bengali, but as the basic handsets did not support Bengali apps and fonts, we had to write the message in English. Otherwise the farmers had to buy new sets which could be nothing but ruining such an innovation".*

To address these challenges, the entrepreneurs trained the farmers' family members or their neighbours (especially school-going kids in those families), who had a mobile phone and who could use the phone on behalf of the farmers. This also helped farmers understand the importance of paying attention to the date and amount of cane to deliver, as noted in the SMS. By the end of 2009, the project was piloted in two sugar mills (Mobarakgonj and Faridpur mills) by the non-indigenous entrepreneurs with the help of internal managers and was successful largely due to the intensive training of the users and the massive promotional campaigns of the digital innovation initiative. The entrepreneurs experimented with how these SMS facilities could be explored in other relevant services. In the course of time, this SMS-based system became a multi-aspect solution, which included notifications about occasional cancellations of cane supply due to a factory breakdown or extreme weather conditions, as well as notifications about payment rescheduling and for farmer's feedback.

Despite these innovations, immediately after the initial implementation, farmers still struggled with the system and often offered bribes to collect the paper copy of their e-Purjee, something which was still a prerequisite to get the payment for the canes

supplied by them. As reported by a senior manager, the entrepreneurial team thought of eliminating the printed Purjee, but this could not be implemented as it would create difficulties in payment systems. Eventually, a web-based Purjee management system was introduced that facilitated e-Purjee receivers to get it printed from a Union Information and Service Center[2] (UISC) located at their vicinity or from any computer connected to the Internet avoiding interaction with dishonest staff. The farmers could utilize the printing facility of UISC at a low cost. An interviewee explained:

> *"[...]. Neither we have the resources to develop the massive infrastructure, nor they (farmers) can buy a computer, printer or an Internet connection. So we had to look for any other way to facilitate the printing of e-Purjee".*

In the meantime, the entrepreneurial team came to an agreement with the government-owned mobile operator Teletalk to provide SMS facilities at a discounted price. They recognized the difficulties in monitoring and managing e-Purjee distribution by the 15 mills scattered throughout the market. Noticing some of the employees taking advantage of the system's limitation, they thought of developing an online dashboard that would instantly update the issuance of e-Purjee, thus facilitating the senior management to observe real-time data on cane production and crushing. AgriCorp's senior managers were initially hesitant to implement such a dashboard, as they lacked available resources (hardware, software, Internet), and internal technical expertise to operate such systems. However, after help from the leading entrepreneurs and having received training on relevant software, the team eventually developed the online dashboard. The dashboard was developed with additional features to provide notifications when an SMS was dispatched from any mill or when a farmer provided feedback. Despite such initiatives, unethical practices in e-Purjee distribution by some AgriCorp employees continued though reduced to a large extent.

The external team with the help of AgriCorp managers and an external software development vendor developed an e-gazette to ensure that the field staff could not manipulate the data collected from surveys conducted each year. This e-gazette helped to calculate the amount of sugarcanes, and the number and date of Purjees to be issued against each farmer, based on a few preset parameters. The farmers were

happy with the innovation as they did not need to bribe AgriCorp staff anymore. One farmer told us:

> *"A simple SMS changed our life. I never thought of getting Purjee sitting at my home".*

Another farmer said:

> *"I could not believe it. We thought it would be another way of getting money from our pockets and we would have to bribe more. […] But now I pray to the Almighty for them who have done it for us".*

Meanwhile, AgriCorp received several national and international awards for the digital innovation and the impact it has created on farmers and their families. Following AgriCorp's success, the external team of entrepreneurs who led the innovation with the support of AgriCorp internal managers later replicated this project in another mill corporation in Bangladesh and reported that their experience in AgriCorp helps them in other similar projects.

5. THEORETICAL ANALYSIS

This section presents our theoretical analysis of the digital entrepreneurship and innovation projects in the two empirical case studies. Appendix 3.A and 3.B illustrate how we categorized our empirical data to identify common themes in EduCorp and AgriCorp. Drawing on liminality, we then examine those themes to show how entrepreneurs in emerging markets go through the phases of separation, transition and incorporation. Focusing on the group of concepts identified from the empirical data relating to the transition phase, we also show how the capabilities of digital technologies enable entrepreneurs to take actions in both cases.

Separation Phase

Our analysis in EduCorp indicates that separation arose as entrepreneurs found themselves outside of their familiar context, which was radically different than the context of innovation. We found that entrepreneurs came from developed countries (UK, USA, Australia, New Zealand etc.) and worked in different projects there. In

those projects the target users exhibited skills and cultural values that were similar to the entrepreneurs. While the entrepreneurs' knowledge and experience in those prior projects proved valuable, when initially applying those in Bangladesh they found that they had to separate themselves from their existing working practices and learn new ones for this market. An interview with one of the entrepreneurs revealed aspects of the separation faced by EduCorp entrepreneurs:

> *"You can't work in the same way in Bangladesh as you worked in (a developed country). There are differences in culture, differences in expectations and skills of the users, engagements are various, capacity of the team is different, dealing with government and private organizations are also different. [...]. You have to change the way of your working style, management approach and also your key considerations, because the context is quite a bit different."*

Another interviewee added:

> *"... they had some preconceived idea which they thought would be applicable for Bangladesh as well. [...] As a medium, radio was their first choice. May be the radio is very popular in [country of donor organization]. Even the initial contents and accents were based on [country of donor organization]. However, they recognized the reality soon that scenario is completely different here".*

As such, the entrepreneurs from EduCorp needed to set aside the practices they adopted in their western-world projects and overcome their cultural influence of developed countries.

Unlike EduCorp, in the AgriCorp case, entrepreneurs did not come from AgriCorp itself. Rather, these were IT specialists and computer engineers from a government project. Similar to EduCorp, however, we observed that those entrepreneurs had to separate themselves from the experience they had in their prior projects for people living in the cities, and also from their existing knowledge, which they acquired from western-world textbooks. While in their prior projects they focused on internet-based IS development for affluent desktop users in the cities, they now had to develop a project for farmers that were computer illiterate and very poor, who lived in an

environment lacking supportive infrastructure. It made them recognize that developing a desktop-based information system would not work in this case. Rather, like in the EduCorp case, entrepreneurs in the AgriCorp case had to separate themselves from their prior project experience and knowledge, and develop new knowledge. This is indicated by one of the entrepreneurs:

> *"I worked for 10 years in the IT industry, but it was quite a different experience. It is not because of its technical difficulties rather how the project progressed. […] Can you imagine- we struggled to start the project for almost two years? And that is because- these people [AgriCorp management] did not know how to use IT and then few corrupted internal employees, their trade union, along with the farmers protested against us. It took a long time to convince them [the users] and start the project. […] It does not conform to any theoretical model, neither what we learnt from academic books will work here. At least for us- it didn't."*

Thus, we can observe how, in both cases, separation from existing practices was important to enable entrepreneurs to begin to explore new opportunities for digital innovation. It is noteworthy to mention that, because EduCorp entrepreneurs were non-indigenous, their separation was more difficult than that felt by AgriCorp entrepreneurs, who were indigenous. Thus, the former lacked knowledge of the context, whereas the latter did not. Still, however, both sets of entrepreneurs were faced with projects that exhibited different characteristics than their past projects, especially the fact that they both had to deal with users that were not used to the digital technologies being proposed.

Transition Phase

Our empirical data shows that, as entrepreneurs in EduCorp and AgriCorp needed to separate themselves from their prior practice of innovation, they found themselves into a phase of transition. We found that due to the contextual challenges inherent in the two projects, entrepreneurs could not exploit their preexistent experience and knowledge of innovation process in this transition phase of digital innovation. The analysis of the EduCorp and AgriCorp cases reveals that during this transition they

experienced *ambiguity, an opportunity to experiment and explore novel ideas,* and *a sense of community*.

We found that EduCorp entrepreneurs experienced a high level of ambiguity from the very beginning of the innovation. An example of such instance is their tension in selecting a technology platform to reach the target population. Even after a survey result where mobile phones were found to be the most preferred technology, entrepreneurs were hesitant to accept it. A tension was also observed in selecting lesson materials and a choice of accents for the audio files. Similarly, the selection of a wide variety of media (e.g., IVR system, mobile SMS, websites for desktop users and mobile users, bilingual game shows and drama serials in television, CD/DVD, books) reflects their ambiguity in their goals, as well as in selecting means to those goals. Ambiguity was also observed as entrepreneurs were trying to maintain a planned project timeframe and avoid political turmoil. Our empirical data shows that the ambiguity arose due to tensions of whether to allow employees to enjoy their weekends (as is well practiced in western-countries) or to utilize weekends to make up for working hours lost due to 'Hartal' (as is well practiced in Bangladesh). They experienced such ambiguity due to a lack of prior knowledge and experience in working in projects, whereby users had a low literacy, low income and the environment lacked a supportive infrastructure.

As in EduCorp, AgriCorp entrepreneurs were similarly faced with ambiguity. While opting for a mobile phone-based SMS as a platform to offer benefits to the farmers, entrepreneurs were faced with ambiguity as to whether the farmers would be able to read SMS. They also faced ambiguity in relation to addressing the needs of the farmers – who did not have mobile phones – to adopt the e-Purjee system. Ambiguity also existed as the entrepreneurs struggled to find ways of making the printed e-Purjee available to the farmers, given the lack of digital infrastructure and Internet connectivity required for printing. Similarly, their hesitation was observed in choosing media that could create awareness, build interest and reduce the negative perception regarding technological solution among the poor farmers.

Our analysis also shows that while faced with ambiguity, EduCorp entrepreneurs got the opportunity to experiment and explore novel ideas to innovate an appropriate

digital solution. For example, as there was tension in choosing mobile phones to teach communicative English, their focus was initially on magazine programmes, bilingual drama series and game shows on television, though mobile initiatives were also introduced. In this case, they chose television and mobile as both had a wide reach in the market. This indicates the digital capability of accessibility of mobile phones, which played a key role in selecting them as a platform. Entrepreneurs also took advantage of the ease of mastery of IVR technology to prioritize IVR service, as users found it was easier for them to follow voice instructions than reading SMS. Another example of experimentation came after entrepreneurs realized the unsuitability of basic handsets in using Bengali fonts, leading to the incorporation of Bengali as 'gif' files into WAP portals. They also developed the first of its kind Unicode supported website for navigation and instruction in the local language, which did not require installation of any additional font into the users' terminal. This shows the reprogrammability, data homogeneity of digital technologies offered the flexibility to design new services (e.g., online assessment, assessment report), while presenting the same data uniformly across devices. As such, while experiencing ambiguity in selecting means to goals, entrepreneurs in EduCorp experimented and undertook different novel initiatives.

Similarly, entrepreneurs in AgriCorp were also found to experiment and explore novel ideas while being immersed into an elongated ambiguous stage. For instance, despite their ambiguity of the non-readability of SMS and of how to reach farmers having no mobile, they deliberately chose mobile phones because of their (mobile phones) accessibility while engaging the farmers' families and neighbours (i.e. school going kids, who could read the SMS on behalf of the farmers). Our analysis shows, once this new service got well accepted by the farmers, AgriCorp entrepreneurs used the same SMS system for cancellation of orders, notification of cancellation of payment, rescheduling of payment and for mobile payments, and user feedback. All of these novel initiatives were possible due to the reprogrammability of mobile phones. Further, when entrepreneurs found that farmers needed to bribe mill staff for collecting paper copies of their e-Purjee, they came up with a novel idea of engaging UISCs. Again, even after incorporating various digital initiatives, the unethical practices of some of the employees emerged as a challenge to monitor and control e-Purjee distribution. Reflecting on this emergent challenge, entrepreneurs developed an

online dash board and piloted an e-gazette system that was not originally envisioned. Data homogenization of digital technologies enabled entrepreneurs to take such novel ideas and to converge it with the prior developed mobile and web-based e-Purjee management system. Though there were risks associated with these initiatives, such deliberate actions by entrepreneurs were almost mandatory, since there was no fully formed practice or canonical solution for deploying new digital technologies. Rather the transition phase gave opportunities to experiment and explore novel ideas.

Finally, our analysis shows that, though EduCorp entrepreneurs went through a phase of separation from their preexistent practices, during the transition phase they were forced to actively engage with diverse actors in the project and achieve a sense of community. This sense of community allowed them to experiment and explore novel ideas as a team to make the project successful. For example, even though they were unable to take any revenue from the project because of being bounded by donor policy, EduCorp entrepreneurs approached mobile operators, newspapers and technical vendors with value proposition towards social development and sustainability. As a consequence, mobile operators, in spite of their usual profit motive as commercial organizations, were convinced to offer a special discounted rate for services. Similarly, the most popular newspaper agreed to publish the course material free of cost while digital publishing houses took only their production costs. Even the technical vendors were found to report this project not as a commercial one for them. Though the engagement of these diverse actors were due to different initiatives undertaken, this sense of community for a developmental project enabled entrepreneurs to ensure an integrated digital service at a low cost so that the target people could use it frequently.

A sense of community was also observed in the AgriCorp case. The initiation and continuity of the innovation was under threat due to the resistance from the employees' trade union in AgriCorp and from influential farmers in the locality. As a result, during this transitory phase, the entrepreneurs formed a team that included a few internal top managers and selected employees that worked separately for this innovation project. The resistance affected the extent to which these actors identified themselves as a separated group (within the organization) having a sense of community with the entrepreneurs and having divided themselves from those who

were protesting the innovation. In support of their initiatives, this group persistently and strategically interacted with different actors (e.g., farmers, farmers' families, local influential people) to disseminate the potential benefits of the new approach and to demonstrate how the long term problems could be resolved using the innovation. These enabled them to withdraw farmers' and local people's support to the AgriCorp trade union. In addition, the sense of community developed within the entrepreneurial team enabled entrepreneurs to position themselves at the periphery of their established practices and knowledge, and to get engaged in experimentation and exploration of novel ideas as innovation unfolded, without which it would not have been possible. For example, the entrepreneurs set up a minimal digital infrastructure in a sugar mill and trained employees and senior management on how to perform server and domain functions, and even how to run a computer for engaging them into new practices. At the same time, those employees and senior management facilitated the entrepreneurs to immerse into the local context, and supported their experiments and novel initiatives during the innovation despite the non-cooperation from the trade union. As such, just like in the EduCorp case, AgriCorp entrepreneurs created a sense of community which enabled them to experiment and explore new ideas.

In summary, our empirical examples illustrate that being unable to adopt the existing knowledge and practice due to contextual differences in emerging markets, entrepreneurs in both AgriCorp and EduCorp, undertook different actions due to their liminal experiences of ambiguity, opportunity to experiment and explore novel idea, and a sense of community during transition. Our analysis shows, as a result of those actions undertaken during transition, an appropriate digital solution emerges for the local contexts.

Incorporation Phase

Our analysis shows the resultant digital solutions for both cases were well contextualized and happily accepted by the users. For example, in EduCorp, mobile and web-based services were quite popular followed by a newspaper and CD/DVD. Our empirical data shows that over 28 million people accessed at least one of the media services (television, mobile SMS or IVR, website or WAP, newspaper, CD/DVD or book), among which around 7 million mobile users and 2.5 million web

users were found to be highly engaged with the service. Our analysis shows, EduCorp entrepreneurs were happy with the success and outcome of the project. We found that, while they came up with a digital solution for the local market, they also learned the process of entrepreneurship for this market. The new learning gained through actions undertaken in transition phase was well recognized by the EduCorp entrepreneurs. They were found confident and happy of what they have learnt from the projects. As reflected by one of the entrepreneurs of the project-

> *"We have never done any mobile based service. It taught us a lot- how to design and position a service in such a market, how to interact and coordinate different groups of partners, how the users can be engaged and many more. […]. Now we do a lot of work with mobile and (EduCorp) is the path finder".*

Our analysis shows that they have even started using their learning in other projects (e.g., for improving family health, building communities' resilience to disasters) in Bangladesh and initiatives in India and Nepal. Key entrepreneurs in this project are now reported to be working in different emerging markets. It may be claimed that as key decision makers in those projects, they would seek to share their learning with new project members through team interactions.

Similar recognition and incorporation of new digital solutions and learning to innovate in this market was also observed in the AgriCorp case. Our analysis shows entrepreneurs in AgriCorp finally innovated a contextualized digital sugarcane procurement system. The incorporated system used mobile phones for different services to farmers, while a desktop-based online system was developed for the internal employees for monitoring and coordinating e-Purjee distribution and other services. As in EduCorp, we observed that the entrepreneurs were happy about the outcome of the project since farmers' were happy since the new technology enabled them to have fewer visits, lower cost and less time needed for services, while corruption in AgriCorp was reduced to a large extent. Our analysis also shows that AgriCorp entrepreneurs got involved into other government projects in the country and reported that their experience in AgriCorp had helped them a lot in their new initiatives. One of the interviewees stated:

> *"… while few village primary school teachers were being trained, we found one teacher who touched the mouse for the first time in her life. We found her*

hands were shaking and she was failing to control it. You won't believe it, she was so afraid that she fainted after a while. [...]. I think mobile is the best option till today since they use it regularly. At least no one will faint like her."

Another participant added-

"It was challenging but a new experience for us. We learned a lot from (AgriCorp). It made us confident. [...] . We are utilizing our experience in (AgriCorp) at the current projects."

These quotes reflect the recognition of learning in the AgriCorp project to innovate digital services for such a market.

6. DISCUSSION: A PROCESS FRAMEWORK

In this section, based on our analysis described above, we first address our research question of how entrepreneurial agency and context co-evolve through digital technology and then outline the research implications of our findings.

The three phases of separation, transition and incorporation have helped us to examine and explain the process of digital entrepreneurship and innovation in emerging markets. Adopting Turner's (1977) concept of liminality, we found that entrepreneurs in emerging markets had to separate themselves from their prior knowledge and experience. This separation was necessary to address the unique contextual challenges in emerging markets. However, in both cases, this separation was neither temporal nor spatial as in the studies by Nicholson et al. (2015) and Wagner et al. (2012), rather it was symbolic (i.e., setting aside existing knowledge and practices) (Howard-Grenville et al., 2011). Our study builds and extends on this idea of symbolic separation, by showing how entrepreneurs are able to recombine new and existing technologies and build new knowledge and experiences in the innovation process.

We found that, during the transition phase, entrepreneurs experienced *ambiguity, an opportunity to experiment and explore novel idea,* and *a sense of community* all of which led to a series of actions. Our findings suggest that, these entrepreneurial

experiences and actions were enabled by data homogenization, reprogrammability, accessibility and ease-of-mastery capabilities of digital technologies. Our analysis of the actions undertaken during transitional phase, identified three new practices for emerging markets (see Appendix 3.C for a summary). We now discuss how those three practices offer a constitutive perspective for digital entrepreneurship and innovation in emerging markets.

The first practice we identified in our analysis of the series of actions undertaken by entrepreneurs is *a conscious adaptation of traditional practice*. As illustrated in our analysis, we found that in both cases, entrepreneurs adapted their traditional practices to the emerging market context while taking advantage of the capabilities of digital technologies (e.g., introducing mobile phones-based IVR and SMS service for teaching English in EduCorp or for sending e-Purjee to break legacy of 80 years' corrupted system in AgriCorp). Entrepreneurs in both cases were found to exploit existing ideas to create others. In this process, while some of the entrepreneurial initiatives modified the contexts, in few cases those contexts shaped how the innovation would unfold. The capabilities of digital technologies shaped this constitution of entrepreneurial agency and context. Firstly, entrepreneurs were found to take advantage of two digital capabilities, namely, accessibility and ease-of-mastery to set the ground for user adoption. Secondly, they used data homogeneity and reprogrammability capabilities to offer novel services, not previously intended for. We found that, in both projects, the same contents were accessed by mobile phone as well as internet connected desktop computers, which represents entrepreneurs' ability to direct resources, while taking advantage of data homogeneity. Similarly, in both cases, the reprogrammable capabilities of digital technologies enabled entrepreneurs to use mobile and desktop computer systems for different purposes. On one hand, through their conscious effort towards adaptive solutions, entrepreneurs were able to shape the contexts in which those very solutions were introduced. On the other hand, the new contexts (after acceptance of new initiatives by the users) offered them new opportunities to adapt their own practices. As such, by embracing an inquisitive mindset, entrepreneurs may continually create new opportunities, while at the same time, exploit existing opportunities by capitalizing on the capabilities of appropriate digital technologies.

The second practice we identified was *synchronizing users' capabilities and contingencies to digital technology*. This practice entailed entrepreneurial actions that reflected the users' capabilities and contingent events in the emerging markets. Despite taking advantage of accessibility and ease of mastery of the deployed technology, a deliberate effort to change the context was not straightforward because of the users' capabilities (e.g., low literacy, lack of technical knowledge, low income). Instead, entrepreneurs were required to undertake additional actions and synchronize their initiatives. In both case studies, those actions were sometimes formal (structured and rule-based) and enabled by the data homogeneity and regprogammability of digital technologies, while in other instances those actions were informal and enabled by human assistance. For example, the development of a Unicode supported Bengali website was an instance of how EduCorp entrepreneurs took a structured formal approach to synchronize users' capabilities. In contrast, engaging school going kids to help farmers read SMS is an informal approach AgriCorp entrepreneurs undertook. Such actions were also found to help adjust contingencies (e.g., to maintain the schedule due to political instability or to avoid resistance of corrupted employees and influential farmers). However, in all instances, the entrepreneurs' primary consideration was to synchronize their initiatives with the users' capabilities and rising contingencies, irrespective of the nature (formal or informal) of the approach. This reflects why entrepreneurs need to be 'conscious' (as in our first identified practice), so that entrepreneurial agency and contexts are mutually co-constituted.

The final practice we identified in our analysis was *fostering a dynamic engagement of collective efforts*. This indicates how entrepreneurs engaged diverse actors into the process at different points in time as they pursued different opportunities. We found that the actors involved ranged from the local community surrounding the innovation project, to government officials, to different private firms and to users, as and whenever entrepreneurs needed. Our analysis shows that, the engagement of some of these actors was stimulated by the convergence of multiple platforms, while taking advantage of the digital capabilities of data homogeneity and reprogrammability. This practice allowed entrepreneurs to accumulate the required resources from different actors to pursue opportunities that they did not originally envisage for. Engagement of different actors at different points in time allowed entrepreneurs to get their support in their initiatives to adapt traditional practice and to achieve synchronization of their

initiatives. It also allowed entrepreneurs to address internal resistance, institutional voids and other resource constraints while pursuing opportunities continually in these markets. As such, the unfolding of the digital innovation process in both cases cannot be attributed to a single individual or organization, rather it emerged as a consequence of fostering a dynamic engagement of diverse actors.

On the basis of these empirical findings, we propose a process framework (Figure 1) for digital entrepreneurship and innovation in emerging markets.
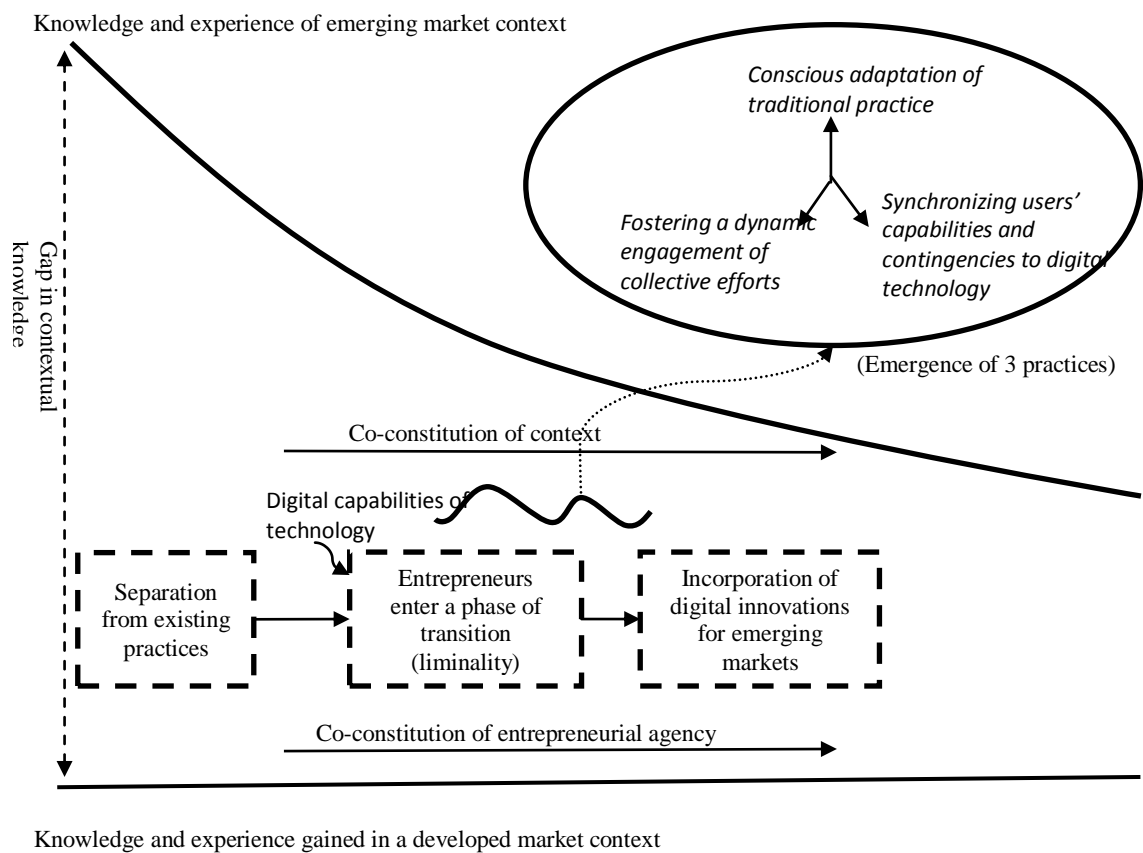
Figure 1: A process framework for co-evolution of entrepreneurial agency and contexts through digital technology

Our proposed process framework illustrates how the dynamic interplay between entrepreneurial agency and context co-evolves through digital technology. Entrepreneurs experience separation because of a gap in contextual knowledge and enter a transition phase or liminality. This liminality induces them to undertake different actions which are enabled by the capabilities of digital technologies. It is during this transition phase that entrepreneurs begin to consciously adapt their

traditional practices, to synchronize their initiatives to users' capabilities and to rising contingencies, and to foster a dynamic engagement of collective efforts. As we show in the analysis of our two case studies, these new practices are not performed sequentially, rather through an iterative process as their agency co-evolves with the context. This co-constitution of agency and context is what eventually leads to the incorporation of new digital innovations to emerging markets.

6.1 Implications for theory and practice

Our findings have several implications for theory and practice. First, the constitutive perspective has only recently been proposed as a useful theoretical scaffolding for understanding entrepreneurship (Garud et al., 2014) and there is limited (if any) research empirically applying this perspective in the context of a digital innovation. However, it has been identified as an insightful perspective for understanding how entrepreneurial agency and context co-evolve in practice, while paying attention at the role of digital technologies in the process (Nambisan, 2016). We build on, and extend, this perspective, by considering the phases that entrepreneurs go through as they separate themselves from existing practices to transition to novel ideas and finally incorporate those into an emerging market context. We also add an explicit conceptualization of the capabilities of digital technologies during the transition from old to new practices. This research is the first to apply the constitutive perspective in a study of digital entrepreneurship and innovation in an emerging market context and to develop a process framework through the analysis.

Second, and in relation to the above, our study complements the emerging digital entrepreneurship literature that suggests digital entrepreneurship practices are inherently socio-material, that is, entrepreneurial practices entail close intermingling with technology capabilities (c.f. Davidson & Vaast, 2010; Nambisan, 2016). By explicitly illustrating how the capabilities of digital technologies inform and transform entrepreneurial agency, while helping the latter shape innovation contexts, this study highlights this inherent sociomateriality. In doing so, we address an empirical void into the emerging literature of digital entrepreneurship (see Nambisan, 2016). In particular, our analysis of the two case studies empirically confirms what Nambisan (2016) has theoretically claimed: that digital technologies have rendered

entrepreneurship less bounded in terms of space and time (e.g. when and where activities are carried out) but also less predefined in terms of the locus of entrepreneurial action (i.e. where the ability to garner entrepreneurial ideas and the resources to develop them is situated) as it increasingly involves a broader, more diverse, and often continuously evolving set of actors. As the two case studies illustrate, entrepreneurship was diffused beyond common boundaries through the use of mobile phones. The reprogrammability and data homogenization of mobile phones enabled a (re-)design of services for a wider and more distributed set of users, while also ensuring the uniform presentation of those services across the same devices. In addition, the two case studies also show how entrepreneurial ideas and relevant resources were accumulated with the help of an evolving set of actors, who utilized the capabilities of digital technologies to contribute to the innovation projects being introduced in Bangladesh. Our study also responds to recent calls for more empirical research on the digital capabilities of mobile phones, as well the use of multiplatform-based digital innovations in emerging markets (Chaudhuri, 2012; Xiao et al., 2013).

Third, our study also offers new insights for digital entrepreneurship and innovation literature in emerging markets by showing that liminality offers opportunities to entrepreneurs to minimize their gap in local knowledge and become creative during the project to offer successful digital innovation in these markets. The IS innovation literature that deals with emerging markets could benefit from a theoretical perspective capable of explaining the dynamic interrelationship of digital entrepreneurship and innovation with its context (Avgerou, 2010; Xiao et al., 2013). Our proposed process framework is an important contribution to the literature (Avgerou, 2008, 2010; Xiao et al., 2013), that shows how a socially embedded digital innovation evolves through a constitutive process of digital entrepreneurship. Our framework demonstrates how entrepreneurs of digital innovation projects in emerging markets experience liminality because of a symbolic separation from existing knowledge and practices (Howard-Grenville et al., 2011). This symbolic separation could be experienced by both indigenous and non-indigenous entrepreneurs as our case study of AgriCorp and EduCorp shows respectively. Thus, although we acknowledge the unique challenges of emerging market contexts, as reported in the literature (e.g. Srinivas & Sutz, 2008; Khanna & Palepu, 2010; Sheth, 2011; Kahle et al., 2013; Ravishankar, 2013), we argue that, what is most important for entrepreneurs

is identifying and addressing the gaps in contextual knowledge. Acknowledging the importance of symbolic separation from existing knowledge and practices will help entrepreneurs go through a faster unlearning/learning cycle and begin to address the unique challenges of emerging markets with equally unique innovations.

The findings of this study also have implications for practice. One of the most important practical implications of this work stems from the role that digital technology can play in influencing economic (i.e. farmer income in the AgriCorp case) and social outcomes (i.e. education in the EduCorp case) in an emerging market. Fostering the rapid socioeconomic development of emerging markets through digital technologies is a key area of focus in the developed world (UNESCO 2002; UN Millennium Project 2005), and almost every year many developed countries make decisions about initiatives in which to invest. The benefits of furthering the socioeconomic development of emerging markets contribute to investment by multinational firms, and increased education levels of the people in the developing country, which in turn can lead to improved healthcare and higher paying jobs available because of increased skills (Venkatesh & Sykes, 2013). Given the success of the two case studies we report in this research, our findings should give policy makers, governments, and multinational corporations the necessary impetus to continue the pursuit of such initiatives. Considering the high ratio of failure of the projects initiated in these markets as reported in the literature (Heeks, 2002; Avgerou, 2010), we believe that the two case studies can be seen as an important contribution to practice for policy makers, NGOs and multinational corporations.

Our study suggests that entrepreneurs must accept the gap in contextual knowledge when entering an emerging market and go through a learning process by which to cultivate new knowledge and to create value from that, instead of being preoccupied with challenges in resource constraints, institutional voids and a user base with a very low income and low literacy as obstacles for successful innovation. The three practices we identify in our analysis, namely, *consciously adapting traditional practices*, *synchronizing initiatives to users' capabilities and to rising contingencies*, and *fostering a dynamic engagement of collective efforts* could help entrepreneurs overcome the liminality faced in emerging markets and achieve successful innovation. Through these practices, they can address any unanticipated 'twist and turns' (Ali &

Bailur, 2007) appearing during the innovation process. An implication for policy makers, in this regard, is that they should provide a supportive political and institutional framework, which would accommodate a dynamic approach of innovations as we have seen in both cases. This would foster a culture of innovation in the firms trying to serve the needs of the poor communities.

The study has few limitations that should be recognized before applying the findings to other situations. Although our empirical analysis aimed at understanding how entrepreneurial agency and contexts co-evolve through digital technology, we can only, with caution, draw inferences and conclusions for Bangladesh. Future research is necessary to examine the generalizability of our work in other countries with similar cultural characteristics and contextual constraints. Another limitation is the duration of the study. Twenty-two-month is perhaps not long enough to fully understand the phenomenon of digital entrepreneurship and innovation, especially in a setting where the use of digital technology has no precedent. Our research focused on users with low literacy and low to no technology understanding. Future research could examine whether our process framework and, in particular, the symbolic separation from existing knowledge is also important in settings where users are literate and have a basic understanding of technology, despite being in an emerging market context. Also, although we offered insights from two separate case studies with two types of entrepreneurs (indigenous and non-indigenous), future longitudinal studies can examine the importance of symbolic separation for indigenous vs non-indigenous entrepreneurs across different types of projects.

NOTES

1. Currency exchange rate 1 GBP= 104.20 BDT; Source: http:// www.xe.com accessed 2nd August, 2017).

2. There are 4516 UISCs operating in 4545 union councils (or union parishads). A union council is the smallest rural administrative and local government unit in Bangladesh.

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CHAPTER FOUR

ICT Driven Transformation of State-owned Enterprises in a Developing Country[1]

ABSTRACT

Extant research has considered the appropriateness of contemporary Enterprise Architecture Management (EAM) to support management of Enterprise Transformation (ET) and recommend context specific EAM approaches. In line with that, drawing on path creation as a theoretical lens, we propose a conceptualization of ICT driven transformation in state-owned enterprises in a developing country as an emerging path creation process. As multifarious challenges are inherent in ICT driven innovations in developing countries, we argue that entrepreneurs – initiators of, or participants in, change –take advantage of these challenges and start to identify options to transform established practices through reflection and experimentation. Hence, ET, in the given context, is not a pre-planned, coordinated approach; rather transformation emerges by "mindful deviation" of the entrepreneurs which can take different paths. We explore these ideas in an ICT driven initiative in Bangladesh for a state-owned enterprise. We discuss theoretical implications in understanding the entrepreneurial process through which ICT driven innovation in developing countries can be successfully transformed creating new paths.

Keywords: ICT driven transformation, Challenges, Developing country, Path creation

1. INTRODUCTION

As Information Technology (IT) has become an increasingly integral component of enterprises (Basole & Demillo, 2006), many studies see it as the key to transformation (Rouse, 2006b). In line with this argument, public enterprises in developing countries[1] have widely used IT to realize its transformational potential for the socio-economic development of their people (Avgerou & Walsham, 2000; Heeks, 2002). Literature shows that, most IT initiatives undertaken in developing countries were merely efforts towards digitization of an existing government process and/or activity and adopted a project approach (see, e.g., Sahay & Walsham, 2006; Madon et al., 2007; Madon et al., 2009). Such an approach, ignores the holistic perspective of Enterprise transformation (ET) (Rouse, 2006b) and results in disconnected and inefficient silos of technology, information and business processes (Basole & Demillo, 2006) for which most of the enterprises fail to encounter the challenges of change in transformation (Rouse, 2005). Consequently, most of the efforts end up in partial or complete failures (Avgerou & Walsham, 2000; Heeks, 2002; Sahay & Avgerou, 2002). In turn, transformation of public enterprises in the context of developing countries deserves special attention.

Enterprise Architecture Management (EAM) is believed to support the management of ET to a large extent (Asfaw et al., 2009; Labusch & Winter, 2013). Despite the holistic approach of EAM to manage the transformational events in an enterprise (Winter et al., 2012; Labusch & Winter, 2013), there is a growing concern of using a contemporary EAM framework for ET (Winter et al., 2012; Labusch et al., 2013; Molnar & Proper, 2013). It is argued that there is no best path or "silver bullet" to succeed in ET (Rouse, 2001; Buran & Chew, 2006; Lahrmann et al., 2010), but rather any approach is dependent on the contingent factors of the transformation context (Baumöl, 2005; Rouse, 2005; Buran & Chew, 2006; Lahrmann et al., 2010). Though the transformation aspects of government organizations have recently received the attention of many researchers (Janssen & Cresswell, 2005; Irani et al., 2007; Dhillon et al., 2008; Van Veenstra et al., 2009; Henningsson & Van Veenstra, 2010), the Information Systems (IS) literature still lacks in knowledge to a large extent, on how a public enterprise in the developing countries can successfully transform.

Following the demand of a context-specific transformation management approach (Baumöl, 2005; Rouse, 2005; Buran & Chew, 2006; Lahrmann et al., 2010), this study seeks to answer the following research question: *"How does a state-owned enterprise in a developing country transform in the context of ICT driven service innovation?"*

We draw on path creation theory (Garud & Karnøe, 2001) to conceptualize ET (Rouse, 2005) as an emergent process. We argue that challenges provide opportunities for entrepreneurs[2] to identify options (Ravishankar, 2013), exert reflection and experimentation (Sturdy, Schwarz, & Spicer, 2006) and create a path (Garud & Karnøe, 2001). Entrepreneurs do this by transforming established practices (Wagner et al., 2013) in terms of the relationships with one or more key constituencies, e.g., customers, employees, suppliers, and investors (Rouse, 2005). We draw on this conceptual framework to explore how a public enterprise engages in enterprise transformation while addressing the challenges of a simple digital service innovation.

The rest of the paper is structured as follows. The next section starts with an in-depth discussion of ET and challenges in public ET. We then focus on the challenges of digitization in developing countries and how it helps to transform a public enterprise linking it to the literature on path creation. This is followed by our research approach and a description and analysis of the case. Finally, the paper ends with a discussion of contributions and outlining implications for theory and practice.

2. LITERATURE REVIEW
2.1 Enterprise transformation and its management

Transformation of an existing enterprise has been recognized as the greatest challenge as it involves fundamental changes dismantling the "as is" enterprise to create the "to be" enterprise (Rouse, 2006a). It "encompasses both broad internal changes in structure, systems, skills and even culture of an enterprise and deep changes in its external links to the environment" (ibid. 15), thus covering overall business strategy, relationships with suppliers, customers and other stakeholders (Hanna, 2010). As a consequence, transformation tends to be a long term process, not a single event or one-time fix (Rouse, 2006c; Hanna, 2010) and significantly differs from the numerous

approaches (e.g., turnaround of business, reengineering of processes, process improvement, Total Quality Management (TQM)) to encounter challenges within the enterprise (Rouse, 2006b; Hanna, 2010).

Recently, many studies indicate that EAM has the potential to support management of such ET (see e.g., Labusch & Winter, 2013; Asfaw et al., 2009; Pulkinen et al., 2007) since EAM not only provides a holistic perspective of an enterprise to its stakeholders (Winter et al., 2012; Labusch et al., 2013), but also serves as a tool enabling better business-IT alignment (Pereira & Sousa, 2005; Molnar & Proper, 2013) through guidance or providing information for coordination (Pulkinen et al., 2007), communication (Asfaw et al., 2009) and decision making (Bernard, 2005). On the contrary, Winter et al. (2012) claimed that EAM and management of ET are different though they possess commonalities. Again, Abraham et al. (2012) state that EAM's performance in coordination is worse than expected. However, in a recent study, Labusch & Winter (2013) identified eight major activity areas for management of ET. They mentioned that in general EAM provides valuable inputs to the management of ET activities but shows weaknesses when it comes to information about individual actors or environmental information, organizational culture, resistances or organizational rituals. Another study shows that appropriate EAM approach depends on the contingent factors of the transformation situation (Lahrmann et al., 2010). Rouse (2006a) mentions that there is no single best model or path to success in ET. Similarly, Buran & Chew (2006) explain that there is no single formula or process; rather, the appropriate approach depends on a particular firm in a particular industry at a particular time.

Consequently, the transformation of a state-owned enterprise in a developing country needs to be understood in its context, since all the well-known barriers for digitization (hence, transformation) in developed countries are not only amplified within developing economies, rather further unique constraints encountered (Heeks, 2002).

2.2 Challenges in ICT-driven transformation

Research in developed countries has identified numerous challenges for transformation in the public sector. Transformation of the public sector is largely

challenged by political pressure (or lack of) (Fernandez & Rainey, 2006; Janssen & Cresswell, 2005), division of cost (Ebrahim & Irani, 2005; Janssen & Cresswell, 2005) and the structure of public sector (Janssen & Cresswell, 2005). Lack of IT governance (Fernandez & Rainey, 2006), lack of skilled IT professionals (Ebrahim & Irani, 2005) and security threats (Ebrahim & Irani, 2005) are also described as impediments of such transformation. Gil- Garcia et al. (2007) identified adoption of a project management approach, lack of implementation guidelines, system complexity and incompatibility as major road blocks for ET while regulation, organizational and people related issues were mentioned by Henningsson & Van Veenstra (2010). In addition, lack of coordination (Ebrahim & Irani, 2005; Janssen & Cresswell, 2005), lack of knowledge about necessary changes and absence of a transformational mindset (Van Veenstra et al., 2009) were also identified as challenges for ET transformation in the public sector.

In the context of developing countries, the list includes more unique challenges for ICT based initiatives. ICT projects in those countries are largely challenged by a lack of power supply (Ovia, 2005), internet connectivity (Thapa & Saebø, 2011), national strategy, legislative regulations and weak ICT policy (English et al., 2011; Latifov & Sahay, 2013). Political challenges like lack of government support and commitment (Bhatnagar, 2000; Sahay & Walsham, 2006; Madon et al., 2009), political instability (Thapa & Saebø, 2011; Silva & Westrup, 2009), lack of alignment within the multiplicity of interests, actors and technologies participating in the projects (English et al., 2011; Thapa & Saebø, 2011; Latifov & Sahay, 2013) along with inadequate financial resources (Best & Kumar, 2008) and over dependence on foreign donors (Odedra-Straub, 1993) are also attributed as major constraints to such initiatives. In addition, entrepreneurs often struggle to incorporate local communities (Puri & Shahay, 2007; Walsham, 2012) in the ICT projects and to build trust by changing those communities' mind set (Braa & Sahay, 2012).

In this paper, we want to explore how entrepreneurs manage such complex challenges without using the standard architecture framework. We argue instead that, the inherent presence of challenges in ET in developing countries facilitate entrepreneurs to combine or blend existing knowledge with emergent ideas; and technological and human resources and create a new path.

2.3 Conceptualizing ET as a path creation process

Path creation has emerged as a powerful theoretical perspective to conceptualize innovation (e.g., Henfridsson et al., 2009; Karnøe & Garud, 2012). This theoretical construct was developed in a reaction to the theory of path dependence used in evolutionary economics (David, 1985; Arthur, 1989). Path dependency, ignoring the firms or actors involved, emphasizes the temporality and dynamic adaptation to random events to understand a technological innovation and its adoption over time. It considers human actors play passive or conservative role with respect to the alternative available in their environment (Boland et al, 2007). On the contrary, path creation emphasizes the active role of entrepreneurs, who deviate from their original intentions to shape paths in real time and create new futures (Garud & Karnøe, 2001). While navigating the complex flow of events, they are fully aware that success and failure are two sides of the same coin (Bijker et al., 1987) and only some of them may create a new path (Garud & Karnøe, 2001). Hence, entrepreneurs can follow a predefined path or create a new path for a successful innovation. In this study, we explore how ET emerges as a path creation process rather following a predefined path to success.

According to Scott & Mark (2006), entrepreneurs in a transformation team must "think out of the box" and challenge the status quo embracing the uncertainty and risks. However, fundamental changes with an organization means changing its "hearts and minds" (Shields, 2006) and such changes encounter powerful resistance from established institutional and social practices (Hanna, 2010). Hence, entrepreneurs of ET cannot exercise unbounded strategic choice due to such embeddedness. So, they are constrained by existing institutional and social practices that they try to overcome (Garud & Karnøe, 2001) while transforming enterprises. We argue that successful entrepreneurs can overcome the challenges associated with ET in developing countries through 'mindful deviation' (Garud & Karnøe, 2001). As Garud & Karnøe (2001: 2) explain:

> *"Mindfulness implies the ability to disembed from existing structures defining relevance and also an ability to mobilize a collective despite resistance and inertia that path creation efforts are likely to encounter".*

ET usually results from a net of collective actions of different communities. Understanding and balancing the concerns, and desires of an enterprise's diverse stakeholders - and finding the "sweet spot" among the many competing interests is really challenging (Rouse, 2006a). Entrepreneurs in ET process are hence involved in transformation of ideas to insiders and outsiders through interactive "translations" (Garud & Karnøe, 2001). Translation helps to create paths by offering a common ground among participants and by helping them to overcome resistance and indifference. As the complex and difficult tasks of transforming an enterprise cannot be done by a single individual or an organization (Buran & Chew, 2006), to succeed in ET, entrepreneurs mobilize others by transferring their ideas to the stakeholders and overcome the challenges like lack of alignment between policy and implementation, resistance to change and other strategic gaps (Karnøe & Garud, 2012).

Buran & Chew (2006: 390) state that "the essence of enterprise transformation is choice and focus". They argue that success of ET largely depends on how entrepreneurs respond to the options confronting them against the defined goals of the transformation. Entrepreneurs in the transformation world re-organize their actions continuously to the needs and opportunities they discover, which might lead towards a new path (Buran & Chew, 2006). Hence, by focusing attention to the phenomena in the making (Garud & Karnøe, 2001), we aim to understand the flow of actions navigated by entrepreneurs in ET over time and explore whether and how it leads to a process of path creation rather than a random or determined outcome.

3. RESEARCH SETTING AND APPROACH
3.1 Research setting

The research setting for this study encompasses an ICT initiative (AgriCorp-pseudonym) in Bangladesh. One of the researchers spent time in Bangladesh investigating this project in two phases from December, 2013 to September, 2014.

AgriCorp is a state-owned enterprise which coordinates 15 sugar mills operating throughout Bangladesh. In 2009, it started offering SMS-based purchase order ("e-Purjee") for sugarcane issued to the sugarcane growers' during its crushing season to

supply a specific amount of cane to a particular sugar mill on a scheduled date. This simple initiative, in turn, by incorporating other services like notification of cancellation of cane supply order or payment rescheduling, web-based e-Purjee printing facility, online dashboard for real time observation of cane production, crushing, e-Purjee distribution and farmers' feedback, eventually, replaced the 80 years' legacy sugarcane procurement system benefitting both the farmers and the sugar mills.

In the choice of the case, our primary interest was to find out a state-owned enterprise which has successfully transformed. We found that AgriCorp has got phenomenal growth of sugarcane procurement (Public documents of AgriCorp, 2013) and the culture of the organization is changing radically due to a series of ICT driven innovations and hence, considered it as our case of study.

3.2 Data collection

Adopting an interpretive approach to data collection (Orlikowski & Baroudi, 1991; Walsham, 1995), we conducted a combination of semi-structured interviews, unstructured interviews, direct observations and document analysis, primarily at AgriCorp, but also at associated organizations (e.g., technical support provider, mobile operators) and for farmers. Semi-structured interviews were used as they have been suggested as an effective tool which facilitates the researcher to fine-tune their inquiry based on respondents' answers, hence, can explore deep insights of the events being investigated (Nandhakumar & Jones, 1997) and it also helps to seek a new angle on the topic being investigated (Kvale, 1996). For the farmers, unstructured interviews were conducted, so that they can talk about their personal experiences openly and freely, and their intimate and emotional disclosures can be noticed (Kvale, 1996) making it a bit informal. In total, nineteen interviews (including follow-up interviews over skype) were conducted over a period of ten months in two phases.

To provide a cross sectional view of the transformation process, we approached interviewees across different levels of management such as the director, the head of MIS department, senior manager, the project coordinator, and senior executives. Follow-up interviews were also carried out for clarification of certain issues of

interest that emerged after processing the data collected initially. Since one of the researchers is bilingual (English and Bengali), the interviewees were offered the flexibility to use English or Bengali. The interviews were conducted at the work place of the interviewees and lasted between 50 to 90 minutes. Most of the interviews were tape recorded and transcribed while written notes were taken for all the interviews. Along with these we had multiple informal discussions over the phone and via Skype. One of the researchers experienced the flow of events in a live setting, while visiting the head office and a sugar mill in Faridpur, and observing the system works. In addition, the researcher conducted five unstructured interviews (in Bengali and lasted for 30 to 45 min.) of farmers registered with that mill and who interact with the system. Finally, we accessed a large volume of archival data including the project plan, survey reports, progress reports, news clippings, company websites, campaign materials (e.g., brochures, posters). The documents were reviewed to get background information on the operation of the project and to verify and confirm the interpretations made through the data analysis process.

3.3 Data analysis

Following Miles and Huberman (1994), interview transcripts, observation notes and other materials were coded (descriptive) to identify and highlight the extract relating to the challenges and the entrepreneurial responses to those challenges during the innovations. In the next stage, inspired by the theoretical perspective of path creation (Garud & Karnøe, 2001), responses observed in the last stage were investigated to look for pattern wherein similar patterns of responses were grouped together into themes (i.e., experimenting and exploration of options in real time, disembedding traditional practice and mobilizing actors through translation). These themes collectively indicate whether the innovation is only a success or a new path has been created by the entrepreneurs. A close observation at the empirical data and paying attention into the theme identified in stage two enabled us to group those themes and conceptualized that transformation (Rouse, 2006a) of a state-owned enterprise as an emergent path creation process. Thus, it was an iterative process to look at the empirical data and relating it with the theoretical framework to explain it.

4. CASE CONTEXT

In November, 2010 AgriCorp launched the first of its kind ICT initiative in the agricultural sector of Bangladesh aiming at instant delivery of sugarcane purchase orders to the farmers reducing the uncertainty of the previous paper-based system based on hand-written small papers called "Purjees". In the event that a farmer receives the purchase order (Purjee) late, he cannot bring his harvest at the right time and fails to supply on due date losing vital income. In extreme cases, this causes a total failure to sell the harvest. Similarly, a "No Cane" situation at the mill yard might arise and mills might run under capacity causing significant losses of public resources if few of the Purjee receivers cannot supply canes on the scheduled date due to late notification. Eventually, the farmers started losing their interest to produce sugarcane and the country was forced to import more sugar. Considering the extreme importance of Purjee, unscrupulous and corrupted staff in the sugar mills took advantage of it and farmers had to bribe staff for getting their Purjee on time and even to ensure that their Purjee was not sold illegally to others. AgriCorp, in response to such known-to-all, long term problems, initiated an SMS-based purchase order e-Purjee (electronic Purjee) leveraging ICTs to deliver the appropriate information at the right time to the sugarcane farmers.

e-Purjee was an initiative undertaken by AgriCorp in 2008 under the umbrella of a "Quick Win" digital service innovation project by the Bangladesh government to directly impact the sugarcane farmer (AgriCorp Public Document, 2013). Following the success of the pilot, in 2010, e-Purjee was implemented in 13 more sugar mills across the country bringing all 15 state-owned sugar mills under this system. Though e-Purjee started by sending SMS only for purchase orders, the SMS-based system became a multi-aspect solution which included notifications about occasional cancellations of cane supply due to factory breakdown or during natural disasters and notifications about payment rescheduling (AgriCorp Public Document, 2013). Showing the SMS to the mill staff, farmers got the right to claim that their e-Purjee had been issued but struggled sometimes to collect the paper copy which was still a prerequisite to get the payment for the canes supplied by them. Hence, as the next initiative, a web-based Purjee management system was introduced by AgriCorp facilitating e-Purjee receivers to get it printed from Union Information and Service

Centers (UISCs) located at their vicinity at a cost of BDT 3[3] or from any computer connected to the Internet. Due to the difficulty of monitoring and managing e-Purjee by the 15 mills in the country, an online dashboard was developed that instantly updated on issuance of e-Purjee, thus facilitating top management to observe the real-time data on cane production and crushing. It also created notifications when an SMS was dispatched from any mill or when a customer provided feedback. Even after such initiatives, corruption of those internal staff and their nepotism in e-Purjee distribution continued though reduced to a large extent. AgriCorp developed and piloted an online gazette to ensure that the field staff could not manipulate the data collected from surveys conducted each year.

The series of innovations have been attributed as reason for which the production of sugar has increased 72.22%, from 62,203 Metric tons in 2009-2010 to 1,07,123 Metric tons in 2012-13, contributing to an improved performance of the nation's sugar industry (AgriCorp Public Document, 2013). It introduced completely a new way to deliver services to the farmers and changed the way AgriCorp along with its other mills were operated. Most of the informants pointed out that the enterprise had to train existing officers, needed technical people and changed the way of day to day activities as well as supervision. One of the senior executives stated that:

> *"It has changed our way of thinking, way of operation. It has lessened our pressure as we need not to run after the corrupted CDAs (field extension workers are known as Cane Development Assistants). The farmers can reach us anytime and we can do as well".*

While a farmer expressed his reaction:

> *"A simple SMS changed our life. I never thought of getting a Purjee sitting at my home".*

Despite these successes, the innovations were not a straight forward process for AgriCorp entrepreneurs. One of the managers claimed:

> *"It was very difficult to adopt such a system in a government organization. It would be easy in a private organization".*

The first hurdle was to identify the appropriate technology that could deliver services

to the farmer. Considering the unavailability of internet facility, frequent power failure, cost of computer hardware and availability of mobile phone among the farmers, AgriCorp chose mobile devices to reach the target group. But the top management faced extreme resistance from internal employees in association with few influential farmers connected with them. As the Ex-director of AgriCorp stated:

> "It was a big syndicate. Many of the employees' interests were involved in it. So, it was very difficult for the top management to implement such a system".

Moreover, the lack of computer literacy of the employees and top management of the sugarcane mills was a constraint to kick off the project, for its smooth operation and for further innovation. As reflected by the statements of the senior manager:

> "Even we did not know what is server, what is domain, how to run computer. […] we were not convinced. He persistently tried to convince us for a long time".

AgriCorp struggled to change the mindset of the farmers regarding technology and to create awareness. The ex-Director of AgriCorp added:

> "As it was related to their [farmers'] livelihood, they became very concerned and were afraid of what is going to happen. In fact, we, ourselves, were not even that much sure of the impact and output of the system".

The entrepreneurs had to overcome the barrier of illiteracy and very low income of the farmer through experimentation. As reflected by the IT manager:

> "We thought of sending SMS in Bengali, but as the basic handsets did not support Bengali apps and fonts, we had to write the message in English. Otherwise the farmers had to buy new sets which could be nothing but ruining such an innovation".

They trained the farmers and adopted below the line advertisements. It did not work at the very outset. It required promotion to the whole community perceiving that at least one kid of each family, or a neighbour who can read English and can be requested to read the message. The barriers have now been overcome but the coordinator claimed: " […] it took a long time and lot of actions to come to this stage".

5. EMPIRICAL FINDINGS AND ANALYSIS

The analysis shows that the entrepreneurial process was continuous and progressive. We see the entrepreneurs take advantage of ambiguity and multiple options provided by challenges. Entrepreneurs were found to consider themselves embedded into traditional and local practices while they tried to depart from them to create a new future. Analyzing the series of responses we could identify certain patterns in the responses to the challenges which took place repeatedly (due to space constraints only one instance has been given in Table 1). By integrating those patterns of responses we come up with three themes (i.e., experimenting and exploration of options in real time, disembedding traditional practice and mobilizing actors through translation). These themes collectively indicate that a new path was created (Garud & Karnøe, 2001) by transforming AgriCorp through series of ICT innovations.

Key Challenges	Responses	Outcome
Selection of appropriate technology	**Theme:** Experimenting and exploring options in real time **Examples:** Choosing mobile to send e-Purjee Using mobile for rescheduling payment, cancellation of order	
Unavailability or weak internet connectivity	Using mobile for customer feedback Developing web-based management system Using UISCs to facilitate hard copies of e-Purjee from web Developing online dashboard to monitor real time e-Purjee	
Frequent power failure	distribution Developing and piloting online gazette	
Resistance from employees	**Theme:** Mobilizing actors through translation **Examples:** Convincing Government and raising fund	**Enterprise Transforms in an emerging path creation process**
Resistance from outsiders	Negotiating with technical service provider Negotiating with mobile operators Negotiating with access to information (a2i, a project by	
Tyranny of corrupted employees	Bangladesh Government) to facilitate e-Purjee printing through UISCs Negotiating with software development firm	
Misrepresentation of collected data by internal employees	**Theme:** Disembedding traditional practice **Examples:** Using ICTs in service delivery despite of illiteracy, poverty, negative mindset of farmers for replacing 80 year old hand to hand delivery Using technologies in organization even in lack of technical know-how of top management, lack of technical staffs and established organizational practices	

Table 1:   *Recognizing ET as an Emerging Path Creation Process*

As indicated in the case, the initial objective of AgriCorp was to send SMS-based

Purjee to the farmers to overcome a known to all problems over the last few decades. Installing the mobile platform for farmers invited new challenges for the entrepreneurs and those challenges offered them new and multiple options to choose while the innovation was in progress. For example, the challenges of poor infrastructure and weak network connectivity were overcome by selecting the mobile platform as the medium, still they had to rely on local computer centres (UISCs), for printing electronic purchase orders (e-Purjee). It was found that the hard copy of the e-Purjee was still a prerequisite and farmers still struggled to collect the paper copy from the unscrupulous CDAs or mill staff and required to often bribe them. This challenge was responded to by developing the web-based Pujree management system which facilitated farmers to print a Purjee issued in favor of them from UISCs located at their vicinity or from any computer connected to internet.

In response to the challenges like the notification of payment rescheduling, order cancellation and to receive feedback from the cane farmers, AgriCorp reutilized its SMS-based service. But monitoring and management of such systems became challenging for the enterprise. As a consequence, an online dashboard had been developed that instantly updated on issuance of e-Purjee and facilitated the top management to observe the real-time data on cane production and crushing; and dispatch and receipt of SMS from the sugar mills for different purpose. Later on they realized that the effectiveness of their innovation depended on the raw data being entered in the system and found it misleading. To address the challenge of manipulation of data by corrupted CDAs, the sugar mill authority planned to introduce an online Gazette system and piloted it.

In addition, AgriCorp was found to struggle with sending English SMS to the illiterate farmers. In response to that they planned to send SMS using the local language (Bengali) which they abandoned considering the fact that new mobile apps might not be compatible to the basic handsets which farmers used and the farmers did not have spare money to buy high-tech phone. Hence, the entrepreneurs had to change and fit in their ideas and plans several times over time to explore options (Garud & Karnøe, 2001) according to needs and opportunities offered by the challenges encountered.

Our analysis shows that when the entrepreneurs in AgriCorp encountered challenges like the resistance of internal employees and influential farmers having connection with the corrupted employees, and the indifference and reluctance of top management and government, they worked as boundary spanners. Taking on such a role they translated and transformed their ideas skillfully to different stakeholders and created a "shared space" mobilizing (Garud & Karnøe, 2001) them for the innovative steps. Even some challenges like the negative mindset of the farmers towards change, their illiteracy and ignorance were responded to by engaging different stakeholders to disseminate the potential benefits of the new approach and to demonstrate how the long term problems could be resolved using the approach, hence building interest in farmers. In this process, AgcriCorp engaged and mobilized the government organizations, a2i, media people, UISCs to reduce resistance, create awareness, and develop desire in farmers to use the system. They were also found to motivate the neighbours of the farmers to assist them by using their mobile handset or helping them read the SMS.

The top management of the sugar mills and the policy makers were initially reluctant to initiate an approach which was far away of the 80 years of traditional work practices within the enterprise. It was observed that the illiterate, poor farmers, who had negative mind set regarding technology, were also against such an initiative. Our data analysis showed that AgriCorp entrepreneurs deliberately positioned themselves at the periphery of these established practices so as to disembed them (Garud & Karnøe, 2001). It took almost two years to kick off the innovation. Hence, challenges in AgriCorp were found offering different actors dispositions to act and transform their own existing competencies (Karnøe & Garud, 2012).

Meanwhile, the series of innovations completely changed AgriCorp's service delivery systems, monitoring and management systems, coordination between AgriCorp and other sugar mills; resulting in the fundamental change of organizational culture and relationships of AgriCorp with its stakeholders. However, since these sorts of fundamental changes within an enterprise encounter strong resistance from established institutional and social practices (Hanna, 2010), so does AgriCorp. Our analysis shows that as a consequence to such resistance, entrepreneurs during transformation could not exercise unbounded strategic choice and tried to overcome it

(Henfridsson & Yoo, 2014). We found that AgriCorp entrepreneurs overcome this resistance by disembedding established practices for which they needed to translate and mobilize others involved in the process. It implies that successful entrepreneurs overcome the resistance associated with ET through disembedding established practices and translating their approaches, hence by 'mindful deviation' (Garud & Karnøe, 2001). Our analysis shows that the journey towards the end, here, was not predesigned, predetermined nor structured. It unfolded as the entrepreneurs explored options while encountered challenges one after another. Hence, such "mindful" exploration of options emerges as a new path in enterprise transformation.

The next section discusses how our empirical findings relate to existing literature and relevant theoretical perspectives to develop a novel understanding of transformation of state-owned enterprises in the context of developing country.

6. DISCUSSION AND IMPLICATIONS

The literature on ET highlights a predesigned and structured style of management for ET. Most of the researchers have focused on contemporary EAM or fine-tuned context specific EAM for successful transformation (e.g., Hauder et al., 2013; Labusch & Winter, 2013; Labusch et al., 2013; Asfaw et al., 2009; Buckl et al., 2010; Lahrmann et al., 2010; Labusch & Winter, 2013). In contrast, our study contributes to the literature of ET management and ICT for development by offering a detailed account of how enterprises successfully transform without adopting such a classical framework. Our analysis suggests that challenges in ICT driven innovations in developing countries offer opportunities to entrepreneurs to look at the innovation process from different angles and, thus, transform an enterprise creating different paths.

We found that top management encountered multifarious challenges and addressed those successfully taking real time decisions to make a path. Though the literature suggests a holistic management approach (Hauder et al., 2013; Labusch & Winter, 2013; Labusch et al., 2013), we argue that the challenges encountered and the flow of actions navigated to address those challenges can be considered as clear and logical steps (Scott & Mark, 2006) which can eventually lead towards the transformation of

an enterprise. Success, thus, depends on how skillful entrepreneurs take advantage of those ambiguous and strategic spaces (Ravishankar, 2013) offered by emerging challenges. Hence, our study shows that ICT driven transformation in a public enterprise is neither a pre-planned, structured sequential process nor an outcome of random events. Rather the complex flow of actions was navigated mindfully by the entrepreneurs leading towards transformation. Our argument in this context is supported by research (e.g., see Basole & Demillo, 2006; Rouse, 2006a) claiming that a company that does not use a standard-based architecture or design can survive transformation but requires complex change processes. Finally, by focusing on the process by which entrepreneurs take advantage of challenges to create new paths, we conceptualize ICT driven transformation in a state-owned enterprise as a flexible modular approach which involves "mindful deviation" leading towards a process of path creation (Garud & Karnøe, 2001) rather than a random or determined outcome.

By conceptualizing ET in developing countries as an emerging path creation process, we complement the recent study by Molnar & Proper (2013) who argue that reflexive actions upon enterprise engineering are adequate enough. However, our study offers a distinctive perspective which shows transformation emerges upon how entrepreneurs deviate "mindfully" and explore available options to create the path. As path creation is always entangled with failure or success (Garud & Karnøe, 2001), such view of transformation as an emerging process accentuates the significance of dynamism of entrepreneurs to navigate the path.

We claim that the rigid and complex EAM framework may not be effective in such emerging process. Instead, most of organizations are found to struggle with the EAM approach if there is unclear goal and unclear demands for EAM team (Hauder et al., 2010). Moreover, lack of expertise and experience in EAM mostly ends up with failure in transformation (Hauder et al., 2010). Given this, we argue that contemporary EAM may not be a suitable approach for state-owned enterprises in the developing country, rather reflexive actions and on demand coordination are more applicable to such enterprises.

7. LIMITATIONS

One of the limitations of this paper is relatively small number of respondents. However, by ensuring the diversity of the interviewees, we tried to increase the sample's representativeness and captured different perspectives of the topic under study. Still, we believe that more in-depth field studies and drawing from other cases could facilitate us to generalize our findings in the context of developing countries.

8. CONCLUSIONS

Focusing on a state-owned enterprise in a developing country, this study provides rich insights into the literature of enterprise management. It unleashes the transformation process of an enterprise which does not adopt classical enterprise framework. We found that the transformation in such context is path creation process which emerges due to reflexive actions of the entrepreneurs encountering multifarious challenges in developing countries. The study suggests that 'mindfulness' of entrepreneurs is a key aspect of emerging transformation process. The study also suggest that rigid EAM framework may not be a suitable tool for management of ET, rather unstructured, non-routine and on-demand management fits well in the developing country context. However, future research could focus on general applicability of our findings in other developing country setting. Moreover, since the emerging process of transformation is mainly guided by the customers, exploration of value co-creation in such setting might be an interesting area for future researches.

NOTES

1. According to World Bank (2004), developing countries are those countries having low or middle Gross National Income (GNI) per capita per year and those with subpar 'economic structure'. Sometimes it is also referred as emerging economies.

2. In this study, the term "entrepreneurs" is used to refer to the individuals, groups or organizations who initiate changes (transformation) or participate in the implementation of those changes(transformation) (Battilana et al., 2009; Henfridsson & Yoo, 2013). Hence, it includes a wider range of actors including the enterprise itself, partner organizations, donors, technical service providers, mobile operators, different media, users and other stakeholders of the whole

transformation process. Thus, while the term "entrepreneur" is a central tenet of institutional theory we are not focused on their inter-relationship in this paper.

3. Currency exchange rate 1 GBP= 125 BDT; Source: http:// www.xe.com (Accessed 20th October, 2014).

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CHAPTER FIVE

Co-creating IT Value in Social-Commercial Alliances

ABSTRACT

Alliances between commercial firms and social enterprises are now a growing trend in efforts to combat endemic societal problems around the world. Given that social-commercial alliances are substantially different from traditional B2B (business-to-business) alliances in many aspects, little is known about why and how commercial firms and social enterprises co-create value through IT in such alliances. Based on our empirical analysis on two successful social-commercial alliances in Bangladesh, we develop four sets of theoretical propositions on the motives of commercial firms and social enterprises to co-create in alliances. We also propose a theoretical model that explains IT value co-creation in social-commercial alliances. While our proposed model shows three modes of co-creation through which participant firms co-create IT value for them, it also explores how a virtuous cycle evolves as firms continue to engage in IT value co-creation by building on earlier cycles. We conceptualize this virtuous cycle as an indirect path to economic value for intangible value co-created and show how co-creation enable participating firms to gain higher value than their preliminary anticipation. We discuss implications of our findings for further research.

Keywords: IT Value, Co-Creation, Social-Commercial Alliance

1. INTRODUCTION

Value co-creation through the cooperation among firms has emerged as an essential strategy in competitive business environments. Commercial firms that seek to be agile and innovative (Grover & Kohli, 2012), are increasingly turning their attention to other firms with which they can work together in partnership and collectively leverage IT to co-create value (Barrett et al., 2011). Co-creation of value entails a robust collaborative relationship among multiple actors in a way that they can create and realize incentives for their mutual benefits (Kohli & Grover, 2008). In the similar vein, the co-created IT value comes from the joint capabilities of co-creating firms where at least one firm contribute IT resources (i.e., technology, expertise or platform) and is unlikely to be created by any of those firms alone (Grover & Kohli, 2012). Hence, the IT value co-created provides a joint competitive advantage for all the firms involved (Rai et al., 2012).

The co-creation of IT value, particularly in the context of inter-firm alliances (Ceccagnoli et al., 2012; Han et al., 2012; Rai et al., 2012l; Sarker et al., 2012), has received increasing attention among IS researchers following a call by Kohli and Grover (2008) to better conceptualize the "value" of IT value research. The value co-creation perspective in other streams of literature mostly focuses on incorporating customers in the innovation process (e.g., Prahalad & Ramaswamy, 2004; Payne et al., 2008; Lusch & Vargo, 2006) with very limited exceptions (e.g., Lambert & Enz, 2012; Barrett et al., 2015), while the attention of IT value co-creation has so far been on B2B perspective. The emerging literature on IT value co-creation does not focus on co-creation in an alliance between social enterprises and commercial firms. Indeed, the extant literature suggests that the alliance outcomes are influenced by the degree to which firms participating in an alliance are homogenous (Han et al., 2012) and argued that conflict of interests among the firms inhibits value co-creation for the participating firms (Sarker et al., 2012). On the other hand, partnerships between social enterprises and commercial firms are inextricably complicated than in B2B alliance (Dacin et al., 2011; Bacq et al., 2013) and have traditionally been seen as adversarial and antagonistic (Argenti, 2004;) which ultimately influence the performance of social ventures negatively (Choi, 2015) leading to small likelihood of alliance success (Sarkar et al., 2009). Still, such alliance is now a growing trend in

efforts to combat endemic societal problems around the world (Reed & Reed, 2009; Vurro et al., 2010). Despite its growing significance, the limited understanding of how co-creation occurs and IT value emanates in an social-commercial alliance warrants a separate investigation of this phenomenon.

First of all, it is argued that a commercial-social alliance emerge when commercial market forces fail to adequately address social problems (Teegan et al., 2004; Austin et al., 2006). Indeed, private firms and business organizations consider social sectors as unprofitable and challenging (Prahalad, 2004; Anderson & Billou, 2007). As a consequence, social problems are left for the government, non-governmental organizations (NGO) and nonprofit organizations (NPO) to address (Prahalad & Hart, 2002; Prahalad, 2004). Nevertheless, recent trends show that local and multinational commercial firms are building partnerships with nonprofit and for-profit social enterprises to develop solutions to social problems (Berger et al., 2004; Reed & Reed, 2009). The inability of single firms to deal with the increasingly complex and risky social problems has stimulated such alliance to form (Berger et al., 2004; Reed & Reed, 2009; Vurro et al., 2010). Moreover, there are some trust related issues from the part of the citizen in relation to whether commercial firms want to help them or make money from them (D'Andrea et al., 2010) while also having increasing pressure to respond to social responsibilities encourage commercial firms to partner (Selsky & Parker, 2005). On the other hand, governments have showed a lack of credibility in their competence, while nonprofit organizations are found to lack adequate resources to solve those mass problems effectively (Selsky & Parker, 2005; Tan & Yoo, 2015; Zahra et al., 2009).

Consequently, forming commercial-social alliance enables individual firms to access required resources and increase their competence and credibility to improve the welfare and living standards of disadvantaged populations, while combating complex intractable social problems (Selsky & Parker, 2005; Vurro et al., 2010). On the other hand, such alliances enable commercial firms to enhance their reputation (Godfrey, 2005; Yaziji & Doh, 2009), provide Corporate Social Responsibility (Sakarya et al., 2012), gain legitimacy (Yaziji & Doh, 2009; Burgos, 2012) and tax rebates (Watson, 2015), penetrate new geographical markets, increase customer loyalty (McElhaney,

2009; Pivato et al., 2008) and eventually expand their customer base (Sakarya et al., 2012).

Despite the need for social alliances between commercial firms and social enterprises, such alliances represent a marriage between opposing values (Zahra et al., 2009) and participant firms have different world view, values (Kourula & Halme, 2008) and cognitive limitation related to how they understand existing network of relationships (Lucea, 2008). Social enterprises' primary goal is social development while commercial firms are in business primarily to pursue profits for owners or stockholders (Diochon & Anderson, 2011; Smith & Woods, 2015). Challenges in social alliances arise because entrepreneurs are confronted with a complex institutional environment, which combines both for-profit and nonprofit logics or both (Dacin et al., 2011). Intricacies may also arise from the pressure created by the diverse motivations of allied partners, differences in their set of skills and organizational culture (Kale & Singh, 2009), the governance structures put together to regulate and control their behavior (Zahra et al., 2009), income earning strategies, scope of activities, innovativeness, or sectoral differences in which they operate (Bacq et al., 2013; Hodge & Greve, 2005). It reflects that when commercial firms engage with social enterprises and seek to co-create, the tensions that arise between the opportunities for joint gains and unilateral exploitation of internal resources (Kohli & Grover, 2008) may be more complicated than in other types of inter-firm alliances due to these diversities (Kale & Singh, 2009; Han et al., 2012; Sarker et al., 2012).

Further to those diverse challenges, deployment of IT as a critical resource in such alliance may offer more opportunities as well as tensions for the firms to co-create, since technological (digital) developments have been argued to overthrow the traditional thinking of partnering and have offered new perspective (Duysters et al., 1999; Nambisan, 2016). Indeed, IT is often considered to be a key interactional tool and enabler of co-creation of IT value (Sarker et al., 2012; Srivastava & Shainesh, 2015). But, IT does not create value for the alliance by itself (Kohli & Grover, 2008), rather to maximize its value creating potential, IT must be integrated in a synergistic manner with both organizational and contextual factors (Wade & Hulland, 2004) and requirement of such integrations may pose more challenges to the social-commercial

alliances that seek to collectively leverage IT to develop joint capabilities (co-create value) for the firms.

In summary, given the rising phenomenon of more social-commercial alliances to address endemic social problems, and that their co-creation process through IT might be more complicated than that for traditional B2B alliances, co-creation of IT value in such social-commercial alliances deserves separate investigation which is of limited understanding. Indeed, there have been recent calls for further empirical research in IT value co-creation (Kohli & Grover 2008), as well as co-creation in social alliances (Austin & Seitanidi 2012a) to produce greater corroborating evidence. Therefore, the research question that we seek to answer in this study is: *how does a social-commercial alliance lead to co-creation of IT value?*

To address this question, we explore the process of IT value co-creation in two successful social enterprise-commercial firm alliances in Bangladesh. One of the alliances, EduCorp, a commercial-social enterprise, introduced an innovative digital multi-platform for educational services. The other alliance FinCorp, a for-profit commercial-social enterprise, developed a digital platform for mobile money transfer services. Based on our empirical findings, we found that by engaging into IT value co-creation through addition, exchange and synergistic integration, commercial firms gain greater economic and intangible value than originally anticipated. We also found that both social enterprises and commercial firms achieve new IT value from the alliance. We assert four sets of theoretical propositions on the motives of commercial firms' and social enterprises' to co-create in an alliance. Drawing upon the in-depth analysis of our two cases, we propose a theoretical model for IT value co-creation in social-commercial alliances that explores how a virtuous cycle evolves as firms continue to engage in IT value co-creation. In addition, we explain the variation in conditions that enable and inhibit co-creation in the two alliances we studied.

The rest of the paper is structured as follows. Following a review of the literature on firms' motivation to engage in social-commercial alliances for an IT venture and on co-creation of IT value, we provide an explanation of how we apply the concept of IT value co-creation in our two case studies. This is followed by our research approach and, a description and analysis of the two cases. Finally, we conclude with a

discussion of our theoretical propositions and our model for IT value co-creation in social-commercial alliances.

2. LITERATURE REVIEW

IT value emanates in alliances between participating firms, which contribute IT resources (i.e., technology, expertise or platform) towards creating, enabling or expanding value for the firms involved (Grover & Kohli, 2012). Following Kohli & Grover (2008), our study examines IT value at the level of the firm or network of firms in a social alliance and views value as both tangible and intangible benefits. In this section, we first review the extant literature on firms' (both commercial and social) motivation to engage in social alliances that may lead to co-creation of IT value.

2.1 Motivations of firms to engage in social-commercial alliances

The failure of governments and private firms to combat endemic societal problems has given rise to social alliances to address public needs for basic services (Zahara et al., 2009; Choi, 2015). A social alliance encompasses any combination of nonprofit and for-profit forms of organizations originating from the private, public and the third sector (i.e., charity organizations, voluntary and community groups, cooperatives etc.) and espouses social and economic goals (Sakarya et al., 2012; Bacq et al., 2013). Even though a nonprofit social alliance aims for social development, the alliance of commercial firms with nonprofit social enterprises creates a complex institutional environment, which combines both for-profit and nonprofit logics (Dacin et al., 2011). Complexities arise not only from the diverse motivations of allied partners but may also arise from income earning strategies, scope of activities, innovativeness, set of skills and organizational culture, governance structure or due to the sectors in which they operate in (Hodge & Greve, 2005; Kale & Singh, 2009; Bacq et al., 2013). However, reconciling diverse goals of creating economic and social value is a potential source of conflict for the alliance emerging from the expectation of social development while operating it as a business (Mair & Marti, 2006; Dacin et al., 2010).

Extant literature on social alliances shows that a participant firm can contribute into

such alliances by bringing tangible resources like money, land, facilities, machinery, supplies, structures, natural resources as well as intangible resources like knowledge, capabilities, management practices, and skills to create more value out of the alliance (Austin & Seitanidi, 2012b). Social enterprises bring marketing and management support (Choi, 2015), their brand, local knowledge and community network into the joint alliance (Austin & Seitanidi, 2012b). Researchers (Drucker (1989; Yaziji & Doh, 2009;) showed that nonprofit enterprises provide legitimacy, awareness of social forces, distinct networks, and different types of knowledge (Murphy et al., 2012), all of which are capabilities that many commercial firms do not possess, but which they seek. Commercial firms collaborate with social enterprises to gain access to new markets (Warner & Sullivan, 2004) and sometimes to gain and maintain the license to operate in those markets (Moser, 2001; Loza, 2004).

Social enterprises engage with commercial firms to access financial resources, augment other required resources, access other corporations, technology and expertise and acquire new knowledge (Yaziji & Doh, 2009; Dahan et al., 2010; Choi, 2015). Social enterprises often have an explicit intention to access the technologies or technical expertise (Brown et al., 2010; Seitanidi, 2010) and network (Yaziji & Doh, 2009) of commercial firms while joining in an alliance with commercial firms. By accessing a commercial firm's technology or technical resources, a social enterprise can develop new digital products or services when appropriately combined with its own complementary resources and capabilities (Bryson et al., 2006). Most importantly, engagement with commercial firms that have IT resources such as specialized hardware, software, and network facilities enable social enterprises to develop their IT capabilities. IT capabilities have been defined as the ability to mobilize and deploy IT-based resources or skills in combination with other resources such as information, finance, and goods to execute inter-firm processes (Rai et al., 2012). IT capabilities have been found to enhance a firm's performance (Quaadgras et al., 2014) through, among others, identifying trends and opportunities, (Im & Rai, 2014), supplying real time customer data (Kohli & Grover, 2008), improving process, providing better customer service (Barua & Mukhopadhyay, 2000), facilitating innovation (Rai et al., 2006) and also managing uncertainty (Benaroch, 2002). Based on these, it can be argued that social enterprises engage with commercial firms to develop IT capabilities so that they can achieve a wider reach, create greater value for

users and expedite required change towards greater social benefits taking leverage of the capabilities developed. Again, since IT (digital technologies) have offered unprecedented opportunities, commercial firms that possess IT as their core resources may join with social enterprises to pool resources from them so that they (commercial firms) can create new opportunities capitalizing the generative nature of IT (digital technologies) (Henfridsson & Byzstad 2013).

In addition to the possibilities of developing IT capabilities, social enterprises are motivated to collaborate with commercial firms when there is a robust business case. Researchers who studied inter-organizational relationships note that an organization enters an alliance if the financial benefits of doing so exceed the costs (Bryson et al., 2006). Traditionally, commercial firms capture financial value because their priority is to maximize profits and revenues for their stakeholders (Burgos, 2012). Therefore, one can reasonably assume that commercial firms' engagement in a social alliance would, prima facie, be conditional on creating sufficient financial value while generating sufficient social value for social enterprises (e.g., Battilana & Dorado, 2010). But their engagement with non-profit social enterprises has mostly been represented as their corporate social responsibility (CSR) or philanthropic commitment (Austin, 2003; Selsky & Parker, 2005). By contrast, their engagement in for-profit alliances is motivated by creating shared value (Porter & Kramer, 2011) that would help them to alleviate a social problem or benefit a low-income market segment, while also creating revenues for the firms (Prahalad, 2004; Halme & Laurila 2009). For instance, commercial firms can take rent or resource fees for the IT resources they are sharing for the development of an IT-based solution aiming at social change. This would incentivize commercial firms by offering financial value, while at the same time, it would enable developing an IT-enabled solution with social enterprises to address a social problem. As such, while IT can create economic value for commercial firms in an alliance by conferring operational efficiencies (Melville et al., 2004), those firms can also yield economic value as a rent sharing their IT resources.

Again, the motivation of commercial firms and social enterprises is often influenced by the industry they are operating in. Firms in an alliance are likely to encounter partners who are also competitors (Grover & Kohli, 2012). This indicates that, when

commercial firms have similar types of IT resources, such as a mobile network, and one of them enters into an alliance to develop IT-enabled products or services, their competitors may feel threatened by the loss of customers' stickiness and increased churn rates. As a result, succumbing to isomorphic pressures (Bryson et al., 2006), competitors ultimately join the alliance to develop similar (IT-enabled) products or services. Through this, firms can gain value as they increase their customers' patronage, enhance customers' loyalty, decrease churn rate and are able to at least maintain their position in the competitive market by offering co-created IT-enabled products or services. On the other hand, social enterprises can leverage increased bargaining power, while also gaining access to an increased customer base once all competitors become partners in the alliance.

Thus, IT as a critical resource in an alliance can create, enable or expand value for the participant firms (Kohli & Devaraj, 2003; Grover & Kohli, 2012) while it also stimulates co-creation developing strong collaborative relationships (Kohli & Grover, 2008).

2.2 Co-creation through IT

While firms can have various motives to engage in an alliance, it has been argued that firms can yield unique value if they engage in co-creation (Kohli & Grover, 2008; Grover & Kohli, 2012). Co-creation is an outcome of strong collaborative relationships (Kohli & Grover, 2008) while at the same time a stimulant of better collaboration between partners in the alliance (Murphy et al, 2012). Prahalad & Ramaswamy (2004) stated that co-creation occurs when firms get "intimately involved in jointly creating value that is unique …" for the firms involved. As such, unlike mere engagement into an alliance, co-creation among two of more firms represents a robust collaboration relationship that emphasize 'personalized interactions'(Prahalad & Ramaswamy 2004) to create and realize unique value that neither of the firms can create of their own (Kohli & Grover, 2008).

In a recent study, Srivastava and Shainesh (2015) explained that value do not arise only from the presence of tangible resources, rather are orchestrated through value creating interactions across the firms. With respect to that, IT (technology) is

considered as a key interactional resource in value-creating relationships (Sarker et al., 2012; Srivastava & Shainesh, 2015). Joint investments in IT enable firms to work together (Grover & Kohli, 2012), while IT supports distributed problem solving (Im & Rai, 2014) and fuels unprecedented growth in inter-firm relationships (Markus & Bui, 2012). Im and Rai (2014) argue that IT can develop shared mental map and promote mutual understanding between partners, at the same time such mutual understating positively impact better customization of IT and develop trust, leading to strong collaborative relationships. As such, when IT is deployed in an alliance, as an interactional resource IT can stimulate strong collaborations, which in combination with other resources can co-create new IT value (Grover & Kohli, 2012). It reflects co-creation may occur when social enterprise in a social-commercial alliance aim to develop IT capabilities combining their complementary resources and capabilities, and as a result, new IT value may emanate. However, though recent studies offered some insights on IT value co-creation in B2B alliances (see for example, Ceccagnoli et al., 2012; Grover and Kohli, 2012; Han et al., 2012; Rai et al., 2012l; Sarker et al., 2012), extant research does not explicitly explain how co-creation occurs and what value emanate when IT resources are deployed as key resources in such a social-commercial alliance.

In the next section, we review the extant literature on IT value co-creation in B2B interactions to establish links with the broader literature on value creation in social alliances. This helps us to develop our initial conceptualization for understanding IT value co-creation in a social-commercial alliance.

2.3 Co-creation of IT value in social-commercial alliances

As discussed earlier, by sharing IT resources, participant firms may co-create new IT value as the unique outcome of their combined resources and joint capabilities (see Grover & Kohli, 2012). The IS literature suggests that co-creation of value through IT emerges from four layers – relationships between assets, knowledge-sharing routines, complementary resources and capabilities, and effective governance (Grover & Kohli, 2012). Again, as suggested by Kohli and Grover, (2008), the co-created IT value can manifest for the firms in the form of direct value or indirect value. Firms may yield direct IT value by increasing ROI, market share, stock price (Kohli & Grover, 2008),

sales, joint profit or stock returns (Stucky et al., 2011) while they yield indirect, intangible IT value by achieving agility, flexibility, first-to-market, better customer service (Kohli & Grover, 2008), reduction of cycle time or reduction of transaction costs, (Stucky et al., 2011). Kohli and Grover (2008) argue that despite those multifarious dimensions, these IT value should, directly or indirectly, lead to economic benefits for firms in an alliance.

Drawing on multifirm B2B alliance, Sarker et al. (2012) suggests that IT value could be co-created through addition, bartering, and/or synergistic integration. Addition happens when one of the partners contributes resources or capabilities in the alliance but value is co-created for both commercial firms and social firms. For example, for a digital product or service, the promotion and marketing can be done by one partner but the value can be co-created for all involved. Sarker et al. (2012) also suggest that an alliance may co-create value when each partner provides resources and competencies that other partners need to provide better products or services. This would be a case of bartering. Finally, firms in social alliance can co-create IT value through synergistic integration as they generate new digital products or services by sharing both complementary and supplementary resources, while partners surrender some of their autonomy and invest in their relationship rather just looking for gains (Sarker et al., 2012).

Grover and Kohli (2012) argue that IT-enabled co-created products, services or capabilities provide conditions and opportunities for further innovation, and innovation is a key driver for value creation (Austin & Seitanidi, 2012a). It is suggested that the creation of one type of value can stimulate co-creation of another type of value and a virtuous circle of value enhancement could be created that may not have been fully forseen before the initial co-creation (Grover & Kohli, 2012). Consequently, we argue that a virtuous cycle that can be created leveraging the co-created IT value may offer economic value to the firms involved and conceptualize it as an indirect path to economic value for intangible IT value co-created. In addition, the virtuous cycle that evolves as a result of offering new products, services or innovations, would attract more customers. As such the firms can leverage the joint investment on IT to avail the externality of benefit and may gain economies of scale. This would be true for commercial firms, while social enterprises would achieve

economies of scope. In addition, through this virtuous cycle, social enterprises may accrue greater social value as it facilitates delivering a (new or existing) service or product to larger number of customers (Austin & Seitanidi, 2012b). As such, being involved in co-creation through IT participating firms in a social-commercial alliance can increase their anticipated value and also gain new value as IT value that either firm is unlikely to create on its own. However, despite its significant potential, many organizations struggle to create value from their IT resources (Devaraj & Kohli, 2003; Quaadgras et al. 2014) since technological resources alone are found not to create value for firms (Devaraj & Kohli, 2003; Dong et al., 2009) rather the magnitude and dimensions are dependent upon different factors (Melville et al., 2004; Quaadgras et al., 2014). Similarly, co-creation may offer new IT value to the firms, but co-creation among the firms is to some extent influenced by several conditions (Sarker et al., 2012) which are discussed below.

2.4 Enabling and inhibiting conditions

Since a social-commercial alliance has disparate partners with diverse motivations, the alignment of their motivations is a prerequisite for value co-creation. Conflicting interests may fuel opportunism, reducing an alliance's ability to create value for all parties (Sarker et al., 2012). Involvement of different types of social enterprises (nonprofit or for-profit) may have great impact on commercial firms' motivation in the alliance and their interaction dynamics in the alliance. Commercial firms which are socially responsible and involved in corporate social responsibility (CSR) activities may find interest congruence with social enterprises' motives, hence the potential of value co-creation increases (Austin & Seitanidi, 2012b). It is often found that social developmental projects that are financially supported by a donor, struggle in the long run. Thus, a donor's intermittent and continued commitment may be an important condition for a social alliance to run for the partners. Similarly, political stability and commitment could be another critical factor for such IT-based value co-creation process. For example, a government's focus or commitment to deliver IT-based services, offering tax rebates for IT-based business might encourage such alliances to form and enable value co-creation. Existing rules and regulation and their continuity, as well as regulatory pressures may be other enabling conditions for continued value co-creation in such social alliances.

It is found that alliance governance mechanisms are also important in value co-creation (Poppo & Zenger, 2002). Sarker et al. (2012) argue contractual agreement is more prevalent in the exchange or additive mode of co-creation while synergistic integration requires trust, goodwill and commitment that lead to self-reinforcing mechanisms. They also found that collective IT capability, simplicity of the technology, adaptability of technology, IT related knowledge transfer and learning all play positive roles in co-creation of IT value. However, it is argued that in the context where technology is deployed, value propositions are not static (Feldman & Horan, 2011). Hence, IT value that emanates in a social alliance may change over time and require alignment or renewal for a sustainable co-creating relationship. Failure to ensure the balance would increase unilateral exploitation of internal resources, instead of opportunities for joint gains being capitalized.

In summary, we try to explore why commercial firms and social enterprises join forces in an IT driven alliance. By drawing on three modes of co-creation, namely, exchange, addition and synergistic integration we seek to examine the collaborative mechanisms by which social enterprises and commercial firms co-create IT value in such an alliance. We argue that co-creation enable partnering firms to yield greater value beyond their anticipation and realization of co-created IT value creates virtuous cycle as an indirect path to economic value for the firms involved. We also explain the differences (if any) in two cases in terms of enabling and constraining conditions. In the next section, we discuss our research setting and methodological approach before presenting analysis of two case studies undertaken in Bangladesh.

3. RESEARCH METHODOLOGY

We use a qualitative case study approach to uncover the motivations of social and commercial enterprises to co-create into the alliance, their collaborative mechanisms, the IT value co-created, and the conditions that enable or inhibit these IT value co-creation processes. Case studies are an important method for theory building (Eisenhardt & Graebner, 2007) and to motivate research questions (Siggelkow, 2007) particularly when the phenomenon is not well-understood. Through case studies, researchers can immerse themselves in the organizational context, identify important

constructs and observe relationships that they can offer as propositions. Such propositions can then become the basis of surveys and other positivist research inquiry.

3.1 Research Setting

The research setting for this study encompasses two successful social initiatives (EduCorp and FinCorp – both pseudonyms) that address problems for the low-income and underserved communities in Bangladesh. EduCorp is the first of its kind multi-platform educational service, which enables millions of adults to learn the English language affordably and conveniently as a route into better paying employment and out of poverty. Using non-conventional tools such as mobile-based interactive voice response (IVR) calls and SMS, television dramas and game shows, along with conventional methods of print-materials, CD/DVDs and Internet-based learning, EduCorp developed the digital service by engaging multiple firms.

FinCorp is the first mobile financial service provider in Bangladesh that facilitates the payment and transfer of funds (BDT[1]) in electronic form via mobile phones without the requirement of customers to have a bank account. Using a partnership approach for implementing this digital service, FinCorp, aims to include the large proportion of the population without access to banking services, especially the low-income masses of Bangladesh, into the financial ecosystem by providing affordable and accessible services. This segment of the population has traditionally incurred high fees by intermediaries from the money transfers. Table 1 summarizes the empirical setting for each case study.

Table 1: Empirical setting		
	Social Alliances	
	EduCorp	**FinCorp**
Partners	Nonprofit social enterprise (EduSE-donor funded) and for-profit commercial firms (6 mobile network operators, a technical vendor-SoftTech (pseudonym), a daily newspaper)	For-profit social enterprise (FinSE) and for-profit commercial firms (5 mobile network operators)
Service sector	Education	Finance

	Implementing ICT based teaching for improving English communication skills of the poor adult so that they can avail better jobs	Implementing financial transactions through mobile phone so that the low income masses are financially included and get benefit of the digital systems
Objective	Implementing ICT based teaching for improving English communication skills of the poor adult so that they can avail better jobs	Implementing financial transactions through mobile phone so that the low income masses are financially included and get benefit of the digital systems
Platform	Multiple (mobile based IVR and SMS, web-based PC, TV, CD)	Single (Mobile)

We selected EduCorp and FinCorp as our research sites because both are successful social alliances that have adopted a collaborative approach to co-creation of IT value, the key phenomenon of our research interest. Both alliances are widely recognized as successful in terms of growth in their customer base. The selection of EduCorp and FinCorp allowed us to investigate why and how their collaborative actions enabled them to develop the digital platform for poor communities while at the same time they co-created value for them. In addition, it was also into our vital consideration that at least one of the partnering firms share their IT resources into the alliance to ensure that IT value can be co-created.

Our research goes beyond a single case study to investigate the variation of motivations and co-creating mechanisms in different social alliances (e.g., how the same commercial firms interact differently while engaging with different social enterprises) and addresses a key concern in previous single-case studies (Austin & Seitanidi, 2012b). We chose two different cases to build a robust theory grounded in varied empirical evidence (Yin, 1994; Eisenhardt & Graebner, 2007).

Finally, while most research on social alliances has been conducted in developed country contexts (e.g., Austin, 2000; Berger et al., 2004), we undertook our study in Bangladesh, where the majority of the population (76.54%) is very poor (World Bank, 2013). Moreover, relative to other markets in Asia and Africa (Kolk et al., 2014), very few studies on social alliances using IT have been conducted in Bangladesh (Warnholz, 2008).

3.2 Data Collection

Our data collection involved a combination of semi-structured interviews,unstructured

interviews for customers, participant observation and document analysis, at the social enterprises and also at partner commercial firms as detailed in Table 2. A total of 46 interviews were carried out, 30 of which were semi-structured and included key representatives of the social and commercial firms while 16 were unstructured interviews of the customers.

Since any sort of collaboration requires mutuality (Sarker & Sahay, 2003), to explore the nature of the collaboration, we conducted interviews with representatives from the firms actively involved in the platform development process (such as the social enterprises, the mobile network operators (MNOs), the technical service providers, media, foreign investor). To provide a cross sectional view of how co-creation of IT value evolved, we approached key actors across different levels of those firms within each case study (Eisenhardt & Graebner, 2007). We then used snowball sampling (Patton, 2002) to identify additional interviewees from different partnering firms as referred by the interviewees of the first two phases. Follow-up interviews were also carried out in the third phase (mostly over skype and phone) for clarification of certain issues of interest that emerged after processing the initial data collected. Collecting data over three phases in three years enabled us to explore changes in collaborative dynamics among the partners, with emerging themes making their way into our longitudinal process analysis (Langley, 1999).

Interviewees were offered the flexibility to conduct interviews in English or Bengali. Generally, interviews lasted between 50-90 minutes. Most interviews were recorded and transcribed. Interviewers also wrote notes for all interviews. Semi-structured interviews were conducted in Bengali, so that the interviewees could share their personal experiences openly and freely (Kvale, 1996). Our selection of alliance customers was based on their availability and was facilitated by a mobile operator for telephone interview in the case of EduCorp, while customers of FinCorp were chosen for an interview randomly when they visited the agents' retail outlets in presence of one of the researchers. One of the researchers availed and experienced both services to observe and understand how customers interacted with each. Finally, we accessed a large volume of archival data including project plans, survey reports, progress reports, news clippings, company websites, campaign materials and published articles. We

reviewed the documents to review background information of the operations, and to verify and confirm our interpretations during the data analysis process.

Table 2: List of Interviews and Data Collected			
		EduCorp	**FinCorp**
Phase one (Four months: June, 2014 – Sept., 2014)	Empirical data	6 interviews, system observation and documentation	6 interviews and documentation
	Participants' profile	• 1 ex-manager of EduSE • 2 senior executives EduSE • 2 representatives from two partner MNOs • 1 representative from media	• 1 senior manager of FinSE • 1 representative from a partner MNO • 1 distributor • 1 agent • 2 customers
Phase two (Three months: July, 2015 – Sept., 2015)	Empirical data	10 interviews and documentation	13 interviews, system observation and documentation
	Participants' profile	• 1 senior manager of EduSE • 1 executive of EduSE • 1 representative from media • 1 representative from SoftTech • 6 users	• 1 senior manager of FinSE • 1 executive of FinSE • 2 managers of the parent bank • 1 senior officer from foreign investor • 8 customers
Phase three (Three months: Aug., 2016 – Oct, 2016)	Empirical data	5 interviews	6 interviews
	Participants' profile	• 1 ex-manager of EduSE • 2 representatives from two partner MNOs • 2 representatives from SoftTech	• 1 manager of FinSE • 1 ex-manager of FinSE who is now a manager of a partner MNO • 4 representatives from four partner MNOs
TOTAL		21 interviews	25 interviews

3.3 Data analysis

Our data collection yielded a large volume of data from interview transcripts, written notes, participant observation, and other documents, and the analysis of those data was carried out in a five-stage, grounded, iterative process. This process was useful as

it enabled us to develop an integrated set of theoretical concepts through successive levels of data analysis and conceptual development from the empirical material (Strauss & Corbin, 1998) as shown in Table 3.

In the first stage, the interviewees' comments concerning the motivations of their organizations' involvement in the partnerships were extracted and compiled separately for each case based on firm types of social enterprise and commercial (Thomas, 2006). Those comments were then aggregated across organizational types and cases. This cross-case analysis enabled us to cluster the motivations based on organizational type and was descriptively coded (Thomas, 2006).

Table 3 : Stages of Data Analysis	
Stages	**Tasks**
1. Identify the motivations for the alliance	• Extract comments concerning motivation to join in alliance • Compilation of comments based on types of organization for each case • Aggregation of comments across cases for each type of organization • Coding motivations descriptively
2. Explore value co-creating mechanisms	• Identifying value creating events and, involvement of partners and resources shared in those events. • Exploring the dynamism that shaped the reciprocal relationships of the partnering firms in the alliance and highlighting relevant interview extracts across cases • Recursive iteration to depict emerging pattern • Identifying value created for participant firms
3. Find interdependence of events	• Examination of the sequence of events into the extracted data • Looking for interdependence into the sequence
4. Seek enabling & inhibiting conditions	• Going back to extracted dataset in stage 2 to discern the conditions that stimulated the events to take place. • Organizing those conditions under three categories
5. Depelop propositions and generate an IT value co-creation	• Develop propositions on firms' motives to co-create from stage 1 to 3 • Build on findings emerging from stages 1 to 4 to examine how IT value is co-created in social-commercial alliance

model	• Compare the new findings with the extant literature of IT value co-creation and social alliance

In the second stage of analysis, we focused on identifying the events in platform developmental process that created value for the alliance partners and the involvement of those partners in such events. We found that value creation in those events, to a large extent, was contingent on the dynamics by which the shared resources were combined in the events. We paid attention to the process by which this dynamism shaped the reciprocal relationships of the partnering firms in the alliance over time. For each case, we spent considerable effort to identify and highlight the interview extracts relating to such value creating events and the collaborating mechanisms of partnering firms' in those events. Following Eisenhardt and Graebner (2007), a recursive iteration between this extracted data set enabled us to find an emerging pattern of three mechanisms for value creation (i.e., creating value for all when each partner shared resources, creating value for all when resources are deployed by one partner and creating value for all through collaborative relationships).

We acknowledged the modes of IT value co-creation identified by Sarker et al. (2012), namely, addition, exchange and synergistic integration, in our own data. At the same time, however, we also found that individual firms created higher value in additional financial benefits and better IT capabilities. This IT co-created value was higher than the initial motivations of collaborating firms. We categorized co-created value into direct and intangible IT value (Kohli & Grover, 2008; Sarker et al., 2012) for each type of organization across the cases. We provide a summary of these value in Table 4 and Table 5.

We then examined the sequence of events into the extracted data to further investigate the interdependence of events that co-created IT value (both direct and intangible). We observed that, in many instances, co-creating relationships and the value creation in one event was influenced to a large extent by value co-created in earlier events. This allowed us to identify a virtuous cycle (Grover & Kohli, 2012) that co-created greater IT value, for instance in economies of scale and scope. Hence, we argue that the virtuous cycle is the indirect path that leads intangible IT value to direct economic value for the engaged firms.

In the fourth stage, we examined the value creating events identified earlier in stage two and sought to discern the conditions that stimulated the events to take place. We organized these conditions under three theoretical categories - alliance governance, alignment of resources and linking interests, and contextual factors - that enable or inhibit IT value co-creation in social alliances.

Finally, we build on the findings emerging from stages 1 to 4 to propose a conceptual model (Figure 1) that illustrates co-creation of IT value in a social-commercial alliance. We then compare the empirical findings against the tenets of existing literature to offer new insights for the literature on IT value co-creation in social-commercial alliances. Next, we present our findings, followed by our analysis and development of the model.

4. EMPIRICAL ANALYSIS AND FINDINGS

Our empirical analysis reveals that in both cases, the development of social-commercial alliances was initiated by social enterprises (EduSE in EduCorp and FinSE in FinCorp) and, as we expected, commercial and social partner firms were motivated to address social problems, albeit at varied degrees. We also found that the partnering firms have diverse motivations to join the alliance.

4.1 Social enterprises' motivations for engaging in a social-commercial alliance

Developing IT capabilities

FinSE participants stated that the primary motivation to engage in an alliance with commercial firms is to access their IT resources (i.e., Unstructured Supplementary Service Data-USSD channel and telecommunication network) to provide the digital money transfer facilities to their customers. By combining their resources with the MNOs' complementary IT resources, FinSE could develop a ubiquitous IT-enabled service, which they could not have done alone. A senior manager of FinSE stated:

> *"Almost every household has a mobile (phone) now. […]. But we needed to have a carrier for the service and approached all the mobile operators to use their network, so that we could enable the end users to get connected with us*

and the server of the bank using their (customers') mobile phone. [...]. ... it (the digital service) addresses a core challenge for the poor, meets their need in their daily activity and they are happy".

This represents FinSE's intention of developing IT capabilities through the alliance so that it could offer services to a larger population. The key objective of FinSE was to address the social problem for poor communities to transfer money to distant places. Similarly, we found that EduSE was motivated to engage to develop an IT-enabled service so that they could offer easily accessible and affordable learning facilities to the poor. One of the EduSE representatives said:

"We thought radio would be our medium of choice since we wanted an easily accessible and also affordable service to offer. But it required changing our decision when we found a high penetration of mobile phones in the country through which we could easily reach our target group".

Again, another EduSE representative mentioned:

"The platform was provided by them [SoftTech]. They also provided us with all the technical support required to develop our service, starting from pilot testing to post launch modification".

EduSE, lacking in those IT resources, was required to develop the intended digital service while partnering with commercial firms (i.e., MNOs and SoftTech) to access their IT resources (MNO's network, SoftTech's IVR platform and IT expertise). Thus, like FinSE, EduSE was also motivated to join commercial firms to develop IT capabilities, which became an integral part of the services offered.

Accessing commercial firm's customer base

Our analysis in both cases reveals that since a customer of MNO is a potential customer for both the social enterprises (EduSE and FinSE), the SEs were motivated to engage all MNOs into the alliance. Despite their intention, in FinCorp, the only MNO engaged initially had around 26% market share then. While two other operators with a market share of 16.8%, and 5.3% respectively joined the alliance soon after, the largest operator with a market share of 44% (28.65 million customers then) took

relatively more time to engage in the alliance. Our empirical data shows FinSE interacted with the MNOs and also sought intervention of the regulatory authority to get the MNOs promptly into the alliance. The negotiation of FinSE with the operators and even with the regulatory body (to put pressure on the MNOs) to engage the rest of the MNOs promptly reflects how keen they were to access the customer base of all the MNOs. As is reflected by a FinSE manager:

> *"It was a big challenge to convince the mobile operators. […] We started with ('X'- a MNO) though we wanted all [operators] on board. […] Bangladesh bank was really helpful to expedite the (engagement) process".*

As a result of the involvement of five dominant MNOs into the alliance, 99% of the mobile customers now can create and access a FinCorp account. Similarly, in EduCorp, when individual MNO wanted to offer the service by themselves, EduSE negotiated with all the MNOs and got help from Bangladesh Telecommunication Regulatory Authority (BTRC) to bring them together to the negotiating table. This shows EduSE's intention to have access to all the mobile customers to their services, something which was not possible unless all MNOs were partners in the alliance.

Financial incentives

Not surprisingly, our analysis shows that as a partner in a for-profit social-commercial alliance, FinSE was motivated by financial incentives from the alliance. Along with its aim of inclusion of the poor into the financial services, FinSE took share of the revenue generated, hence focused on a 'shared value' motive (see Porter and Kramer, 2011). Their financial motivation, besides their primary motivation of societal benefit, was highlighted by all participants. A senior manager of FinSE stated:

> *"If you look at our transaction fees and other charges, you will get an idea of how carefully we have designed it to make them [poor] comfortable with. Even for promotional campaigns, we preferred approaches that can reach the poor communities effectively. […]. Yes, we have a share of the revenue. But, we pay a maximum portion of our revenue to the agents and mobile operators and then a slim share for the equity investors".*

By contrast, EduSE did not have a financial motivation as shared by one of the ex-managers: *"We cannot take share of the revenues as the donor policy does not allow it".*

4.2 Commercial firms' motivations for engaging in a social-commercial alliance

Creating new business opportunities

While SEs in both cases were primarily motivated to develop IT capabilities, our analysis shows that the commercial firms were motivated by potential business opportunities through engagement into the social-commercial alliance. For example, given that the regulation in Bangladesh does not support MNOs to offer e-money transfer services, engagement with the FinSE allowed commercial firms to operate in the market and offer digital money transfer facilities to their customers. One of the MNO representatives claimed:

> *"Yes, they needed us. But for us, it was an opportunity to get involved in mobile money service while we could also exploit our unutilized resources".*

Another MNO participant stated:

> *"We wanted the mobile industry to grow. As a mobile operator, it would eventually increase our business opportunity".*

Similarly, in EduCorp, the participant commercial firms (MNOs and SoftTech) were found to have an interest in capitalizing their unused IT resources through diversification of their services, which they achieved by joining an alliance with EduSE. Like other participants, one of the MNO interviewees highlighted:

> *"We offer different value added services to our customers. To us, it was a VAS (value added service) through which we extended our range of services into the education sector".*

As such, commercial firms, in both cases, were found to seek value through business extension and engage in a social-commercial alliance in search of that value (i.e., potential value due to access to a market, diversification of service, utilization of unused IT resources).

Financial incentives

In the FinCorp case, we found that, commercial firms were primarily motivated by financial incentives. Though the MNOs were concerned of their societal responsibility for the poor and introducing digital money transfer facilities in the country, their motivation towards financial gains were vividly clear as they were found to repetitively interact with FinSE and the regulatory authority for increasing their share of revenue. A manager of the leading MNO stated:

> *"We talked to them [EduSE] several times and also showed our concern to the regulatory authority. It is good for us that the regulatory authority has recently made some changes in the regulation related to sharing transaction fees".*

Our analysis points that, like in the FinCorp, commercial firms in EduCorp were also motivated by financial incentives as they shared their IT resources with EduSE. This is despite the fact that EduCorp was a nonprofit social-commercial alliance. All the MNOs were found to receive revenue per use of the service while SoftTech used to take monthly fees and activity-based payment for their IT resources. A key participant of SoftTech claimed:

> *"Though we charge for our technical support and the platform that we share, we do not focus on profit. […]. Sometimes we offer free services. We feel that we do have responsibilities for our country when [EduSE] being a foreign company is working for our development".*

Similarly, an interviewee of an MNO echoed the MNO representatives' view:

> *"(EduCorp) is not a profit making project for us. We charge them at a discounted rate than the usual market rate. […].You can see that the rate is further discounted as per their request, it is now 0.50 BDT per minute".*

However, their motivation in seeking financial incentives reflect that it was somewhat different than in FinCorp as they were found to offer a discounted rate while sharing their resources or at least did not have the intention to maximize their profit. Hence, commercial firms, irrespective of the profit motives of the social enterprises in both cases, were found to be motivated towards financial incentives to join in the alliance.

Maintaining the position in a competitive market

Our interview data shows that in FinCorp the MNOs did not engage into the alliance at the same time. Rather the alliance in the beginning involved only one MNO that created a potential threat to other MNOs as they were the sole provider of the FinCorp services. Consequently, four other MNOs engaged in the alliance at different points in time to maintain their competitive position in the market. An interviewee from one of the MNOs which joined the alliance later stated:

> *"Our customers had a feeling of deprivation as they wanted the service on their mobile. We felt pressure, pressure of losing the customers. There was even a possibility that customers would start using other MNO's SIM in parallel with ours just to use the service. […] The regulatory authority wanted us to co-operate with them (MNOs) to build up the mobile money system".*

Similarly, in EduCorp, the desire of the MNOs to provide the services only to their customers reflects their motivation to gain a competitive advantage in the market through joining with EduSE into a social-commercial alliance. An EduSE participant claimed:

> *"When we approached them, three of the mobile operators expressed their interest to deliver the service exclusively by themselves for only their customers.[…] It was really challenging to bring them under the same umbrella".*

It indicates that commercial firms have a competitive attitude despite the nature of the alliance.

4.3 Co-creation of IT value

Our analysis demonstrates how IT resources were integral for both alliances and facilitated greater partner interaction leading to co-creation. We find that there were many partners involved in the development of the platform both in EduCorp and FinCorp. For the sake of brevity, we consider only those who actively participated and contributed in the platform development process.

4.3.1 Co-creation of IT value in EduCorp

We found that in EduCorp, the nonprofit social enterprise EduSE procured funds from a donor, while one of the commercial firms, SoftTech, brought an IVR platform, technical expertise, and a content sharing channel in the alliance. At the same time, MNOs shared their mobile network and, knowledge and expertise about the users' preference of service types, handsets and expenditure pattern on value added services (VAS). We found that sharing each other's resources enabled them to interact regularly, leading to collective action without which the development of the platform was not possible.

Our analysis shows that, since EduSE did not have the technical expertise and SoftTech did not have experience on the type of service being offered, to design the service modalities they required regular interaction and consultation with each other from the very beginning. Though designing service modalities and developing the lesson contents were the responsibilities of EduSE, SoftTech still contributed to the relationship by identifying ambiguous or problematic issues in the design. They did this by suggesting changes in the file format of the lessons, correction of erroneous files and modifications in audio quality. For instance, an SoftTech participant claimed:

> *"After dialing 3000, they (EduSE) wanted the users to access module 1 when they pressed 1, module 2 when they pressed 2 and module 3 when they pressed 3, but what if a user pressed 4, 5 or any other digit. (EduSE) asked to disconnect the line in such cases, but we (SoftTech) suggested that they play a voice message indicating that the user has pressed the wrong number and they needed to press a number between 1 to 3 for any (EduCorp) lesson".*

Our observations show high engagement of both parties during piloting and implementation phases, so that the potential digital service was error free and easy to use for the customers. As one EduSE participant explained:

> *"They (SoftTech) integrated the IVR platform with all the MNOs. […] Before a course is offered, we (both organizations) work very closely, sometimes even at one office, to ensure that customers can easily access the service, [and that] it is free of error and any technical difficulty. […] It required extensive level*

of piloting and pre-testing. Initially, the service was accessible by only a few specific numbers configured by SoftTech and was launched for all users once it was found perfect in all levels of testing. Working together we used to test all components of the service rigorously and repetitively to ensure its quality and ease of use".

We found that both parties regularly monitored the platform, as well as other issues related to the service even after the lessons were offered. They jointly inspected whether there were any irregularities with the platform, whether the user interface was working properly and that the courses offered were accessible to all MNO subscribers. By mutual reinforcement throughout the development process, they could combine their resources into "synergistic bundles" (Madhok and Tallman, 1998) to co-create a reliable digital service for their customers.

This improved process yielded value for EduSE by fulfilling its objective to develop an IT capability for customers to access lessons from any place. At the same time, SoftTech exploited its unutilized IT resources by expanding its range of services into the education sector and receiving financial returns in the form of rents. The interaction among partnering firms to integrate complementary resources with IT strengthened their relationship leading to greater mutual commitment and goodwill. Through this collaborative engagement, both parties gained value as they enhanced their skills and learned how to develop a mobile platform service for teaching. A SoftTech interviewee noted:

"To us, it was completely a new idea (using mobile for teaching), in fact for them [EduSE] too. It was quite challenging for both of us at the beginning. […]. After we had started working, we came across a lot of difficulties, even to understand each other's language and preferences. But we became very close over time […]. It was a joint effort, we used to sit together, shared probable solution, went through modification and rigorous testing to bring it into perfection. […]. It works better now, we know what to do and how to do it at the first instance".

Our case analysis reveals that after the integrated platform was developed for the first lesson, the participant firms modified the lesson contents and redesigned the service

modalities in reduced time, by engaging themselves into co-creation through exchange (cf. Sarker et al., 2012). EduSE was found to modify the lesson contents and service modalities of the service offered based on the IVR aggregated data and daily usage reports that SoftTech shared (i.e., phone numbers, location data, usage information). In this process, SoftTech utilized its IT resources to capture and store the IVR data that they shared with EduSE to analyze, and appropriate the service accordingly. As such, co-creation enabled them to develop an IT-based information capability (see Kohli and Grover, 2008) that was beyond their initial motivation and facilitated them to create new value out of this capability. One of the EduSE interviewees stated:

> "*Data provided by them [SoftTech] was something without which we could not be able to redesign and modify the service promptly. Analysing that data we could see how many calls were received and from which numbers, which modules or courses got most hits, when users were dropping off or slowing down, whether they were experiencing any difficulties with content or facing any technical problems and many more*".

The co-created new capability allowed EduSE to interact directly with customers and to quickly get their feedback, preferences and requirements. As a consequence, the partnering firms became agile (a new IT value) to design the service more appropriately and promptly as per customers' expectation and preferences. Again, as a result of co-creation, SoftTech could exploit its unutilized resources and received unanticipated payments every time they shared data and reports. They also extracted value from enhanced learning of how and which customers' usage data could be utilized to develop customer centric digital services which they could utilize in other commercial projects. A SoftTech representative said:

> "*We never used this mechanism. None of our clients asked us to do so. We have learned from them how customer data can be used to design a customer centric service. […]. It will help us in other commercial projects*".

Our interview data highlights that market research, content development and promotional campaigns were mainly conducted by EduSE but value was co-created for other partners like MNOs and SoftTech. These partners did not have to invest in building a sales force or research team to gain this value. This represents co-creation

of value through addition (Sarker et al., 2012). We found that every use of the digital service generates financial incentives for the MNOs. It also creates intangible value for those MNOs as each use of the service, increases the legitimacy of that service, which in turn boosts up MNOs' core business. Like the two previous participants, the importance of this value is stated by a MNO representative:

> *"EduCorp is a VAS (value added service) in our portfolio. [….] VAS is designed to target a specific customer segment and is expected to increase their (target customers') loyalty. And you know, a loyal customer is always an asset for our main business.[…]. We did not measure it, but we think (EduCorp) does the same".*

On the other hand, EduSE yielded social value for every use of the digital service (cf. Austin and Seitanidi, 2012b). Every single use of the service is perceived to be an indicator of attitudinal change of customers towards learning English. Additionally, the customers' usage data provides insights to EduCorp for service redesigning or further development of the digital service offered, thus creating more value through learning. As an executive of EduSE stated:

> *"Increase in number of users encouraged us, made us more enthusiastic. Every single user counts. When someone uses our service, we felt, to some extent, we have changed one's negative perception about English. ... skill development is the next step. […]. Even it was also valuable for us to find out why a customer could not press an appropriate number or dropped the call before a lesson is over".*

Similarly, we observed co-creation through addition while commercial firms like MNOs and SoftTech contributed to the alliance through a digital campaign wherein EduSE did not have to invest but value was co-created for all. MNOs used to send an end-of-call notification (a SMS sent after each call is terminated) to a segment of young customers twice a month at their suitable time specially after meeting their own commercial target and at free of cost. A manager of a MNO explained:

> *"Initially, we used to campaign through an end-of-call (EoC) notification for two times a month, then once a month. […] They did not have any specific time requirement; they were open and quite flexible. Moreover, it was a service offered free of charge. […] It did not cost us, we used to do it usually*

after we had met our monthly commercial targets. It gave us a good feeling as we were doing something for the development of the young generation of our country".

Similarly, SoftTech once provided free IVR call-based promotion to potential customers. In both instances, user profile was only available with the MNOs and SoftTech. By offering free promotional campaigns for a social cause, the commercial firms acted altruistically while exploiting unutilized resources. At the same time, intangible IT value of agility was co-created for EduSE as MNOs added their ability to reach targeted customers directly through mobile communication that EduSE could not have done alone. While EduSE was responsible for promotion and advertisement, these instances of contribution for promotional campaign from MNOs and SoftTech, represented their commitment and trust in the relationship and how new intangible value (e.g., agility, altruism) was being co-created for them through addition.

MNOs received a fee as a financial incentive for each use of the service for sharing their core channel. But they offered this resource to EduSE at a discounted rate (at BDT 0.5/minute while the commercial rate is BDT 2/min) whereby they could create altruistic value for resources that would have gone unused otherwise. It is found that the reduced rate of the core resources decreased the cost of the service and enabled EduSE to offer the service at a lower price to the customers. Consequently, EduSE received intangible value of increased legitimacy by attracting a large number of customers within a short span of time, which they could not have achieved alone so rapidly. On the other hand, MNOs were incentivized as the large number of customers created more financial value.   As claimed by a senior executive of EduSE:

"By lowering the call rate per minute further we could attract a large number of users within a short time. [...].We do not take a single penny [...]. It was possible as the MNOs responded to our request positively, they just charged .50 BDT while the market rate is quite high".

Our empirical data reveals that since its scale-up in 2008, EduCorp co-created multiple lesson series incorporating various innovative features over time. Moreover, apart from its most popular mobile platform, EduCorp adopted multiple media including TV, web, printed and online newspaper, community radio, CD/DVD and a

printed book to offer flexibility and convenience to its customers. For example, while they published the course contents online and in a daily newspaper, this commercial firm acted altruistically by publishing those contents free of cost, thus enhancing its reputation for being associated with EduSE. In addition, it also accrued value as the newspaper's readership is perceived to have increased. Once their relationship was developed, EduSE being the content provider for the daily newspaper and its online version, used to design and format those contents on behalf of the newspaper for which the newspaper is usually responsible. A participant from a newspaper explained:

> *"[...]. It is our responsibility but they have learned it very well over the time we worked together. We are happy that they can do it perfectly and have reduced our workload".*

These findings reflect the collaborative relationship among the partners that they maintained throughout the process to harness their shared resources in unison. The motivations, IT value co-created and the enabling/inhibiting conditions for co-creation in nonprofit social-commercial alliances are all summarized in Table 4 below.

Table 4: Co-creation of IT Value in Nonprofit Social Alliances (Nonprofit SE- Commercial firm)				
Project	Motives for SE	Motives for CF	Co-created Value	Conditions
EduCorp	Developing IT capabilities Taking leverage of each commercial firm's customer base	Opportunity creation (increased use of IT resources in diverse services) Financial incentives - monthly fees, revenue per transaction Maintaining position in the competitive market	**For Commercial Firms (CF):** Direct IT Value (Kohli & Grover, 2008; Sarker et al., 2012): Additional financial benefits; economies of scale. Intangible IT Value (Kohli & Grover, 2008; Sarker et al., 2012): More expanded business; competitive position in market. **For nonprofit Social Enterprises (SE):** Direct IT Value (Kohli & Grover, 2008; Sarker et al., 2012): Economies of scope. Intangible IT Value (Kohli a&	<u>Alignment of resources and interests</u> Alignment of IT resources with complementary resources; compatibility of resources; mutuality of interest. <u>Contextual forces</u> Donor's commitment and intermittent support; government's favorable commitment.

			Grover, 2008; Sarker et al., 2012): More Improved service process; larger pool of potential customers; improved reputation in global development sector; knowledge for future social projects. **For Alliance:** Intangible IT Value (Kohli & Grover, 2008; Sarker et al., 2012): Learning; agility; reduced cycle time; enhanced legitimacy; faster to market; greater social value	Alliance governance Nonprofit motive of SE

4.3.2 Co-creation of IT value in FinCorp

Our empirical data shows that FinSE brought financial investment through the IFC and the Bill & Melinda Gates foundation and BRAC. They also brought other resources for market research, MFS platform design (outsourced from a vendor) and a promotional campaign into the alliance. The MNOs contributed their core network and USSD channel into the alliance. Appropriate combination of these resources allowed the alliance to offer digital money transfer facilities to the lower income group, while at the same time, generating value for the partnering firms. Our analysis shows that initially, the technical integration of the MFS platform with the network connectivity did not require intensive collective efforts. But this simple integration did not create value for the firms rather value emanated from the co-creation process which started while the alliance partners actively engaged in promotional campaigns of the new service and continued thereafter. Our data shows that agent outlets of the MNO that joined first with FinSE were used for customer acquisition, providing technical support and facilitating money transfer facilities, while representing MNO's involvement in promotional activities. Though FinSE was accountable for promotion and advertisement, the MNO was highly engaged in devising promotional strategies and implementation of those. As stated by one of the MNO participants:

> *"We were the only partner then. They used to share their idea and work*
> *closely with us. […]. Initially, our agents' outlet were used for the service, we*

shared the billboards, TVC and offered our suggestions while (FinCorp) was introduced in the market".

This shows the MNO's goodwill and commitment in the relationship. This engagement allowed the MNO to get the license to provide MFS services that they could not have done alone due to a regulatory restriction, while utilizing their unused resources for business expansion. Similarly, FinSE accomplished the primary motive of developing the IT capability to transfer e-money from one mobile to another, hence, improving the service process.

Like EduCorp, firms in the FinCorp alliance were also found to be involved in co-creation and yield value through exchange as they shared their complementary capabilities to protect their customers from fraudulent activities. For example, when a 'SIM lost and replacement' request is found, MNOs share the relevant information of that SIM with FinSE so that FinSE can instantly, temporarily block the FinCorp account associated with that particular SIM. These integrated activities enabled them to protect a customer's e-wallet from possible frauds. As such, co-creation enabled FinSE to develop better IT capabilities (improved IT security) to secure the e-wallet and MNOs to exploit more of their resources. The participant firms gained value from this improved process as they enhanced legitimacy by increasing loyalty of their respective customers.

An interviewee from FinSE noted:

> *"It was a big hassle for the customers and also for us, when a (FinCorp) account was hacked. They used to lose money and come to us, sometimes to the MNOs and we had to put a lot of effort and time to convince them that it's not our fault rather they are responsible for sharing their password. [...]. We are really glad that we have devised a mechanism to fight those frauds. It is a joint effort. [...]. ... they are quite happy that their money is safe. It gives them confidence to store e-money".*

Our analysis shows that value was also co-created in FinCorp through addition since one of the partnering firms contributed with resources but value was co-created for the other partners too. Four of the MNOs have an online shopping portal

incorporating FinCorp which allows customers of a particular MNO to pay for the services or products purchased using a FinCorp account. This yields value for FinSE from increased legitimacy as MNO customers are prompted to use or create a FinCorp account. A MNO interviewee pointed it out as: *"…, doing so, we add value for them"*. Similarly, providing convenience (better customer service) to its customers through e-payment facilities for purchase in their portals and air-time top-up, a MNO enhances legitimacy and maintains a competitive position in the market. It also offers financial incentives to both FinSE and MNOs as both partners get a share of the revenue once a transaction takes place. These instances reflect how value is co-created by layering MNO's ability to attract potential customers to FinCorp services in order to develop value for both sides. Again, FinCorp promotes those partners through their websites by incorporating their association with diverse services and by offering MNOs better exposure. Promoting each other from their own capacity represents their mutual understanding and commitment in the relationship.

Like in the EduCorp case, the distributor, retailers, and promotional campaigns for FinCorp were managed and run by the social enterprise itself after initial co-creation and MNOs did not have to deploy any sales force or resources for it. Still, every transaction created financial value for both MNOs and FinSE. FinSE, gained learning-based value through the development of the distributor and retailers' network and campaigning strategies to acquire a huge number of customers. MNOs also increased their legitimacy as they gained loyalty from the convenience they provided to their customers. One of the MNO representatives explained:

> *"If you have a (FinCorp) account with your mobile number and you are transacting, you obviously would not want to change your number. […]. It helps us to reduce the churn rate and make our core business healthy"*.

For all these instances, the value co-created could not have been created by any of the partners alone, though the resources in these instances are contributed by either of the firms. Co-creation also occurred in FinCorp when FinSE were provided with bulk SMS capacity by MNOs so that they (MNOs) could enjoy flexibility to digitally promote existing and new services such as salary disbursement to their corporate customers. Through this, MNOs could exploit more of their unutilized resources and get additional financial incentives, while FinSE developed IT capabilities to directly

communicate with targeted customers. Similarly, FinSE was found to discuss their novel ideas with MNOs even though FinSE was given the autonomy to introduce a new service into the market while they could also remove an existing one. As such, this autonomy and flexibility offered to each other enabled the partners to foster a collaborative spirit. Further, the developed IT capabilities and learning of FinSE enabled them to introduce a multifarious offering for different segments of the society while revolutionizing the payment system in the country.

While scaling up the services to diverse segments, we observed a mode of co-creation through addition, since negotiation and bargaining with different parties like merchants, hospitals, corporate offices, universities, schools for new service designing was done by FinSE. But, the successful scaling co-created value for both FinSE and MNOs. None of the alliance partners could generate such value with their own resources alone, rather value was co-created mostly through addition and exchange, and also in few instances through synergistic integration (Sarker et al., 2012). Table 5 below summarizes the motivations, the IT value co-created and enabling/inhibiting conditions for co-creation in for-profit social-commercial alliance.

Table 5: Co-creation of IT Value in For-profit Social Alliance (For-profit SE- Commercial firm)				
Project	Motives for SE	Motives for CF	Co-created IT Value	Conditions
FinCorp	Developing IT capabilities Financial Incentives Taking leverage of each commercial firm's customer base	Opportunity Creation: (Exploit unutilized IT resources to operate into a potentially accessible market) Financial incentives (Revenue per transaction) Maintaining position in the competitive market	**For CF:** Direct IT Value (Kohli & Grover, 2008; Sarker et al., 2012): Additional financial benefits; economies of scale. Intangible IT Value (Kohli & Grover, 2008; Sarker et al., 2012): More expanded business; competitive position in market. **For for-profit SE:** Direct IT Value (Kohli & Grover, 2008; Sarker et al., 2012): Financial benefits; economies of scale and	Alignment of resources and interests: Alignment of IT resources with complementary resources; compatibility of resources; mutuality of interest. Contextual forces: Regulatory pressure; perceived societal pressure; government's favorable commitment. Alliance

			scope.	governance: Profit motive of SE; value renewal/ adjustment.
			Intangible IT Value (Kohli & Grover, 2008; Sarker et al., 2012): More Improved service process; larger pool of potential customers; learning.	
			For Alliance: Intangible IT Value (Kohli & Grover, 2008; Sarker et al., 2012): Agility; enhanced legitimacy; faster to market; greater social value	

4.4 Virtuous cycle of value co-creation: An indirect path to economic value

Our analysis in this section explores how a virtuous cycle of value co-creation evolves as firms in the alliances continued their co-creating relationships and realized the co-created value. We also show the virtuous cycle as an indirect path to economic value for the intangible IT value co-created in alliances.

In our prior analysis for EduCorp we showed how, as the firms co-created the integrated mobile based platform to launch its first lessons, they started gaining value from process improvements, financial benefits, better position in the market and increased legitimacy. At the same time, due to their high engagement and frequent interaction, the co-creating firms increased their mutual learning and motivated them to improve the process further by co-creating new IT capabilities (e.g., information capability to analyze captured IVR data). This new and enhanced IT capability offered value to the co-creating firms in the form of agility through improvement of their decision making capability for faster modification and redesign of the service. At the same time, this virtuous cycle enhanced their capability of better identifying their customers' needs through a targeted feedback system such as holding mobile conversations with users. The significance of learning and the agility achieved was highlighted by a senior manager as:

> "We learned at every step ... learning at one step made our journey easier in
> the next step. [...]. As time went on, we needed less modification, we became

quick in development, quick in response and became confident that yes it is possible".

Again, it motivated the alliance for further co-creation as it incentivized SoftTech with additional financial benefit and EduSE with a more improved process, which shows possibility of potential higher value outcome. Consequently, the alliance co-created a new digital module named 'EduCorp' Amar Engreji Course - 'EduCorp My English Course' with innovative features that allowed users to customize their learning and facilitated self-assessment. While the improved IT capabilities facilitated them to co-create these new customer centric lessons within a short time span, the learning that took place at earlier stages enabled them to minimize possible difficulties with redesigning the new lessons. As such, learning and agility gained during one co-creation cycle enabled EduCorp to offer faster and error-free customer centric digital courses in the next cycle reducing innovation cycle time. Thus, the alliance achieved faster to market cycles (Kohli and Grover, 2008) and a faster innovation capability (Stucky et al., 2011).

Moreover, after the initial co-creation cycle (i.e., after the first course was offered to the market), the legitimacy achieved from a large number of customers' acceptance of the digital services influenced (at least to some extent) EduSE to introduce new services. An ex-manager of EduSE stated:

> *"We got huge [positive] response after we have launched it. I remember the server crashed on the first weekend after we launched it. It was Friday and we had to work at the office. It was painful but so encouraging. [...]. To be honest, it was beyond our expectation and their overwhelming response always motivated us to do something better, something more for them".*

In turn, it offered a better (or at least stable) market position for the MNOs and greater social value for EduSE by increasing their legitimacy. In addition, commercial firms were able to fulfill their altruistic commitment through the large number of customers' access to the service by offering a discounted rate for their IT functionality. As such, higher value was yielded by the firms at each cycle (every time a course/ service was offered) due to their successful collaborative mechanism. As higher value stimulates stronger collaboration (Austin & Seitanidi, 2012a) and mutual

trust (Bettencourt et al., 2002), firms in the alliance are motivated to continue their reciprocal relationship and engage in further value co-creating activities. Consequently, a virtuous cycle of value co-creation emerges wherein realization of co-created value for one service, facilitated the alliance partners to deliver new or improved lessons and service for further value expansion.

We found that through this virtuous cycle, EduCorp attracted customers who were either highly engaged (around 10 million) or had accessed those courses at least once (around 28 million) over time. As every single use of the service incentivized commercial firms financially, the increased number of customers reimbursed their discounted rate, thus yielding economies of scale. A MNO representative noted:

> "We offered a discounted rate but the large number of customers compensates it. However it is not our profit making project".

Again, the virtuous cycle offered economies of scope for EduSE as the cost of offering different courses and services was lowered once the platform was developed. As such, for the partners engaged in the alliance, the virtuous cycle evolved as an indirect path to economic value, which was created while realizing the intangible IT value of agility, learning, and faster to market co-created in each cycle. As the virtuous cycle created a larger customer base, EduSE accrued greater social value by improving English communication skills (8.8 million users stated that they have learnt English, 7.7 million use what they have learnt), or at least changing a large number of customers' attitude towards English (48% of users expressed greater motivation to learn English while 42% were found to have increased confidence in English). Similarly, EduSE perceived that their reputation in the global development sector has improved, while at the same time, they acquired knowledge of how such an IT-enabled development project can be successfully implemented for societal benefit. As claimed by a senior manager of EduSE:

> "We have never done any mobile based service. It taught us a lot- how to design and position a service in such a market, how to interact and coordinate different groups of partners, how the users can be engaged and many more. […]. Now we do a lot of work with mobile and (EduCorp) is the path finder".

As in EduCorp, our analysis shows that a virtuous cycle is also created for FinCorp as

the partners continued their relationship and involved into further co-creating activities realizing value co-created in each cycle. In this case, the agility achieved through developed IT capabilities and legitimacy gained in one stage of co-creation offered further opportunity to create value. Their joined capabilities were utilized to co-create more value (e.g., fraud detection, digital campaign). All partners in FinCorp were found to achieve economies of scale as the digital money transfer facility was scaled at different sectors over time. For example, apart from e-money transfers, thousands of merchants accepted the FinCorp payment method; many corporate offices disbursed salaries to their employees' FinCorp accounts; tuition fees at different schools and universities were received via FinCorp; and service fees at hospitals can now be paid using FinCorp. FinCorp also introduced an interest based deposit scheme for their customers, as well as cash deposit and withdrawal facilities from ATM to a FinCorp account. As a transaction takes place, a small amount of revenue is generated for FinSE and for the MNO to which each customer belongs to. As mentioned by the participant customers and an agent, the very small service charge for the great convenience received enabled customers to use the service frequently. Besides, the large customer base acquired through the virtuous cycle, paid off the low revenue in each transaction by yielding economies of scale for the partners. A MNO representative claimed:

> *"If we look at the fee we receive for a transaction, it is nothing. But when we look at the total revenue, it is huge".*

Similarly, as the IT capability was developed for introducing new services and offering it into a new sector, FinSE required only a new application programming interface, promotional activities and negotiation. This IT capability reduced the cost and time for scaling up into diverse sectors and offering new services, thus, yielding economies of scope for FinSE. As such, like EduCorp, a virtuous cycle evolved as the indirect path that led intangible IT value to economic value for the firms engaged in FinCorp. The next section discusses the enabling and inhibiting conditions that were found to shape the dynamic of co-creation in the two cases.

4.5 Enabling and inhibiting conditions

Our empirical data shows that alignment of IT resources with complementary

resources and partners' mutuality of interests played a key role in the co-creation process of social-commercial alliances (e.g., Austin & Seitanidi, 2012b; Sarker et al., 2012). We found that the relevance between core business operation of commercial firms and the intended project by social enterprises, and commercial firms' earlier engagement in CSR activities influenced them to link their interest with social enterprises' motives, hence the potential of value co-creation increased. One of the MNO representatives stated:

> *"This is not something very different than the way we do our business. It made things easier for us. (EduCorp) is one of the VAS in our portfolio that we are providing very easily partnering with them (EduSE)".*

Another participant from an MNO mentioned, "*We always try to be associated with such projects that help development of our society*". Our analysis also reveals that sharing IT resources that are complementary and compatible with partners' resources also influence the partners' collaborative engagement, hence the co-creation process. For example, in EduCorp, co-creation between EduSE and SoftTech was found to be more integrated than that occurred between EduSE and MNOs. We found that, to combine their resources appropriately EduSE had to engage closely with SoftTech. But for accessing the network of MNO, SoftTech and EduSE did not have to interact with MNO regularly even though the network was key for the service. A representative of EduSE stated:

> *"What we have, they do not have. But, what they have, we do not have. So, frequent interaction (with SoftTech) was a must for the service to develop. […]. We did not have network (too), but we rarely had a new issue to discuss with them (MNOs) about network. Still, we communicated for other issues like promotion, may be once or twice a month".*

Again, though the resources shared between FinSE and MNOs in FinCorp were found to be complementary, like the engagement between MNOs and EduSE, the former's co-creating relationship was not so proactive. Rather value co-creation was facilitated in many instances by perceived societal pressure or regulatory pressure.

With respect to this, our analysis reveals contextual factors (i.e., regulatory pressure, perceived societal pressure, government's favorable commitment, and donor's

support) as important conditions for IT value co-creation in a social-commercial alliance. We found that to influence two of the MNOs to engage quickly with FinSE in the FinCorp case, the latter required pressure from regulatory bodies' (central bank). Without such regulatory pressure it would have been difficult or more time consuming for the alliance to co-create and yield higher value. Similarly, the information capability co-created for fraud protection was not spontaneous for leading MNO rather it was mainly stimulated when the MNO experienced social pressure of being negatively branded and potential regulatory pressure by FinSE. As is claimed by their representative:

> *"We always have some pressure on us. […] Had we not provided the support, they [FinSE]) would have negatively represented us to the regulatory body and to the market that we did not want the e-wallet to be fraud protected. However, in the end, it adds value to our customers too".*

Our empirical data shows that, the government's favorable commitment to develop 'digital Bangladesh' by 2021, something which facilitated both FinSE and EduSE to get the support of the regulatory bodies when negotiating with other partners especially with the MNOs. For example, a senior manager of FinSE stated:

> *"The government wanted it [Mobile Financial Services] to launch, it was in line with their vision [digital Bangladesh]. So they made a favorable regulation. […] They were very supportive to bring all the MNOs into the platform".*

Similarly, the government's support to bring all MNOs under the single umbrella and to use the same short code 3000, were highlighted by EduSE participants. We also found FinSE to be concerned with the continuity of the current regulation that MNOs could not provide digital money transfer services on their own. In order to maintain stability in the industry FinSE engaged in co-creation with MNOs. On the other hand, EduCorp was funded by an international development organization and it has been attributed as one of the factors for EduSE's flexible approach with its commercial partners. Moreover, once the funding period was over, the co-creation of service was under potential risk of being stopped, potentially converting such a successful service to an unsustainable project. It indicates that for a nonprofit social-commercial alliance, a donor's intermittent and continued commitment has an effect on co-

creation of value for the engaged firms. Otherwise, they would have needed a 'shared value' model like FinCorp to avoid such a risk. As such, our analysis shows that there are some associated contextual factors (i.e., regulatory pressure, perceived societal pressure, government's favorable commitment, donor's support) that impact the co-creation process in a social-commercial alliance.

In addition, we found governance mechanisms as an important condition for value co-creation (cf. Poppo & Zenger, 2002; Sarker et al., 2012) even in a social-commercial alliance. Our empirical analysis earlier highlighted how the high engagement and frequent interaction between EduSE and SoftTech created each other's good will and commitment into the platform development process. While there was contractual agreement between the partners, the mutual trust built upon goodwill, which worked as a self-reinforcing mechanism to continue the co-creating activities. It enabled them to co-create value in a synergistic integration mode, while co-creating higher IT value through a virtuous cycle. In FinCorp, FinSE and MNOs were loosely coupled and a lack of self commitment and trust among them was observed. In turn, value was mainly co-created through exchange or addition and in a few cases influenced by contextual pressures. However, our analysis reveals that, financial incentives in a for-profit social-commercial alliance have a major influence on the collaborative mechanism between the social enterprise and commercial firms. This acts as a governance mechanism between collaborating parties. In FinCorp, we observed MNOs negotiating with FinSE and the regulatory authority to increase their share of the revenue. This resulted in loose coupling of the partners and a lack of trust between them. On the other hand, it was noticed that the same MNOs while engaged with EduSE in EduCorp offered a discounted rate initially for their IT resources, provided further discounts after negotiation over time, and eventually offered digital campaign facilities free of cost. This indicates that, when social value is the only motivation for the SE, the partnering firms are found to be more flexible and accommodative to one another, and committed to achieve higher social value. This may lead even to sacrificing personal motivation (sacrifice financial gain for altruistic value). A MNO participant claimed:

> *"They were quite flexible and was happy with that [campaigning digitally any time of the month]. [...]. Sometimes I found them less enthusiastic, may be because it's a donor funded developmental project".*

Another associated condition that may have influenced the alliance governance is value renewal for the firms involved during the co-creation process. As co-creation generates higher and new value, the value proposition of the partners may change over time. Failure to adjust the new value proposition of involved partners can cause termination of the value co-creation process (cf. Austin et al., 2000). We found the co-creation process of FinCorp (with the leading MNO) was under potential risk as it required value renewal for the partners engaged in the co-creating relationship. The discontent of the leading MNO is reflected as an interviewee stated:

> *"They only share for revenue generating transactions, for example, cash out. But my core resources are used even when the customers check their account balance which is completely free.[…]. Initially it was fine as we got unutilized channels. But nowadays it consumes so many resources and we are not compensated".*

As such, value renewal over time is required to avoid unilateral exploitation of resources and to build a sustainable co-creating relationship instead.

5. DISCUSSION: A THEORETICAL MODEL OF IT VALUE COCREATION IN SOCIAL-COMMERCIAL ALLIANCE

The in-depth analysis of two case studies in Bangladesh enabled us to explore how engagement of social enterprises and commercial firms leads to co-creation of IT value and, to build new propositions and extend current conceptualizations as to their motives to co-create through IT. In this section, we discuss our findings of firms' motives to co-create in relation to extant literature and offer a model as to *how* new IT value is co-created for social-commercial alliances.

Our data analysis, in both cases, show that though those disparate motivations trigger or influence firms to join in an alliance, sharing their resources did not automatically lead to greater value for those firms, rather greater value emanated from a collaborative mechanism of co-creation through IT. We found that IT (e.g., technology and expertise) as key resources stimulated firms to engage into frequent interactions, developed strong collaborative relationships and enabled co-creation into both social-commercial alliances. Our analysis revealed that, engaging into three

modes of co-creation namely addition, exchange and synergistic integration (Sarker et al., 2012) firms in both alliances co-created both direct and indirect IT value. However, in case of nonprofit alliance (EduCorp), firms were found relatively more flexible, supportive and interactive leading them to engage in more synergistic integration than that we observed in the for-profit social-commercial alliance (FinCorp). We found, firms in FinCorp engaged in co-creation mostly through addition and exchange and their engagement in synergistic integration was largely influenced by several contextual factors (e.g., perceived pressure of negative image to the customers, pressure from regulatory authority).

Our study shows that while the primary motivation for social enterprises is to develop a digital service for customers, through co-creation those enterprises gained greater value than either could have anticipated or created. Social enterprises achieved this by developing better IT capabilities (e.g., information capabilities). We found that by capitalizing upon these IT capabilities, both EduSE and FinSE were able to gain greater social value from improved processes, while addressing core social problems. These empirical findings indicate social enterprises' motivations to develop better IT capabilities through co-creation. Based on this, we develop the following proposition:

> *Proposition 1(a): Social enterprises co-create with commercial firms to develop diverse IT capabilities, which they cannot afford to develop on their own.*

While extant social-commercial alliance literature discusses that access to funds or other resources is social enterprises' primary motivation to engage with commercial firms (e.g., Brown et al., 2010; Austin & Seitanidi, 2012a; 2012b), our study complements previous literature by showing that social enterprises are also motivated by the potential to develop IT capabilities for which they seek access to technological resources from commercial firms. Our conceptualization is well supported by the existing literature (e.g., Andrade & Urquhart, 2009; Brown & Grant, 2010) that highlights the potential of IT to alleviate poverty and achieve socio-economic development, if IT is deployed appropriately.

Our study indicates that commercial firms look for business expansion opportunities through which they can exploit their unutilized IT resources. Our study corroborates

existing knowledge that commercial firms often join social enterprises to get a license to operate in a market (Moser, 2001; Loza, 2004) or to create new products and services (Kourula, 2010). At the same time, our study also offers evidence that, by co-creating, commercial firms try to better utilize their IT resources (e.g., customer usage data capture, store and analysis, air-time top up, etc) for business expansion opportunities. Hence, we assert:

> *Proposition 1(b): Commercial firms co-create with social enterprises to pursue additional business opportunities by exploiting unutilized IT resources.*

Our analysis in both cases reveals that commercial firms share IT resources into a social-commercial alliance while being motivated by financial benefits. This finding offers new insights for the social-commercial alliance literature by showing that commercial firms' natural motivation of acquiring financial value persevere, irrespective of whether they partner with a for-profit or a nonprofit social enterprise. Our findings in this regard add to the extant literature (e.g., Yaziji & Doh, 2009; Choi, 2015), which mostly shows that social enterprises have a motivation to access funds for which they join with commercial firms. We found, more utilization of their IT resources through co-creation incentivized the commercial firms with additional financial value (a direct IT value) in both alliances (e.g, activity based payment in EduCorp and bulk SMS sale in FinCorp). Our analysis also showed that the intensity of commercial firms' financial motives is likely to depend on the social enterprises' motivation (for-profit or nonprofit) in the alliance. We also found that social enterprises in for-profit social-commercial alliances are motivated towards financial gains from the IT-enabled solution developed, while non-profit social-commercial alliances are not. It enables us to suggest the following propositions on the motivation for commercial firms and social enterprises to co-create with one another:

> *Proposition 2(a): Commercial firms with IT resources co-create with social enterprises (both for profit and nonprofit) to invest those IT resources for additional financial value (e.g., resource fees, monthly rent etc.).*

> *Proposition 2(b): For-profit social enterprises co-create with commercial firms to expand financial value from the development of IT-enabled solutions.*

Our study offers valuable insights for the social-commercial alliance literature (e.g.,

Kourula, 2010; Seitanidi, 2010; Austin & Seitanidi, 2012b) by showing that, as in a B2B alliance, market forces like competition can play an important role for commercial firms to get engaged with social enterprises. This phenomenon is especially vivid when many firms have similar IT resources that are required by social enterprises to address a core social problem. In such a case, customers of one commercial firm cannot enjoy the maximum benefit of the offering unless that commercial firm becomes a partner with the social enterprise. As a result, commercial firms, even by joining within a nonprofit social-commercial alliance, try to achieve competitive advantage over its competitors. Again, partners with closer relationships gained better positioning in the market as they promoted each other through their business. On the other hand, social enterprises were found to be motivated to engage all MNOs so that they could achieve greater social value by serving as many customers as possible and by providing better services through co-creation. Based on the above, we assert:

> *Proposition 3(a): In the presence of more than one commercial firm with similar IT resources, commercial firms co-create with a social enterprise to achieve competitive position in the market.*

> *Proposition 3(b): Social enterprises co-create with commercial firms to provide diverse services to a wider group of customers by leveraging commercial firms' customer base.*

While extant literature discusses firms' motivations to form an alliance, the above propositions offer a new perspective on social enterprises and commercial firms' motives to engage in an alliance and co-create IT value. In summary, by engaging into co-creation, commercial firms can gain additional financial value, expanded business opportunities and a competitive market position. Social enterprises can appropriate greater social value through improved digitized services to a large pool of customers while also gaining additional financial value (in case of for-profit SE) than initially anticipated. Our study shows that new intangible IT value (i.e., agility, learning, reduced cycle time, increased legitimacy, faster to market) is co-created for both firms in the alliance that works as accelerator to achieve anticipated value (as shown in Table 4 and Table 5).

Our analysis also revealed that due to their continued co-creating relationships, the participant firms in both cases could realize the value co-created in one cycle for the succeeding cycles. As such, their repetitive engagement, in value co-creating activities utilizing the value emanated earlier, emerged as a virtuous cycle of value co-creation and offered economies of scale for commercial firms and for-profit SE, while also offering economies of scope for the social enterprises. Based on the above, we put forward the following propositions:

> *Proposition 4(a): Commercial firms continue to co-create with social enterprises to achieve economies of scale through a virtuous cycle of value co-creation.*

> *Proposition 4(b): Social enterprises continue to co-create with commercial firms to achieve economies of scope and greater social value through a virtuous cycle of value co-creation.*

However, such engagement was found to be conditioned to several factors that enable or inhibit the co-creation. Building on these empirical findings of novel motivations, different modes of co-creation, IT value co-created in different cycles and the enabling/inhibiting conditions that affect such co-creation, we offer a conceptual model for IT value co-creation in social-commercial alliances in Figure 1.

Figure 1: A Model of Co-creation of IT Value in Social-Commercial Alliance
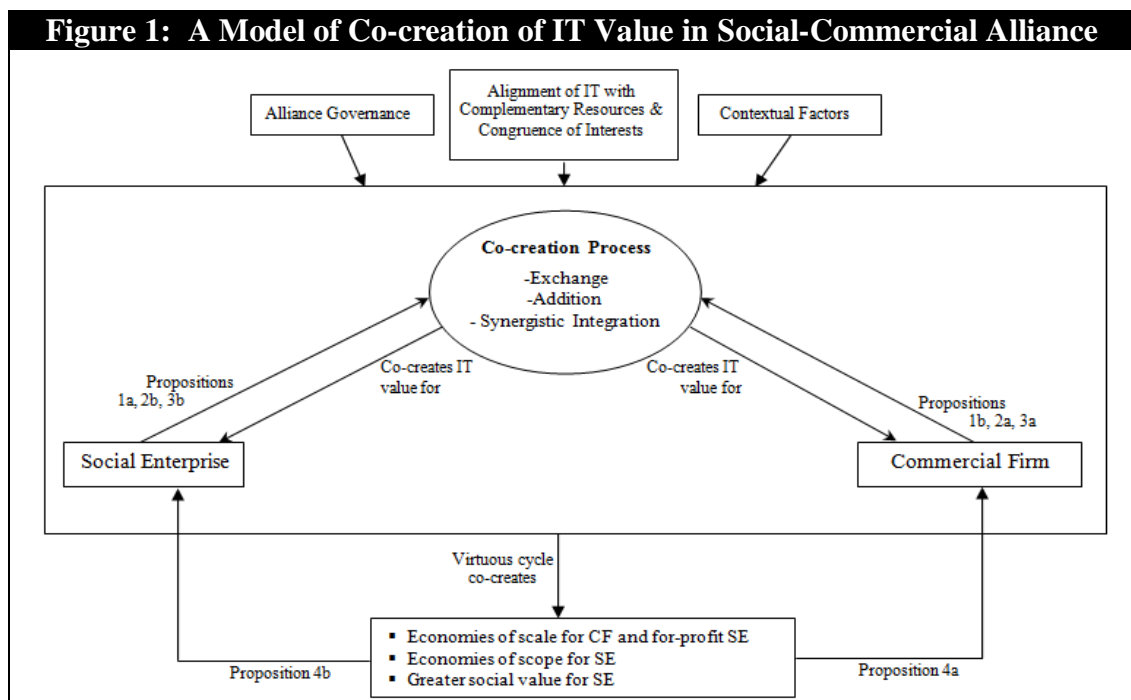
Our theorizing offers new insights for both the emerging literature on IT value co-creation and social-commercial alliance by responding to calls to better understand IT value co-creation (Kohli & Grover, 2008) in social-commercial alliances (Austin & Seitanidi, 2012a).

Our proposed model illustrates how a virtuous cycle evolves while firms continue to engage in IT value co-creation by building on earlier cycles. In contrast to the common trend of focusing on economic components of value, we consider both direct (economic components) and intangible value in-depth and show how the intangible value co-created could lead to direct value. Thus, our research responds to an earlier call into value co-creation (Grover & Kohli, 2012, p. 231) to explicitly show how a virtuous cycle can be conceptualized as an indirect path to economic value for the intangible IT value co-created in an alliance. Through this, we offer new insights to the literature by showing that even successful firms are motivated to co-create economic value directly or through an indirect path, which they could not have acquired otherwise.

Our findings show that co-creation in social-commercial alliances may take place in all three modes – exchange, addition and synergistic integration (Sarker et al., 2012). At the same time, our findings show that co-creation through synergistic integration is more likely to occur in an alliance where non-profit social enterprises are engaged with commercial firms rather than for-profit SE. We show that co-creation in social-commercial alliance is a dynamic process wherein one commercial firm may engage in synergistic integration with the SE, while at the same time, other firms may co-create through addition or exchange, and this dynamic process may change over time due to certain enabling and inhibiting conditions.

In terms of conditions, our findings point out that alignment of IT with complementary resources, congruence of partners' interests, and alliance governance are critical for co-creation of IT value. We complement these findings by showing that contextual factors can play a role in IT value co-creation in a social-commercial alliance. We found that the government may influence the value co-creation process by providing enabling contextual factors such as favorable political commitment, continuity of regulation, regulatory pressure. Conversely, failure to do so can be a

threat for co-creation and undermine government support to CE. These findings shade light on 'outside-in' view of co-creation, that is, how market forces can stimulate or inhibit co-creation while extant B2B literature mostly provides insights on 'inside-out' view of co-creation (Grover & Kohli, 2012). Moreover, with respect to alliance governance, we showed that profit motives and value adjustment can influence how the dynamics of governance unfold in the social-commercial alliance. Our findings add to the literature on IT value co-creation (Grover & Kohli, 2012; Sarker et al., 2012) in that, for a sustainable co-creating relationship, value for the partnering firms need to be reassessed and adjusted periodically.

Furthermore, our study contributes not only to the literature on IT value co-creation but also to the research on social-commercial alliance while responds to call for further empirical studies of co-creation in such alliance (Austin & Seitanidi, 2012a). First, while we acknowledge the social enterprises' and commercial firms' motivation to engage in a social-commercial alliance as pointed out in extant literature (e.g., Kourula, 2010; Seitanidi, 2010; Austin & Seitanidi, 2012b), our theoretical propositions extend our understanding of motivation to co-create by especially focusing on IT as a key resource. By focusing on co-creation through IT and by exploring how (addition, exchange and synergistic integration) and what IT value (direct and intangible) is co-created in social-commercial alliances, our study fills an important void in the extant social alliances literature, which does not focus on IT.

Our study also shows that in both cases every usage of the service adds social value to the firms, while at the same time, it also incentivizes concerned firms with financial value. Hence, we offer insights for the social-commercial alliance literature (Austin & Seitanidi, 2012b) that social value and economic value are created simultaneously for the firms involved in social-commercial alliances rather than sequentially.

Our findings have important implications for practice. Firstly, examining how co-creation yields more value for partnering firms, the managers of commercial firms can realize the significance of engaging into co-creation. It also encourages firms to engage in co-creation through IT highlighting the significance of IT as co-creating resource. By explicating co-creation modes and conditions that facilitate greater value achievement through co-creation especially in social-commercial alliances, our study

offers guidelines to practitioners for co-creation in such alliance. Such valuable insights would ensure that they are headed toward joint gains instead of unilateral exploitation, while alliances exhibit low success rate (Kale & Singh, 2009). While managers are mostly motivated by financial value, our insights on how intangible value may lead to direct economic value through a virtuous cycle of value enhancement, could motivate managers to focus or seek more intangible IT value in a social-commercial alliance.

6. Conclusion

By investigating IT value co-creation in social-commercial alliances in an emerging market, we addressed theoretical and empirical gaps in the IS and social-commercial alliance literature. First, our study offers a novel perspective on commercial firms' and social enterprises' motivation to co-create that adds to the extant social-commercial alliance literature. Specifically, we found that while IT resources are shared in the alliance by commercial firms, social enterprises are motivated too to be a part of the social-commercial alliance. We find that commercial firms join social enterprises to create an opportunity to exploit more of their unutilized IT resources, to maintain a competitive position in the market, and to seek financial incentives for their IT resources. On the other hand, social enterprises are motivated to collaborate with commercial firms to develop IT capabilities, to access partners' customers' base and to seek financial incentives (in case of for-profit) with an aim to achieve greater social value. We empirically show that co-creation enables participating firms to gain higher direct (i.e., more financial benefits) and intangible value (e.g., better IT capabilities, better and wider service, better competitive position, more opportunities) than they anticipated while forming the alliance. At the same time, the alliance yield new IT value in the form of agility, flexibility, faster to market and learning.

We have proposed a theoretical model that explains IT value co-creation social-commercial alliances. While our proposed model shows three modes of IT value co-creation namely addition, exchange and synergistic integration, we suggest that non-profit social-commercial alliances are more likely to engage in synergistic integration than for-profit ones. Our model introduces a virtuous cycle in the co-creation process that evolves as firms continue to engage in IT value co-creation by building on earlier

cycles. In addition, we offer new insights to the IS (more specifically to IT value co-creation) literature by conceptualizing this virtuous cycle as an indirect path to economic value for the intangible IT value co-created in an alliance. Through this virtuous cycle of co-creation, commercial firms may achieve economies scale while social enterprises gain economies of scope.

Finally, we articulate contextual factors like government's favorable support, political stability and continuation of donor's fund that facilitate or inhibit co-creation of IT value. We emphasize the reassessment and readjustment of co-created value so that the virtuous cycle of IT value can continue. We encourage practitioners in social-commercial alliances to engage in co-creation to create greater value for both partners to address social and business problems.

NOTES

1. Currency exchange rate 1 BDT= .0096 GBP; Source: http:// www.xe.com (accessed 25th May, 2017).

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Conclusion

The broad research objective of this study was to develop an empirically based better understanding of the dynamics of digital entrepreneurship and innovation in emerging markets. With this objective in mind, this thesis explored different aspects of digital entrepreneurship and innovation in an emerging market in three phases. The last three chapters (Chapter 4, 5 and 6) provided in-depth discussions in terms the specific objectives, relevant literature, methodologies, case summaries, contributions and implications for each the three phases of the study. In this chapter, a summary of the contributions to the knowledge, implications for theory and practice, and future research from those three chapters have been highlighted relating to the broad objective of the study.

6.1 Contributions and implications for theory

In this section, based on the findings of three papers, the dynamics of digital innovation and entrepreneurship in emerging markets is highlighted and then the theoretical implications of the findings are outlined.

This thesis offers a process framework for digital entrepreneurship and innovation that illustrates how the dynamic interplay between entrepreneurial agency and context co-evolve through digital technology, especially when the entrepreneurs have experience in affluent market but do not have local knowledge of the emerging markets. The framework is developed by showing that entrepreneurs experience separation due to their gap in contextual knowledge and enter a transition phase or liminality. During the transition phase, entrepreneurs experience *ambiguity, an opportunity to experiment and explore novel idea,* and *a sense of community* as liminality that induce them to undertake different actions which are also enabled by data homogenization, reprogrammability, accessibility and ease-of-mastery capabilities of digital technologies. As such, the thesis illustrates that digital innovations in emerging markets offer liminal space for entrepreneurs. The proposed

process framework also shows that during this transition phase entrepreneurs begin to consciously adapt their traditional practices, to synchronize their initiatives to users' capabilities and to rising contingencies, and to foster a dynamic engagement of collective efforts. The three practices together are found to mutually constitute the context, entrepreneurial actions and digital technologies to incorporate contextualized digital solutions for an emerging market. The study suggests these three practices to contextualize digital innovation in emerging markets, and conceptualizes digital entrepreneurship and innovation as a constitutive process.

Following the findings of constitution of digital innovation as dynamic interplay of entrepreneurial actions, contexts and digital technologies, this thesis further investigated the impact of continuous exploitation and exploration of opportunities through digital technologies on the enterprises that undertook such digital initiatives. It offers a detailed account of how enterprises are successfully transformed without adopting a classical framework like Enterprise Architecture Management (EAM) that extant literature suggests. It is found that the entrepreneurial firm encountered multifarious challenges and addressed those successfully taking real time decisions to make a path. It proposes a novel conceptualization of technology driven transformation in developing countries as an emerging path creation process. It shows that digital technology driven enterprise transformation in emerging markets emerges by "mindful deviation" of the entrepreneurs which can take different paths rather than a pre-planned, structured sequential process or an outcome of random events.

In terms of value for firms' engagement into social-commercial alliance deploying IT, the thesis offers a theoretical model that explains IT value co-creation in social-commercial alliance. While the proposed model shows three modes of co-creation through which participant firms co-create IT value for them, it also adds to the previous model by exploring how a virtuous cycle evolves as firms continue to engage in IT value co-creation by building on earlier cycles. The study conceptualizes this virtuous cycle as an indirect path to economic value for intangible value co-created and explicitly shows that by co-creating both commercial firms and social enterprises gain higher direct (economic) and indirect value (e.g., better customer service, loyalty, agility, faster-to-market) than their preliminary anticipation. This study proposes the co-creation process as a dynamic process wherein one commercial

firm may engage in synergistic integration with the SE while at the same time other firms may co-create through addition or exchange. The non-profit alliance were found to engage more in synergistic co-creation while value co-created for firms in for-profit alliance mainly through addition and exchange. The thesis develops propositions related to firms' motivations to engage in co-creation by explicitly showing how co-creating through IT enable firms to yield more of the value they anticipated, while at the same time, it also co-creates new IT value for the firms engaged. The co-creation process is found to be influenced over time due to certain enabling and inhibiting conditions. Relating to conditions, this study complements existing literature by showing that contextual factors like favorable political commitment, continuity of regulation, regulatory pressure, perceived users' pressure can play a role in IT value co-creation in a social-commercial alliance.

The findings of this thesis have several implications for theory. First of all, this study, by conceptualizing digital entrepreneurship as a constitutive process (Garud et al., 2014), advances the emerging literature of digital entrepreneurship that suggests digital entrepreneurship practices are inherently socio-material (e.g., Davidson & Vaast, 2010). The study explicitly illustrates how the capabilities of digital technologies inform and transform entrepreneurial agency, while helping the latter shape innovation contexts. In doing so, this study addresses an empirical void into the emerging literature of digital entrepreneurship (see Nambisan, 2016) and also responds to a recent call by Fang et al. (2017) for research on digital entrepreneurship and innovation. This research is arguably the first to apply the constitutive perspective in a study of digital entrepreneurship and innovation in an emerging market context and to develop a process framework for the same that contextualize innovation in these markets.

The proposed framework is an important contribution to the stream of IS literature focusing on emerging markets (e.g., Avgerou, 2010; Xiao et al., 2013). By developing a process framework that shows how a socially embedded digital innovation evolves through a constitutive process of digital entrepreneurship, it responds to the recent calls by several IS researchers (e.g., Avgerou, 2010; Xiao et al., 2013) for theory development based on emerging market contexts. This thesis by demonstrating how entrepreneurs in emerging markets go through liminality during digital innovation

projects contributes to the IS literature in the context where the concept of liminality is underutilized. It offers new insights to the literature by showing that liminality offers opportunities to the entrepreneurs to minimize their gap in local knowledge and become creative during the project to offer successful digital innovation in these markets. In this regard, the study signifies the importance of symbolic separation from existing practices that will help entrepreneurs go through a faster unlearning/learning cycle and begin to address the unique challenges of emerging markets with equally unique innovations. The thesis also responds to recent calls for more empirical research on the digital innovations based on mobile phones, as well the use of multiplatform-based digital innovations in emerging markets (Chaudhuri, 2012; Xiao et al., 2013).

In addition, this thesis offers an important contribution to the Enterprise Transformation (ET) literature. While the extant literature on ET highlights a predesigned and structured style of management for ET and focuses on contemporary EAM or fine-tuned context specific EAM for successful transformation (e.g., Asfaw et al., 2009; Lahrmann et al., 2010; Labusch & Winter, 2013), this thesis adds to this literature that ICT driven transformation in emerging markets is an emerging path creation process. Though the literature suggests a holistic management approach (Labusch & Winter, 2013; Labusch et al., 2013), the thesis argues that, ET, in the given context, is not a pre-planned, coordinated approach; rather transformation emerges by "mindful deviation" of the entrepreneurs which can take different paths. It argues that contemporary EAM may not be a suitable approach for state-owned enterprises in the developing country, rather reflexive actions and on demand coordination are more applicable to such enterprises. Success, thus, depends on how skillful entrepreneurs take advantage of the ambiguous and strategic spaces (Ravishankar, 2013) offered by multifarious challenges in emerging markets.

By offering insights, the thesis also contributes to the IT value co-creation and social alliance literature. First of all, the proposed model extends previous research (e.g., Sarker et al., 2012) by exploring how a virtuous cycle evolves while firms continue to engage in IT value co-creation by building on earlier cycles. Thus, this research responds to an earlier call into value co-creation (Grover & Kohli, 2012: 231) to explicitly show how a virtuous cycle can be conceptualized as an indirect path to

economic value for the intangible IT value co-created in an alliance. While the research findings corroborate Sarker et al. (2012) in showing that co-creation in diverse multi-firm alliances may take place in all three modes – exchange, addition and synergistic integration, at the same time, this research complements Sarker et al. (2012) by adding that co-creation through synergistic integration is more likely to occur in an alliance where non-profit social enterprises are engaged with commercial firms rather than for-profit SE. Furthermore, the thesis complements existing literature by showing that contextual factors can play a role in IT value co-creation in social-commercial alliance. It shows that the government and the perceived negative image to the users may influence the value co-creation process by providing enabling contextual factors. Conversely, failure to do so can be a threat for co-creation and undermine government support to CE.

Finally, this thesis also contributes to the literature on social alliance by advancing understanding on firms' motives to co-create through IT in social-commercial alliances. By focusing on co-creation through IT and by exploring how (addition, exchange and synergistic integration) and what IT value (direct and intangible) is co-created in social alliances, this thesis fills an important empirical and conceptual void in the extant social alliances literature (e.g., Austin & Seitanidi, 2012a; 2012b) which does not focus on IT and also calls for further empirical research.

6.2 Implications for practice

The findings of this thesis also have implications for practice. First of all, I believe that the findings of the two case studies in the first article can be seen as an important contribution to practice for those involved in digital innovation projects. The three practices identified, in this study namely, *consciously adapting traditional practices*, *synchronizing initiatives to users' capabilities and to rising contingencies*, and *fostering a dynamic engagement of collective efforts* could help entrepreneurs overcome the liminality faced in emerging markets and achieve successful innovation. These practices could serve as a consultable reference for the developed countries and the development organizations that focuses on the rapid socioeconomic development of emerging markets through digital technologies (UNESCO, 2002; UN Millennium Project, 2005).

The findings suggest that entrepreneurs must accept the gap in contextual knowledge when entering an emerging market and go through a learning process by which to cultivate new knowledge and to create value from that, instead of being preoccupied with challenges in resource constraints, institutional voids and a user base with a very low income and low literacy as obstacles for successful innovation. Through these practices, they can address any unanticipated 'twist and turns' (Ali & Bailur, 2007) appearing during the innovation process. An implication for policy makers, in this regard, is that they should provide a supportive political and institutional framework, which would accommodate a dynamic approach of innovations as is seen in both cases. This would foster a culture of innovation in the firms reaching out to the poor communities.

The findings of the thesis also offer practical implications for those who take advantage of digital technologies to transform an enterprise. Since, multifarious challenges are inherent in emerging markets, the practitioners (e.g., entrepreneurs) need to consistently cultivate them to transform an enterprise through digital technologies. They must recognize that a preplanned structured management approach is not adequate for digital technology-driven transformation in the emerging markets, rather entrepreneurs need to 'mindfully deviate' to overcome the challenges as and whenever require. As such, enterprises need to foster a process that offers flexibility, contingent responses and continuity for digital technology driven transmission in this market.

In addition, an implication for the firms involved into digital innovation projects is realizing the significance of engaging into co-creation. By explicating co-creation modes and conditions that facilitate greater value achievement through co-creation especially in social-commercial alliances, this thesis offers guidelines to practitioners for co-creation in a social alliance. Such valuable insights would ensure that they are headed toward joint gains instead of unilateral exploitation, while co-creation initiatives exhibit low success rate (Sarkar et al., 2009). Finally, since managers are mostly motivated toward economic value, the insights of this study on how intangible value may lead to economic value through a virtuous cycle of value enhancement, could motivate managers to focus or seek more intangible IT value in a social alliance.

Overall, this thesis findings show that successful digital innovation projects can play key role in socio-economic development of the poor communities in emerging markets, while at the same time, it adds value to the firms engaged in these projects. While there is a high ratio of failure of such projects reported in the literature (Heeks, 2002; Venkatesh & Sykes, 2013), the success of the three case studies (EduCorp in education, AgriCorp in agriculture and FinCorp in finance) covered in three phases of this thesis should give policy makers, governments, and multinational corporations the necessary impetus to continue the pursuit of such initiatives. The local and global MNCs would be encouraged to engage in digital innovation projects in emerging markets since they can yield more value than their anticipation engaging into co-creation. Again, the three practices identified could help them to overcome the inherent challenges contextualizing innovations for the emerging markets. While the local commercial firms can utilize their learning for expanding their business in global arena, similarly, the MNCs can adopt these practices for the poor in advanced markets and also for other markets to offer more for less.

6.3 Implications for future research

While the thesis have important contributions to different streams of IS and other relevant literatures, the findings should be considered recognizing its limitations, which also brings forth several avenues for future research. Since this research focused on users with low literacy, low income and low to no technology understanding who lived in an environment lacking supportive infrastructure, further research could examine whether the proposed process framework for digital innovation and entrepreneurship, in particular, the symbolic separation from existing knowledge is also important in settings where users are literate and have a basic understanding of technology. Again, insights on digital innovation and entrepreneurship process were offered from two separate case studies with two types of entrepreneurs (i.e., indigenous and non-indigenous) who did not have experience for working in projects in the similar contexts. Future studies can examine whether the practices proposed in this thesis are applicable for experienced entrepreneurs across different digital innovation projects.

Since the type of organization (e.g., private or public) as well as the sectors (e.g.,

finance, education or agriculture) the organization are from may have impact on how enterprises transform, this study did not explore those impacts due to its scope into a state owned organization. Future research on enterprise transformation should consider organizations from diverse sectors to investigate how digital innovation unfolds in those enterprises and its impact on the transformation of enterprises.

Further investigation is needed to examine whether the co-creation model developed for social-commercial alliance could be generalized in other settings. Particularly, this study draws from two cases which uses mobile platform as core IT resources, studies need to examine if the theoretical model are applicable for other IT resources too. Again, testing the propositions that have been developed as for motives of the commercial firms and social enterprises is another agenda for future investigation for the researchers of social alliances. This study draws on co-creation in social alliances wherein social enterprises are a non-profitable donor organization and a for-profit social enterprise. Future studies should consider involvement of government and civil society into social alliances to investigate their engagement in co-creation through IT.

Future research should consider longitudinal studies taking the data collection duration of this thesis into account. Two years is perhaps not long enough to fully understand the phenomenon of digital entrepreneurship and innovation, especially in a setting where the use of digital technology has no precedent and is in emerging phase. Since the findings of thesis are based on only one case (for ET) or two case studies, future research could be undertaken drawing from multiple case studies to generalize those findings. Future research is also necessary to examine the generalizability of the findings (e.g., process framework for digital innovation and entrepreneurship, conceptualization of ET as a path creation process, theoretical model for co-creation of IT value) in other countries with similar cultural characteristics and contextual constraints since the empirical data are drawn from cases in Bangladesh. Similarly, selection of the cases from an emerging market limits the generalizability of the findings to other contexts. Further studies could investigate in the contexts of developed economies to explore whether the findings in emerging economies are applicable in the developed markets.

Furthering these lines of research would refine the findings of this thesis while would

offer new insights for dynamics of digital entrepreneurship and innovation in emerging markets.

6.4 Concluding remark

In summary, this thesis sought to expand the understanding of dynamics of digital entrepreneurship and innovation in emerging markets. Undertaking the whole study into three phases, this thesis offers rich insights into the literature addressing both theoretical and empirical voids in this field. The first study develops a process framework for digital entrepreneurship and innovation in emerging markets and shows how entrepreneurs constitute social embedded digital innovations going through liminality. The second study shows that through continuous digital innovations enterprises may eventually transform and contributes to the enterprise transformation literature by conceptualizing ICT driven transformation in emerging markets as an emerging path creation process. It emphasizes 'mindful deviation' of entrepreneurs for ET in emerging markets, instead of adopting preplanned, structured enterprise architecture management approach. Finally, the third study explores value for firms engaging in such digital ventures wherein the firms are diverse in types. The study develops a model for co-creation of IT value in social-commercial alliances and offers several propositions as for motives of the firms to engage in such alliances. Finally, the implications for theory and practice, as well as future research are discussed.

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Appendix 3.A
Table 1: Coding and Analysis of Empirical Data from AgriCorp

Example of clusters of extracts that represent common concepts	Descriptive Coding : Coding of clusters	Theoretical Coding : Identifying liminality
"I worked for 10 years in the IT industry, but it was quite a different experience. It is not because of its technical difficulties rather how the project progressed. […] Can you imagine- we struggled to start the project for almost two years? And that is because- these people [AgriCorp management] did not know how to use computer and then few corrupted internal employees, their trade union, along with the farmers protested against the initiative. It took a long time to convince them [the users] and start the project. […] It does not conform to any theoretical model, neither what we learnt from academic books will work here. At least for us- it didn't." "I don't know any such project undertaken before (AgriCorp), I think it is the first of its kind project in Bangladesh. […] They were IT specialists and appointed by the Government. […] They might have developed many computer systems (IS), but what they did in Dhaka (the capital of Bangladesh) is not same for these poor."	-Overcoming influences of prior experience of developing information systems for affluent market and prior theoretical knowledge	**Separation:** Entrepreneurs finding themselves outside of their familiar context, setting aside prior experience and knowledge
"They wanted us to send SMS to the farmers instead of issuing Purjee. But the question was whether the illiterate farmers could read SMS." "Most of the farmers or their family members had a mobile phone. We were in a dilemma in devising a mechanism to reach those who did not have a mobile.." "We thought of that (accepting e-Purjee instead of hard copies of e-Purjee for payment) but could not implement as it would make the system more complex. Neither we have the resources to develop the massive infrastructure, nor can they (farmers) buy a computer, printer or internet connection. So we had to look for any other way to facilitate the printing of e-Purjee."	-Ambiguity in selecting means to goals due to contextual challenges	
"These people did not even know how to read Bengali, let alone English. […]. We thought of sending SMS in Bengali, but as the basic handsets did not support Bengali apps and fonts, we had to write the message in English. Otherwise the farmers had to buy new sets which could be nothing but ruining such an innovation." "It was a tough job, but we did it. We went to their (farmers') houses; talked to them, their families and neighbours. You know, in villages, they have big joint families. We found almost every alternate house has a kid who goes to school. We trained all of them, showed how the SMS would look like, which part of it was important and what to do once they received an SMS." "We engaged UISCs and integrated their computers with our system." "Even after several initiatives, they (corrupted employees) were exploiting loopholes. A2I started piloting an e-gazette but there were lot of problems."	- Trying out with different novel initiatives to overcome the contextual challenges	**Transition:** Entrepreneurs experiencing *ambiguity, opportunity to experiment, and explore novel idea*s, and *a sense of community*
"There were few innovative people in the senior management who deliberately wanted it to be successful. They tried to motivate the non-cooperative employees." "The most challenging task was to make the farmers accept and use the service. We relentlessly communicated with them and local communities. We employed trainers, distributed handbills with graphical presentation, used posters, bill-boards and banners. We advertised in the radio and state-owned television as well." "Even we did not know what is a server, what is a domain, how to run a computer. But we did not have to worry that much as they (entrepreneurs) co-operated us in every possible ways."	- Creating a community sense among those who worked towards a common goal of corruption free digital service	
"AgriCorp was one of the first projects. It was a successful one and had huge impact. It received many awards. […] We learned from this project that, how a digital service for the poor communities can be developed ensuring less time, lower costs and lower number of visits for them (farmers)." "… while few village primary school teachers were being trained, we found one teacher who touched the mouse for the first time in her life. We found her hands were shaking and she was failing to control it. You won't believe it, she was so afraid that she fainted after a while. […]. I think mobile is the best option till today since they use it regularly. At least no one will be fainted like her." "It was challenging but a new experience for us. We learned a lot from (AgriCorp). It made us confident. […] We are utilizing our experience in (AgriCorp) at the current projects."	-Learning of how to successfully offer digital services to poor people and utilizing learning	**Incorporation:** Entrepreneurs recognizing new experience and learning

Table 2: Coding and Analysis of Empirical Data from EduCorp

Example of clusters of extracts that represent common concepts	Descriptive Coding : Coding of clusters	Theoretical Coding : Identifying liminality
"… they (entrepreneurs) had some preconceived idea which they thought would be applicable for Bangladesh as well. […] As a medium, radio was their first choice. Maybe the radio is very popular in [country of donor organization]. Even the initial contents and accents were based on [country of donor organization]. However, they recognized the reality soon that scenario is completely different here". "They had to overcome the cultural differences between the users and the content designers, in developing the course materials. […] Even for audio accents they needed to change their position. They had a feeling like- why should we spend British money for American accents." "You can't work in the same way in Bangladesh as you worked in (a developed country). There are differences in culture, differences in expectations and skills of the users, engagements are various, capacity of the team is different, dealing with government and private organizations are also different. […]. You have to change the way of your working style, management approach and also your key considerations, because the context is quite a bit different."	-Abandoning preconceptions and overcoming influences of cultural background, prior experience and knowledge	**Separation:** Entrepreneurs setting aside existing practices as found outside of the familiar context that is radically different
"Even after the findings in a survey, it was hard for the senior management to believe that radio was not in the list and mobile was the most lucrative media for the people. They were not at all convinced, still they had to choose mobile as a platform." "The content was first developed by British professionals giving a dominance of (their) context. […] if the content is like: 'Do you want to ride a tube? Two friends are gossiping at the bank of the Thames.' How many people in Bangladesh will understand the term tube and Thames? They will think whether it is a river! A place! A food! Or something else! […] We changed the content, even the accent". "There was no benchmark for us and most of us had no experience in working such a project. That is one of the reasons for which we started with television and mobile, explored websites, newspapers (also CD/DVD, books) and ended up with local club." "We were not sure of how to manage it (time). Maintaining the activity schedule amid political unrest, specially for frequent 'Hartal' (strike), was a new challenge for us. It interrupted our regular official activities. We needed to repeatedly change schedule of production of television programmes, organizing fairs and other events, and it created a back log."	-Ambiguity in selecting means to goals and in approach to adjust with contingencies	**Transition:** Entrepreneurs experiencing *ambiguity, opportunity to experiment and explore novel idea, and a sense of community*
"First, our focus was on to design several programmes like magazine, drama series, game show for television. The idea was to create awareness and break the perception that English is hard to learn through some funny programmes." "As SMS was found to have low readability, we focused on IVR service. Moreover, we observed people can follow voice instructions easily if given appropriately in Bengali." "Basic handsets they (poor) use do not support Bengali fonts. The challenge was to incorporate Bengali as gif files into the WAP portal (mobile based web services). […]. (EduCorp) is the first complete Unicode supported Bengali website which facilitates to view Bengali without installation of any particular font in internet browser. We created a highly usable information architecture for the site that uses both Bengali for navigation and English for content. Even the error messages were displayed in Bengali." "A major portion of the internet users in rural areas was struggling with speeds of 14k or less. So, we made each page of the website to be less than 45k [...]."	Trying out with different novel initiatives to overcome the contextual challenges	
"We (a daily newspaper) are publishing the course contents free of cost for the last four years which reflects our commitment to social responsibilities." "We motivated them (different actors) to be a part of the national development project and they responded positively." "We cannot take share of the revenues as the donor policy does not allow it. But we are still working on whether we can handover it to the telecom operator or any other interested party after the project period is over."	- Creating a community sense among those who worked towards the common goal of developmental objective	
"We have never done any mobile based service. It taught us a lot- how to design and position a service in such a market, how to interact and coordinate different groups of partners, how the users can be engaged and many more. […]. Now we do a lot of work with mobile and (EduCorp) is the path finder." "We learned many things from (EduCorp). Few days back we went to GSM conference, everyone was interested to know about (EduCorp). They were asking questions one after another, why did you do it, how you did that … we were quite busy in answering those (questions).." "Different mobile-based projects are currently going on. Our learning in (EduCorp) has helped us a lot." "Using mobile for teaching was something completely new while television and radio are widely accepted media for it. Mobile was the most popular one, but we used multiple platforms. We inter-linked those platforms so that we can reach wide and meet users' different requirements. Even if you read 'Prothom-alo', you need to dial a number provided for the quiz or visit the website mentioned." "It is a very successful project, we achieved quite a more than our expectation. If you look at our recent survey results, we will feel the same."	-Finding appropriate technological solution, learning of innovation process, utilizing learning and sharing	**Incorporation:** Entrepreneurs recognizing new experience, learning and technological choice

Appendix 3.B

Table 1: Coding and Analysis of Empirical Data of the Transition Phase in AgriCorp

Extracts relating to transition	Descriptive Coding A: Identifying concepts relating to experience and actions undertaken during liminality	Descriptive Coding B: Key contextual challenges faced	Descriptive Coding C: Technological considerations
"They wanted us to send SMS to the farmers instead of issuing Purjee. But the question was whether the illiterate farmers could read SMS." "Most of the farmers or their family members had a mobile phone. We were in a dilemma in devising a mechanism to reach those who did not have a mobile." "We thought of that (accepting e-Purjee instead of hard copies of e-Purjee for payment) but could not implement as it would make the system more complex. Neither we have the resources to develop the massive infrastructure, nor can they (farmers) buy a computer, printer or internet connection. So we had to look for any other way to facilitate the printing of e-Purjee."	-Confusion in selecting appropriate technological means due to lack of infrastructure and farmers incapability - Engaging and getting support from senior management -Choosing mobile phones to send e-Purjee -Negotiating with government owned mobile operator	Resistance from employees and farmers Low literacy Low income Weak or lack of digital Infrastructure Corruption Lack of IT knowledge	Availability of Mobile phones Easy to train how to read mobile SMS Integrating systems
"These people did not even know how to read Bengali, let alone English. […]. We thought of sending SMS in Bengali, but as the basic handsets did not support Bengali apps and fonts, we had to write the message in English. Otherwise the farmers had to buy new sets which could be nothing but ruining such an innovation." "It was a tough job, but we did it. We went to their (farmers') houses; talked to them, their families and neighbours. You know, in villages, they have big joint families. We found almost every alternate house has a kid who goes to school. We trained all of them, showed how the SMS would look like, which part of it was important and what to do once they received an SMS." "We tried to engage UISCs and integrate them with our system." "Even after several initiatives, they (corrupted employees) were exploiting loopholes. A2I started piloting an e-gazette but there were lot of problems."	-Hesitation to send SMS to illiterate farmers -Trying with English SMS -Engaging school going kids to inform receipt of SMS and/or read SMS -Confusion to reach those farmers who did not have mobile -Engaging family members and neighbours -Engaging UISCs -Piloting e-gazette		
"There were few innovative people in the senior management who deliberately wanted it to be successful. They tried to motivate the non-cooperative employees. [...]. They arranged training for few officers and staffs to work on it. […]." "The most challenging task was to make the farmers accept and use the service. We relentlessly communicated with them and local communities. We employed trainers, distributed handbills with graphical presentation, used posters, bill-boards and banners. We advertised in the radio and state-owned television as well." "Even we did not know what is a server, what is a domain, how to run a computer. […]. We did not have to worry that much as they (entrepreneurs) co-operated us in every possible ways."	- Engaging different media (formal and informal) for promotional campaigns -Engaging farmers and local community in the process		

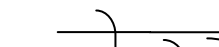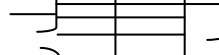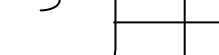**Table 2: Coding and Analysis of Empirical Data of the Transition Phase in EduCorp**
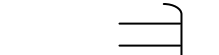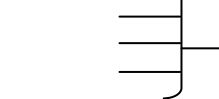
Extracts relating to transition	Descriptive Coding A: Identifying concepts relating to experience and actions undertaken during liminality	Descriptive Coding B: Key contextual challenges faced	Descriptive Coding C: Technological considerations
"Even after the findings in a survey, it was hard for the senior management to believe that radio was not in the list and mobile was the most lucrative media for the people. They were not at all convinced, still they had to choose mobile as a platform." "The content was first developed by British professionals giving a dominance of (their) context. […] if the content is like: 'Do you want to ride a tube? Two friends are gossiping at the bank of the Thames.' How many people in Bangladesh will understand the term tube and Thames? They will think whether it is a river! A place! A food! Or something else! […] We changed the content, even the accent". "There was no benchmark for us and most of us had no experience in working such a project. That is one of the reasons for which we started with television and mobile, explored websites, newspapers (also CD/DVD, books) and ended up with local club." "We were not sure of how to manage it (time). Maintaining the activity schedule amid political unrest, specially for frequent 'Hartal' (strike), was a new challenge for us. It interrupted our regular official activities. We needed to repeatedly change schedule of production of television programmes, organizing fairs and other events, and it created a back log."	-Lack of clarity in goals and selecting technological means to goals due to contextual differences -Confusion to choose mobile as technological platform -Initially focusing on television programmes - Engaging television channel -Confusion to choose contents and accents -Changing focus on SMS and mobile based IVR service -Engaging mobile operators under the same platform	Weak or lack of digital Infrastructure Political instability Negative perception on learning English Low literacy Low income	Mobile phones as the most lucrative platform CD/DVD for storing lesson materials Television (2nd in list in terms of reach) for breaking perception Low readability of SMS Easy to understand voice instruction of IVR Manipulating websites already developed and using it for the same platforms
"First, our focus was on to design several programmes like magazine, drama series, game show for television. The idea was to create awareness and break the perception that English is hard to learn through some funny programmes." "As SMS was found to have low readability, we focused on IVR service. Moreover, we observed people can follow voice instructions easily if given appropriately in Bengali." "Basic handsets they (poor) use do not support Bengali fonts. The challenge was to incorporate Bengali as gif files into the WAP portal (mobile based web services). […]. (EduCorp) is the first complete Unicode supported Bengali website which facilitates to view Bengali without installation of any particular font in internet browser. We created a highly usable information architecture for the site that uses both Bengali for navigation and English for content. Even the error messages were displayed in Bengali." "A major portion of the internet users in rural areas was struggling with speeds of 14k or less. So, we made each page of the website to be less than 45k [...]."	-Offering web-based service -Engaging technical vendor -Developing first complete Unicode supported Bengali website -Incorporating Bengali font as 'gif' file in the WAP portal to support basic handsets -Trying to overcome speed constraints reducing the size of the webpages		
"We (a daily newspaper) are publishing the course contents free of cost for last four years which reflects our commitment to the social responsibilities." "We motivated them (different actors) to be a part of the national development project and they responded positively." "We cannot take share of the revenues as the donor policy does not allow it. But we are still working on whether we can handover it to the telecom operator or any other interested party after the project period is over."	-Confusion of time management approach during political instability - Negotiation with newspaper and all partners to achieve sympathetic consideration in lowering fees so that the service is usable for the poor -Negotiation with partners to make the developmental project sustainable		

Appendix 3.C
Table1: Co-evolution of Digital Entrepreneurship and Innovation, and Identification of New Practices in the AgriCorp Case

Descriptive Coding A: Key contextual characteristics	Descriptive Coding B: Technological considerations	Theoretical Coding A: Grouping of entrepreneurial actions induced by *liminality* and enabled by *digital capabilities* capabilities	Theoretical Coding B: Identifying *enabling* of digital technologies
Low literacy Low income Weak or lack of digital Infrastructure Corruption Lack of IT knowledge	Availability of Mobile phones Easy to train how to read mobile SMS Integrating systems Using mobile SMS for different service	**New Practice:** Conscious adaptation of traditional practice E**xamples:** Choosing mobile phones to send e-Purjee Adopting mobile SMS system for diverse services delivery (rescheduling payment and cancellation of order) Using mobile for mobile-payment Adopting mobile for customer feedback Developing a web-based management system Developing an online dashboard to monitor real time e-Purjee distribution Piloting an e-gazette Trying with English SMS	Ease of mastery Accessibility Reprogrammability Data Homogeneity
		New Practice: Fostering a dynamic engagement of collective efforts **Examples:** Negotiating with government owned mobile operator Engaging UISCS Negotiating with software development firm Engaging different media (formal and informal) for promotional campaigns Engaging farmers and local community in the process Engaging and getting support of senior management	Reprogrammability and homogeneity enabled engagement
		New Practice: Synchronizing users' capabilities and contingencies to digital technology **Examples:** Engaging farmers' family members, neighbours and school going kids to inform receipt of SMS and/or read SMS Using UISCs to provide hard copies of e-Purjee from web Providing face to face training to farmers Abandoning the project for almost a year	Data homogeneity

Table 2: Co-evolution of Digital Entrepreneurship and Innovation, and Identification of New Practices in the EduCorp Case

Descriptive Coding A: Key contextual characteristics	Descriptive Coding B: Technological considerations	Theoretical Coding A: Grouping of entrepreneurial actions induced by *liminality* and enabled by *digital capabilities*	Theoretical Coding B: Identifying *enabling capabilities* of digital technologies
Weak or lack of digital Infrastructure	Mobile phones as the most lucrative platform	**New Practice:** Conscious adaptation of traditional practice	
		E**xamples:**	
		Initially focusing on television programmes	Accessibility
	CD/DVD for storing lesson materials	Changing focus on SMS and mobile based IVR service	
Political instability		Offering web-based service	Ease of Mastery
		Making media contents available in the web and WAP	
Negative perception on English learning	Television for breaking perception (2nd in list in terms of reach)	Introducing new lessons using both mobile and web	
		Offering customized learning options (track and progress)	Data Homogeneity
Low literacy		Introducing online and IVR based assessment system	
		Introducing assessment report for different lesson units	
Low income	Low readability of SMS	Publishing lesson materials in a newspaper (both printed and online)	Reprogrammability
Technology illiteracy	Easy to understand voice instruction of IVR	**New Practice:** Fostering a dynamic engagement of collective efforts	
		Examples:	
		Engaging BTRC and AMTOB	
Wide acceptance	Manipulating websites already developed and using it for the same platforms	Negotiating with the mobile operators to work under the same platform	Reprogrammability and homogeneity enabled engagement
		Engaging technical vendor for IVR platform and technical support	
New preferences		Negotiating with cyber cafes to use EduCorp homepage as desktop interface	
		Negotiating with print media (e.g., Newspaper, book publishers, CD/DVD production houses) and electronic media	
	Interlinking platforms	Engaging media to create awareness and build interest through promotion	
		Ensuring customers engagement through survey, field visit and phone contacts	
		New Practice: Synchronizing users' capabilities and contingencies to digital technology	
		Examples:	
		Trying to overcome speed constraints reducing the size of the webpages	
		Designing instructions and error message in Bengali for teaching English	
		Developing first complete Unicode supported Bengali website which does not require installation of any particular font in the device	Reprogrammability
		Incorporating Bengali font as 'gif' file in the WAP portal (mobile based web)	
		Publishing books and producing CD/DVD of lesson materials	
		Temporary adaptation with local culture (work at weekend) to manage schedule	