Master Thesis

The Paradox of Development

A case of Information Communication Technology for Development in Bangladesh

By Sandy Ye

Copenhagen Business School
Business and Development Studies
Fall - 2017

By Sandy Ye
Xita12ab@student.cbs.dk

Abstract
Today, the Information Communication Technology is being advocated by international organization to eradicate poverty, improve living conditions for the poorest, marginalized people, similar as CSR have been advocated 20 years ago. The digital age has often been described in the literatures as something new that will change the way we live, where the introduction of the Internet has changed the way we communicate with each other and affected the way we do business, and in many ways, it has. 20 years ago, before the era of Internet, international calls have been very expensive, we didn't have Facebook or Snapchat that enable us to stay in constant contact with our friends and family; and advertising and marketing channels didn't include social media, search-engine optimization and payment gateways. In the light of these recent technological advancement, some questions have emerged. One of them; "Is there nothing technology can't solve?" In this paper I have found that there is almost nothing that technology can't solve. The limitation lies not with the technology itself, but with us. As human beings, we have limited capability to understand, to investigate, where we are bound to our knowledge and experiences. By adopting Yin-Yang perspective, this paper enlightens some of the constrains that exists in the way we conduct research.

Acknowledgement

I would like to use this opportunity to thank Xin Li, whom was my first inspiration towards a holistic understanding of reality, namely the lectures about institutional theories, is a vital part for the understanding of the challenges that developing countries are facing, in order to catch up with the developed world. It is also here, that the predominant Western view is at its clearest. I would also like to thank Sudhanshu Rai, whom have very much open my eyes to the world; from the innovation trip he arranged in 2016 to India, and later the workshop this year about mindfulness and creativity. One important lesson was learned; as the meditation guru pointed out: what is one divide by zero equals? Not all questions in the world can be answered by the technologies of science.

Last but not least, my deepest appreciation goes to Sameer Azizi, my thesis supervisor, for your patience and guidance.

Table of Contents

Introduction **5**
Research Question 6
Structure of the paper 6
Philosophy of science **7**
The binary opposition in research. **7**
How science have formed the reality: 8
Research design 10
Literature review **13**
Information and Communication Technology for development (ICT4D) **13**
ICT and poverty alleviation 14
ICT and development 17
Introducing Paradox **20**
The origin of paradox? 21
Introducing Yin-Yang: 24
Analysis – paradox in ICT4D? **28**
The rural phone program in Bangladesh: **28**
Identifying paradox in Bangladesh's ICT: 29
Concluding discussion **32**
Reference **33**
Appendix 1 ..... **37**
In the context of developing countries 37
Social capital in emerging market context: 39

Introduction

From the beginning of time, we as human beings, have been fascinated by the idea of development. Today, "development" is a hot topic, discussed worldwide, in different contexts, by different people, public as well as private organizations. The latest example of this global debate is the UN's Sustainable Development Goals (SDGs). SDGs describe 17 initiatives that are recommending; higher degree of financial investment, strategic cooperation between nations, and the use of technology as a tool for development.

> *"... ending poverty must go hand-in-hand with strategies that build economic growth and addresses a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection[1]."*

Specially, technologies that is provided by the Information and Communication Technology (ICT) industry have been heavily promoted as the new tool for the eradication of poverty. In many cases, ICT have been linked to have a positive effect on social and economic development, such as "social inclusiveness" and "inclusive capitalism" (Rashid, 2017); providing tele-communication service in rural areas in developing country that didn't had access to a telephone before. Other studies associate the ICT points out the increasing inequality between those who "have" and "have not".

There is an emerging consensus in social science that advocates the adoption of interdisciplinary and multi-perspective research approaches. However, there is little evidence to suggest that academia is responding to this growing trend of holism, namely in Information and Communication Technology for Development. In my search to understand what "development" is and to some degree the relationship between technology and development for developing countries, I have come across papers that are either for or against using technology for development, where the main critic for this trend has been that the existing theories lacks the capacity to describe and enlighten the complex phenomenon of development.

> *"This situation does not appear to stem from a lack of motivation or effort; rather, it appears to arise from an inability given the methodology of logical analysis rooted in the epistemology of rational reductionism as well as the ontology of realism-idealism separation, both of which lie at the core of the Western philosophical traditions" (Li, P. 2014, p. 3)*

[1] https://www.un.org/sustainabledevelopment/development-agenda/

Research Question

The purpose of this paper is to answer "Can yin-yang perspective contribute to the way we understand growth and development?" Especially in light of the contemporary development of technology and globalization? Where technology is playing an ever vital part in our life; from a simple phone call to analysing the next election in America; from a time where development is a linear progress to a more complex world view that have to account for human influence and connectivity. I believe that using paradoxical thinking and adding elements of dialectic thinking from Asian perspectives, where oppositions are not necessary always mutually exclusive, would be a complementary contribution to the existing understanding for development, in particular for Developing and Least Developing Countries (LDC).

Structure of the paper

The paper is structured as followed; First section: philosophy of science is introduced, enlightening the binary differentiation within the existing research philosophies, followed by a sub-section, introducing the methodology for Yin-Yang perspective. Research design and method is also discussed in this section. The Ontological and epistemology of Yin-Yang perspective is introduced later in the paper. Second section: literature review of ICT4D, with the purpose of identify some of the contradicting elements within the discourse. In third section, the concept of paradox and the principals of Yin-Ying perspective is introduced. Followed by section four, using case studies from Bangladesh to analyses the actual developmental impact of ICT4D. Lastly, concluding section includes a brief summary of the analysis with reflection of the limitations in this paper.

Philosophy of science

The binary opposition in research.

Up until the seventeen century; the scientist was known for investigating the nature, causes and effects of a *particular* thing or process, while the philosopher was concerned with the "nature" of reality, by asking "what is real?" (Winch, 2003). During the time of enlightenment, the age of scientific revolution, our understanding of reality was increasingly provided from a scientific and empirical view, where reality was definable and measurable (Scotland, 2012), using methods from nature science that previously had been considered unsuitable to study of social phenomenon (Winch, 2003). The nature of "what is real" have changed throughout time. At the time of Socrates, the reality or ontology was spiritual, mentally constructed and immaterial. Better known today as idealism, this philosophical views the "truth" as coloured or subjective through the perception of the viewer and only exist in the mind of the viewer. Others, such as from the teaching of Aristotle that later has formed the foundation for realism, where the nature of knowledge can be objectified and uses scientific methods to develop knowledge (Saunders, Lewis, & Thornhill, 2008). Realism and positivism both share this point of view on the nature of knowledge. Generally, positivism is focused on the measurable elements of nature, using empirical data to identify "universal truth", while in realism, namely, critical realism, the nature of knowledge is two folded. Critical realism argues that the events we experience are sensations, perceived through our senses and are therefore only a reflection of the real world (Saunders et al., 2008; Scotland, 2012; Winch, 2003).

More so, there in general distinguishes between realism and critical realism. Realism believes that an object can exist independent of the mind, hence reality can exist independent of the researcher and it can be measured and discovered, while critical realism also accounts for the human influence. Realism and critical realism share the same ontological believes that the "nature" of knowledge can be developed using scientific methods, while they differ in the epistemology, where critical realism believes in a socially constructed reality (Scotland, 2012) – realism believes in objectivity, where the researcher is independent from the thing he/she is investigating. In turn, realism and positivism share to some degree the same ontological view. However, in contrast to positivism, realism acknowledges a link between the world and our senses, where in positivism they are individual entities without any connection.

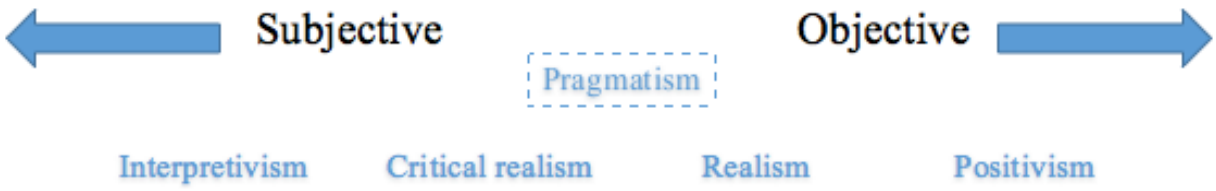


Figure A: shows the relative position of each research philosophy in relation to its ontological view

At the other end of the spectrum, interpretivism sees the world as subjective, in that our consciousness defines the reality; reality is individual construction – that a tree is not a tree, unless someone calls it a tree. In this view, reality does not exist independently from our knowledge of it.

> *"… knowledge has the trait of being culturally derived and historically situated. The interpretive paradigm does not question ideologies; it accepts them." (Scotland 2012, p.12)*

The scope of pragmatism assumes both the subjective and objective ontological point of view. Research conducted with an objective ontology tends to use data and facts or statistical methods to investigate social phenomenon, while research that is conducted using a subjective view, in general uses qualitative methods, such as in-depth interviews, focus group and open-question survey. However, in the view of pragmatism, the perception of reality is expressed in the researched element. In other words, pragmatism does not have a predisposition to the "nature" of knowledge, or the development of these knowledge, but contextualizes, in relation to the element in question.

In sum, of the five discussed philosophical views, aside from pragmatism, all see the nature of knowledge, or our reality as two oppositions; subjective or objective, using logical approaches to generalize and understand social phenomenon. Pragmatism, also known for its mix-method approach and abduction reasoning (Locke, Golden-Biddle, & Feldman, 2008), and arguably critical realism (Scotland, 2012), suggest various degree of dialectical thinking; the ontological view of reality here is not polarized as opposites – "either" subjective "or" objective, but complicated and interrelated. However, as Nisbett and Peng (1999) have pointed out, dialectical thinking is still constrained by the "law of formal logic", where the reasoning process tend to be linear and logical.

How science have formed the reality:

The debate for applying scientific method to study social phenomenon is as old as the written language itself. In Winch's "the idea of social science and its relation to philosophy" this long going debate is described in detail; the tension between science and philosophy, between "a priori" and

evident-based methods, wherein Winch has criticized the modern research practices that are increasingly relying on scientific methods to investigate social phenomenon, while discounting the philosophical aspect of reality. This is especially evident in the discourse of Big Data (or the Datafication of reality), where some scholars believe that Big Data can replace the traditional research approaches, in which the researcher is detached from the researched phenomenon, where the research philosophy, including ontology, epistemology and axiology are without any significance (Boyd & Crawford, 2012); using quantitative measurement of human behaviour to effectively solve human problems, analysing huge amount data to find patterns and form decisions (Gumbus & Grodzinsky, 2016). Data that is generated from social media platforms, such as Facebook and Twitter are popular today and are often used by government and private agencies to measure and predict human behavior[2]; make informed decisions that forms the basis for growth, to enhanced productivity and create value (Flyverbom & Madsen, 2015; Gumbus & Grodzinsky, 2016).

> *"... widespread belief that large data sets offer a higher form of intelligence and knowledge that can generate insights that were previously impossible, with the aura of truth, objectivity, and accuracy." (Boyd & Crawford p. 3).*

While some scholars view Big Data as the new source of knowledge, others caution against the simplification of reality, where scholars have questioned the validity of the data itself, in terms of data sampling bias, while others have investigated Big Data analytics and questioned the interpretation of the data itself. In the paper from Flyverbom & Madsen (2015), "Sorting data out", the authors have pointed out that data is always collected in past tense and gives a snapshot of an estimate of what goes on "the ground", where the data is generated. For example, data that is collected from Twitter is, in itself bias, due to accessibility; not all data is available for the researcher; Twitter only represent a specific demography of people; Twitter-users are mainly known to be located in the English speaking countries, such as US. In Denmark, Twitter is known to be used mainly within the social-political context. According to Zwitter (2014) Big Data analytics can be influence by these stakeholders; 1) the collectors – who determine what is collected and how long it is kept; 2) the utilizers – who define and redefine the purpose for the data, and 3) the generators – who inputs or records data either voluntarily or unknowingly.

In the discourse of Big Data, a new research paradigm have been suggested; that Big Data fundamentally differs from the existing research paradigms; instead of testing a theory by analysing relevant

[2] such as tweets from Twitter that can predict the result of a US president election, or Google - using people's search words to determent the flu pattern in 2009 (Mayer-Schönberger & Cukier, 2013)

data, Big Data analytics pursues to develop the knowledge "born" from the data. Traditional data analysis techniques have been designed to develop knowledge from small, static, clean and poorly relational data sets, where the data is generated and analysed with a specific question in mind. According to Kitchin 2014, Big data represents a new era of empiricism, where because of the size of the data sets, the data can be free of theory and hence speak for itself, better known as "End of theory". However, traditional research paradigms differentiate between research philosophy (ontology), epistemology, axiology, and methodology. While Big Data do offer new ways of processing the collected data, from a research paradigm perspective, data collection and analysis is only a small part of the research paradigm. More so, one of the main assumptions in Big Data is the objectivity of the data. This view is in line with a positivist philosophical stance, in which reality exists independently from us and that social phenomenon can be objectified and measured using methods within nature science (Kitchin, 2014).

On the other end of the scale, from a subjective philosophical perspective, Big Data as the replacement for traditional scientific approaches have been criticized within academia. Scholars such as Mayer-Schönberger and Cukier, Boyd and Crawford, Flyvebom and Madsen, have advocated against this simplified world view, where the fallacies are well-known.

> *"These studies often wilfully ignore a couple of centuries of social science scholarship, including nearly a century of quantitative analysis and model building. The result is an analysis of cities that is reductionist, functionalist and ignores the effects of culture, politics, policy, governance and capital (reproducing the same kinds of limitations generated by the quantitative/positivist social sciences in the mid-20th century." (Kitchin 2014 p. 5)*

No matter which field of studies one examine, division of two opposites are always present, some "for" and others "against"; in economic studies, liberal vs. conservatism, in development studies, socialism vs. capitalism, in philosophy, objectivism vs. subjectivism. ICT is only one study amongst many that are fighting internally for the validity of their research findings, where on one hand as ICT, possess the possibility for social improvement, while on the other hand creating even bigger social inequality (Kitchin, 2014).

Research design

In light of the contemporary development of technology and science (cloud computing, big data), where the underlying philosophy of science is increasingly being disregarded, is important to point out the existing bias in the basic assumptions of research philosophy, in terms of ontology and epistemology, where they are being polarized against each other in the search for the ultimate "truth".

However, not all existing research philosophy in the world is centred around a binary world view. The main purpose of this paper is to introduce the Eastern philosophy, based on the principles of Taoism, the Yin-Yang perspective offers a different way to create a holistic understanding for the contradicting nature of reality. More importantly, the Chinese paradigm does not negate the existing "Western" philosophies and methodologies, instead, it tries to unify them.

The Eastern research philosophy is defined as followed, "Tao" in Taoism forms the ontological view, Yin-Yang represents the epistemology, and "Wu" is the methodology, where the methods include balance and harmony for conflict solving. The details of the Eastern research philosophy will be explained in detail later in the paper.

However, it is recognized that Eastern research methodology is, at best, in its infancy and lacks the clear defined laws and rules for research approach and framework (e.g. Li, X. 2014, Li, P. 2012, 2014, 2016). This can be problematic in the light of validation for the research. Pragmatism, in many way, shares some of the fundamental principles of Yin-Yang philosophy, where ontology, epistemology and methodology is determent by their "fit" to the research question, where it is possible to work with a variations of epistemology, ontology and axiology, the philosophy adopted is viewed as a continuum rather than static and oppositional (Saunders et al., 2008). Similar, grounded theory offers a systematic approach for the construction of theory, where it is particularly helpful in the research to predict and explain behaviour, with the emphasis on developing and building theory. Grounded theory is a research approach that operates mainly inductively and is favoured in the case-based research. A study that is conducted using grounded theory starts with a question, or the collected data. In grounded theory, data collection starts without the formation of an initial theoretical framework. Theory is formed from data generated by observations, wherein the analysis is a highly interpretive process, and by its nature, it is messy and complicated. However, one main distinction is critical, while Yin-Yang philosophy seeks to build an integrative understanding of social phenomenon from ongoing debate of various opposing theories, the grounded theory either explores a novel theory or exploit an established theory. In other words, unlike the Western logic that seeks an ultimate, and non-contradictory resolution to conflicts, the Eastern philosophy believes in a permanently coexistent, yet continuously interactive state of two opposite elements. Yin and Yang embraces a paradoxical strategy that searches for a temporarily balanced, yet constantly changing harmony in conflict management.

In accordance with the method that Peter Li (2012) has proposed for the Yin-Yang method, literature review has been conducted multiple times. Initial review of the literature within the discourse of ICT

shows a vast of sub-disciplines that includes production of hardware, software, IT infrastructure (cloud computing) and data analysis (Big Data), just to name a few. Cloud computing is relevant in terms of business operation and as a new innovation that enables global connectivity as well as public infrastructure. As late-comers, emerging economies have the unique opportunity to imitate the e-infrastructure of developed economic and hence fast pace their own development. Big Data is relevant in terms of the increasing ahistorical interpretation of world, where with enough quantity of data, Big Data becomes superiors, in contrast to the traditional research approaches that are obsolete and out-dated. In combination, cloud computing and Big Data show the trend of technology that is bit by bit forming a new world (view). In the second round of literature review, I found that in the discourse of ICT for development, most of the research that has been conducted focus on the technical factors for either implementation of technology or the usage of it, without considering the development context. This strikes me as odd, as most researches assumes that developing countries have the same point of departure as developed countries, here I refer to the institutional theory that explicitly investigates the deficiency within the society, how the lacks of institutions can promote or inhibit progress. As the last round of review, case studies are found. One of the most known research done from ICT4D point of view is the Grameen phone project in Bangladesh, which have been the "poster boy" for ICT4D since 2006, when the project first began. Rashid (2009) was one of the researchers that initially followed the project in 2006. As late as this year, he published another paper about Grameen in Bangladesh. In contrast to his paper from 2009 that investigated ICT4D from a business/economic perspective, he has shown an increased understanding for the relational aspects of development, namely the complexity.

Furthermore, I have chosen to include some sections from my previous work with institutional theory and social entrepreneurship, which in highly relevant, but out of the scope of this paper. (appendix 1)

Finally, this paper is a reflection of my collective academic learnings from CBS, in an afford to combine the learnings of holism from Bachelor years(ASP), and the more in-depth knowledge acquired from the master studies, including the courses of CSR, Cloud Computing, Datafication and entrepreneurship. In my view, separately, these studies only reflect a partial picture of our reality, but combined, they can provide a more sophisticated view of the complexities that exist.

Literature review

Information and Communication Technology for development (ICT4D)

Information and Communication Technology for development (ICT4D) is one of the newly emerged field of research that is derived from technological innovations. As the name prescribes, this field of study investigate the developmental impact of technology. The definition of ICT has change throughout time. At digital-technology's infancy, ICT is viewed, from a communication point of view, as a tool for transfer and mitigate information (Heffernan, Lin, & Thomson, 2016). Today, Information and Communication Technology (ICT) represents all forms of electronical computing systems, telecommunications and networks that collect, process, store and distribute information (Alias, 2013). As ICT is a fusion of digital innovations, the research into its impact on society is a convergent of studies; including the studies of information systems, organization, network, communication and development. Each of these studies contribute in different ways to the understanding of ICT for development.

From a historical view, the study of Information System (IS) is one of the earliest studies into the influence of digital enabled technology in organizations. In the 1970's and 80's the main focus of the field is the improvement of organizational effectiveness (Ives & Learmonth, 1984), by structurally change the way of we conduct business. More so, the digital technology has enabled a new form of connectivity that goes beyond the geographical borders and traditional boundaries. The notion of "information society" is derived from the increase of connectivity in developed economy (North America, Europe). It is against this backdrop of increasing connectivity; ICT researchers and practitioners are moving their focus from access to the use of ICT services (Ahmed Tareq Rashid, 2017); where the underlying assumption is that ICTs can promote human development in terms of health, education, political participation, and economic conditions; fostering opportunities for the poor (Marszk & Lechman, 2017). These technologies have proven to overcome geographical, infrastructural and financial constraints and can be used by anyone regardless of the location and income status. In other words, ICT offer users from low-income and low-skilled societies opportunities to benefit from the global information and knowledge flows (Alias, 2013; Marszk & Lechman, 2017).
Rooted in the belief that Internet enabled connectivity is the most effective and efficient way to gain economic development, digital inclusion refers to the access and ability to use digital equipment, with an explicit focus on marginalized populations (Ahmed Tareq Rashid, 2017). Rashid 2017 points out; digital inclusion is not only about physical access to an ICT product, but also the ability to use it. Debates on inclusion have evolved from a focus on poverty alone toward an understanding of the

causes and consequences of social (dis)advantages such as capability, resources, human rights, and social participation (Ansari, Munir, & Gregg, 2012; Qureshi & Kamal, 2011). For a long time, national development has been solely indicated as economic welfare at the macro level. However, a growing acknowledgement within the field of development is moving away from solely using economic indicators, to also include human factors. Amartya Sen (1999) argues that the economic well-being of the poor is best understood through their capabilities, such as choice and desire fulfilment. This led to the capabilities framework for the evaluation of individual wellbeing, an approach that departes from traditional welfare approaches typically associating wellbeing with wealth (Ansari et al., 2012; Sen, 1999). Today, Sen's capability approach, is one of the most recognized and utilized method to investigate human development that focus on individual's capability (Sen, 1999). While digital inclusion investigates the access and ability to digital equipment, social inclusion investigate how ICT can promote human development, by increase the material wealth of the poor. It is expected that a high level of digital inclusion will lead to social inclusion (Ahmed Tareq Rashid, 2017). As the poor acquire and develop more capabilities, they may be able to take advantage of economic and social opportunities. However, capability building is no easy task. In many developing countries, the poor are often isolated from the necessary resources and with inadequate formal institutions, they are left with little help to improve their current living conditions (Rai, Harindranath, & Liebenau, 2013). ICT is therefore viewed as an enabling tool for the developing economies to move forward despite the continuously challenges of weak institutions, poor governance and insufficient infrastructure.

ICT and poverty alleviation

In today's business setting, the use of ICT services is becoming an increasing vital part of the firm's infrastructure, where digitization and e-business seems to be an unavoidable path to walk (Zott, et al, 2011). E- business is generally a term used for describing businesses that operate around the Internet and the term is increasingly been used to describe firms that are "doing business electronically", which includes e-commerce, e-markets, and Internet-based business and refers to firms that conduct commercial transactions with their business partners and buyers over the Internet (Zott, et al, 2011). The rapid development of e-business requires the involvement of ICT into the organizational architecture and business model. As a result, the development of e-businesses and industry will be significantly influenced by the availability of ICT. From an economic point of view, Small and Medium-sized Enterprises (SMEs) are increasingly been recognized as a focal point in shaping the economic

development. In Europa, the European Commission considers SMEs as the key to ensuring sustainable economic growth, innovation, job creation, and social integration. From this resource-based view, knowledge is an important intangible resources that can be the source of a sustainable competitive advantage. Knowledge permits the firm to forecast a more precise picture of the nature and the potential changes in the environment and adopt the appropriate strategic and tactical actions accordingly. Without such knowledge, an organization is less capable of discovering and exploiting new opportunities.

Previous researches suggest that adopting ICT services have the potential to leverage some of the traditional disadvantages that SMEs face, such as market entry and access barriers (Lacity & Reynolds, 2014; Ross & Blumenstein, 2015). According to Lacity & Reynolds (2014), SME, including micro-enterprises and sole proprietorships, have limited information system management capacity, few IT skilled employees and low financial capital, which cause SME to have a generally slower IT adopting rate, in comparison to larger firms. While the general trend in IS literature supports the adoption of ICT technology by SME, However, in practice, this is might not the case; specially for micro- enterprises or Bottom of the pyramid (BoP). In a study by Qiang et al. (2006), only 27 percent of microenterprises use e-mail and 22 percent use Web sites to interact with clients and suppliers. They further found that not all microenterprises benefits from IT implantation.

In another study, where Bharati and Chaudhury (2006) surveyed micro, small and medium manufacturing firms in Boston metropolitan area and found that even in the developed country context, most of the microenterprises were not aware of the technologies that could be used for improving their business performance. As Qureshi and Kamal (2011) point out; the adoption motivations for IT services dependent upon a combination of economic, social and human factors, all which are limited in the case of microenterprises and BoPs. The BoP approach suggests that by applying market logic in low-income communities; business corporations may contribute to significantly reduce poverty and radically improve the lives of billions of people, not only by selling affordable products and services to low-income customers, but also by giving them employment and business opportunities (Khavul & Bruton, 2013). The central focus in the BoP approach is that poverty eradication is reconcilable with a profit-maximizing objective within an enterprise-based market system. In rural Bangladesh, Grameen Telecom have piloted a wireless project, lending up to 175 dollars to what later was known as “the wireless women of Grameen”. Once equipped and trained, these BoP entrepreneurs could sell phone usage on a per-call basis to other villages. These BoP entrepreneurs was given a loan covered that would cover the cost for mobile phone, solar charger and training for the use of service and

equipment. In average, these women were able to increase their yearly income by 300 dollars, where this additional income was spend on children's education and healthcare (Hart & Christensen, 2002). This new business model allows the local entrepreneurs to earn better incomes by selling ICT products and services within value a chain of a multinational enterprise, where employment and income-generating opportunities for marginalized and vulnerable groups, such as women are in focus (Blowfield & Dolan, 2014). Similar, in a study by Esselaar et al. (2007) investigated SME in 13 African countries in terms of their ICT usage and impact. They found that ICT contributes positivity to the revenue generation and labour productivity.
However, a growing number of scholars have questioned the key assumptions underlying this BoP proposition and the role of business in poverty reduction, where the marketizing of social welfare is seen as a "curtain" that masks unequal power relations that will bring neither profitability for corporations nor prosperity for the poor (Ansari et al., 2012).

In today's society, where the information and knowledge are of vital importance for the purpose of development, ICT plays the role as an enabler of development in several aspects, taking the society towards the development of information society. Following this view, societies that lag behind in terms of the technological development are therefore viewed as isolated and excluded from the economic, social, and other types of developmental activities; as the digital inclusion will lead to social inclusion, the exclusion from technology will inevitably lead to social exclusion (Gorica, Kordha Tolica, & Sevrani, 2015). In addition, Heeks (2002) observes that there is a big difference between ICT integration and use between developed and developing countries. Using statistical measurement method, the ICT development Index (IDI), measures the level of ICT development, progress in ICT development, differences between countries with different levels of ICT development, and the development potential of ICT. It combines 11 indicators related to three categories; Access, Use and Skills, where the IDI weighs the first two categories by 40 percent and the third by 20 percent (Dobrota, Jeremic, & Markovic, 2012). According to the IDI, European countries score generally high on the IDI, due to their high Internet penetration rates, where smart phones and computer are commonly accessible. On the low end of the IDI ranking, developing countries, such as Angola, Nigeria, Senegal, Pakistan and Mozambique are found (Dobrota et al., 2012; Sumner, 2012), which are the poor countries that are playing catch-up to the rest of the world.

This uneven distribution of ICT development has given birth to the phenomenon "digital divide" or "information poverty", where access to information is increasingly been viewed as utilitarian, at the

level as the access to clean water or healthcare (Kshetri, 2010, 2016). Traditional access-oriented thinking focused on issues related to the measurement of ownership, availability, and affordability of infrastructure, where the emphasis is on single-factor, or monotopical relations rather than an integrative frameworks of multiple measurement indicators (Avgerou, 2008; Barzilai-Nahon, 2006; Heeks, 2002; Walsham, 1995). According to Barzilai-Nahon (2006), there are two ways of approaching the measurement and analysis of the digital divide: through atomic and monotopical lenses or through holistic and comprehensive lenses. The monotopical view is used frequently by policymakers that gravitate toward this technologically deterministic approach; firstly, benchmarking the ICT access is easy to measure; secondly, its easily understood by the public, by simplifying complex situation into an "objective" comparative tool, where the benchmark is set according to the lowest common denominator, disregarding the economic, social and political background (Avgerou, 2008; Barzilai-Nahon, 2006; Walsham, 1995; Wilson, 2002). Furthermore, as Barzilai-Nahon (2006) points out, these benchmarks are typically developed in technologically advanced countries and suffer from the problem of "highest common denominator," and hence may not be appropriate for countries that are technologically underdeveloped.

ICT and development

Avgerou (2010) pointed out; ICT4D is torn between two orientations; universalistic vs. situated perspective on development. Universalistic perspectives investigate the value created by ICT and the processes of information system (IS) innovation, where value can be realized in terms of general economic approaches (Avgerou, 2010), following the liberal view for economic development, where supply and demand produces an upward growth spiral which enables an economy to break out of the cycle of underdevelopment. In contrast, situated perspective consider ICT as created by social actors and tend investigate the cause and effect of ICT innovation (Avgerou, 2008). In the discourse of ICT4D, the notion of development represents the ontological view of the research, how the researcher view development, as a form of survival, (conservatism) or do they see development as positivistic progress (liberalism)?

Currently, the information and communication technology have been advocated by international organizations, such as UN, for poverty alleviation. Key players promoting ICT for development include UNESCO, World Bank, ITU (International Communication Union) and other national based agencies,

such as International Development Research Centre(IDRC) in Canada and Swedish International Development Cooperation Agency(SIDA). The concept of businesses[3] or an industry of businesses, can in cooperation with governmental agencies, act as development agents, improving the living standards for the poor in developing countries, can be traced back to the postcolonial period (Blowfield & Dolan, 2014). It is in this time, under influence of liberalism and fuelled by globalization, the businesses through their economic activities have contributed to economical, societal, and political development; have later become *sine qua non* for developing countries to follow. This liberal developmental view is also known as the "Washington Consensus". The "Washington Consensus" was introduced in the 1980s and was quickly adopted by the mainstream to explain the process of development (Gore, 2000). Based on historical analysis of economic and social changes in developed economies, these changes were expected to reoccur, under the "right" political management; the transformation from traditional (rural, agricultural) society to a modern (urban, advanced, industrial) society (Gore, 2000; Moodley, 2005). However, it is during this time, with aid from technological innovations, the mainstream research shifted from a historical to an ahistorical analysis, where "poverty" became measurable and societal development is uni-directional, progressive (Berger & Luckmann, 1966; Gore, 2000).

From a theoretical point of view, the "Washington Consensus" is a development policy based on the liberal and principals that advocate for open-markets through privatization and globalization (Gore, 2000). These liberal principals are discussed in detail by Preston (1999). In his paper, he describes the fundamental view of development, where the developed countries are the origin of "development" and the developing countries can, by adopting the Western knowledge and recapitulate the same development process as of the developed world. In other words, the developed countries are setting the example that the rest of the world should follow (Kiely, 1999).

> *"Positive social scientific knowledge was Western, and the recipients in the Third World were taken to be essentially passive consumers of the proffered schemes…. that the First World ought to help the Third World was taken to be an ethical injunction …" (Preston, 1999 p 4-5)*

This ethical injunction has been pointed out in several studies, including the study of development, Corporate Social Responsibility (CSR), and as well as in ICT4D, where Thompson (2005) criticized the ICT4D discourse for its hidden political and economic agendas of Western domination. The study of CSR, based on the liberal principals of development, aim to improve the world, centering mainly

[3] a conceptual category that embraces any organization engaging in commerce and trade.

around the social and environmental conditions in developing countries. CSR, as the name describes, is the private sector's social responsibility, while development study aims to influence strategy and policy at governmental level. Most research conducted in the name of development follows the liberal principals, where progress is defined by the various economic performances and everything is under the scrutiny of the rules and discipline of the free market. As with other disciplines that follows the teaching of liberalism, it wants to quantify and define our reality, generating universal "truth" (Kiely, 1999).

In sum, the dual nature of ICT4D can be found in all level of analysis, regardless on the global or local level. From a societal point of view, ICT promotes economic development for some, while marginalize others, where there distinguishes between information "have" and "have not". In terms of business, this binary approach results in either the success or failure for economic growth, while on the personal level, the access to ICT is equal to the alleviation from poverty.

Introducing Paradox

Composed of the Greek words "***para***" for "past" or "contrary to" and "***dox***" for "opinion", "***Paradox***" have intrigued some of the most famous philosophers and scholars throughout time.

"only the wise man is truly free and the foolish person is a slave" (Cicero, Paradoxa Stoicorum)

According to Cicero, understanding paradox is a part of the Socratic way of argumentation, where method of hypothesis elimination is used to identify and eliminate hypothesis that lead to contradictions (Spies, 1999).

The studies into paradox have deep theoretical roots and foundations in philosophy and psychology that include the works of Aristotle, Confucius, Freud, Hegel, Jung, Kierkegaard, and Lao Tsu. A common view among these philosophers is the paradox of the human existence is caused by tensions between "life and death", "good and evil", "self and other" (Berger & Luckmann, 1966).

In psychology, the paradoxes within the human mind has been examined to understand the cognitive and emotional approaches to interdependent contradictions. Jung conceptualized the two sides of the "self" as a paradoxical unity, "conscious" and "unconscious", where mental health can be achieved by embracing both opposites. "love – hate", "trust – distrust", "dependence – independence" (Schad, Lewis, Raisch, & Smith, 2016). According to Jung, these antinomies can be described as light and shadow, where the light enables shadow, and shadow cannot exist without light (Jung, 2014). In psychology, the tension created by opposing elements can under some conditions foster creativity, while in other cases the tensions generates anxiety, avoidance and other counterproductive behaviour (Nisbett & Peng, 1999). There are four possible psychological responses to contradiction. *Denial*: when the contradictions are not being deal with, or pretending they do not exist. *Discounting*: discounting or distrust the contradicting information. *Differentiation*: comparing the contradicting information, in order to determine the "right" from "wrong", *Dialectical thinking*: accepting the existence of contradictions, where opposing elements all contain some parts of the "truth" (Paletz, Bogue, Miron-Spektor, & Spencer-Rodgers, 2015).

It is recognized in psychology that decision-making, creativity and innovation are positively associated with dialectic thinking that apply multi-dimensional perspectives to combine seemly opposite elements to generate new and perhaps more suitable solutions (Nisbett & Peng, 1999). More so, in psychology's dialectical thinking, contradictions are viewed as a temporary occurrence that are to be replaced by integrated thoughts or synthesises, which are considered higher levels of cognitive function.

From the ancient Greece Aristotle founded what we known today as formal logic, consists of two contrary or even contradictory propositions that investigate the ontological distinction of "being" and "non-being", while Socrates, in his search for truth, discovered the dialogical method – where the ultimate truth surfaces by adjudicating competing demands (Schad et al., 2016). The Socrates' dialogical method is one of the oldest recognized and favorited method for solving paradoxes, involving the following three stages; a *thesis*, which entails one set of facts supporting a hypothesis; the *antithesis*, which are opposite facts supporting a contradictory hypothesis; and the *synthesis*, which unifies and combines the thesis and antithesis, which in sum, are the foundation for dialectical thinking. Marx and Engels are among the scholars that have used this method in their analysis of our society. For example, the destruction of capitalism can be viewed as a process of change over time, where the synthesis itself becomes a new thesis, and in turn producing a new antithesis and hence a new synthesis (Nisbett & Peng, 1999; Paletz et al., 2015). These scholars and many since, have contributed in many ways to our understanding of our society and specifically the way we conduct research.

The origin of paradox?

> The Ruler of the Northern Ocean was Shu (Heedless), the Ruler of the Southern Ocean was Hu (Sudden), and the Ruler of the Center was Chaos. Shu and Hu were continually meeting in the land of Chaos (混沌), who treated them very well. They consulted together how they might repay his kindness, and said, "Men all have seven orifices for the purpose of seeing, hearing, eating, and breathing, while this (poor) Ruler alone has not one. Let us try and make them for him." Accordingly, they dug one orifice in him every day; and at the end of seven days Chaos died. (trans. James Legge)

How do you, as the reader, understand this allegory?
Surely it was better that Chaos should be replaced by another state. Did "Heedless" and "Sudden" do a bad work, by eliminating Chaos? James Legge was one among the first to translate the ancient text from Tao, and unfortunately also one of the first to misunderstand the teachings of Tao. This allegory represents the fundamental view for the discursive knowledge of human interactions in the Chinese philosophy.

In the West

The word Chaos originated from the Greek word "khaos" that can be translated into "gap", "void", where the fear for abyss, empty space, and infinite darkness have had a longstanding influence in Western philosophy. In a time before Christ, the Babylonian described Chaos as a (female)monster, from which "man" was created. In this allegory, Enuma Elish, a demoness by the name of Tiamat was defeated by the warrior Marduk that divided her carcass and formed the stat of Babylon. This allegory assumed and established male value over female, light over darkness, the known over the unknown, and good over evil. Here Tiamat was portrayed as a source for chaos, a force that sought to dissolve all living things into a silent slumber. More so, in this Babylonian story, the warrior Marduk took arms against Tiamat, where even the gods were powerless. For this act, Marduk demanded superior authority, and created the race of "man" to protect the temples that Marduk had built (Eoyang, 1989). Aristotle, the father of *locus classicus,* advocated for the understanding of principles as determinants for the sources of order. The principle (arché) is: that from which a thing can be known; from which a thing first comes to be (origin). As the principles of knowledge, the beginnings are the origins of thought (consciousness) (Hall, 1978). Chaos is a term for the primordial condition, or as Sardar (1994) puts it; an anti-condition, which the world as we know it, the human existence and thought originated from. It represents all that is not ordered, beyond the confinements of the ethos, ideology and philosophy. In Sardar's view, Chaos is the antithesis to all knowable things in life, where the world, as we know it today, is the world after Chaos. Following this view, Chaos is seen as anarchical and destructive and needs to be controlled and eliminated (Hall, 1978; Sardar, 1994). In general, Chaos, in contrast to cosmos, is viewed as non-rational, lawless and unprincipled; it is anarchy without predetermined source of order, hence without origin.

Christianity have also contributed to the current understanding of Chaos. "In the beginning God created the heavens and the earth" (Genesis 1:1). The Bible describes the process of creation, where God created all from Chaos; the heavens, the earth, the all the living beings, where we human, as a part of God's creation can only discover and observe things that God have made. In Christianity, Chaos is a symbol for nothingness, where only in the hands of God, nothingness can become something, hence Chaos, in itself is insignificant. Similar, in ancient Greece, creativity is a divine act of the Muses, where we humans play the role as the conductor of divinity (Hall, 1978; Niu & Sternberg, 2006; Sardar, 1994). Following this view, the ontology of the world is that objects and things exist independently from humans.

From the East – the Eastern philosophy of wisdom

The passage from above is a translation of the Taoist book, Chuang Tzu, chapter seven, the creation of the world. In this chapter, the creation of the world is not portrayed as epic as the biblical or the Babylonian creation of world, but as anecdote or an illustration of the paradoxical nature of reality. In contrast to Western view, Chaos is portrayed to be a part of the nature of things, unbiased and directly translated from Chinese "混沌" (hun-dun), meaning unclear and describes a state of blurriness (Eoyang, 1989; Hall, 1978).

> *"Nor is Chaos presented as malevolent and vengeful: here, hun-dun is characterized as generous. Indeed, his generosity is repaid with death – reflecting the modern truism, "no good deed goes unpunished" (Eoyang 1989 p. 273)*

Following abovementioned view, Peter Li (2016) pointed out the fundamental differences in the ontological understanding between the East and the West. In comparison to the Western binary view of reality, Taoism does not polarize between the "reality itself" and the "constructed reality", but accepts both as they are in their nature state and embraces the complexity that follows (P. P. Li, 2012, 2016; X. Li, 2014; Shen, 1995). Here, the complexity refers to the ontological questions of "being" as well as the temporary and dynamic process of "becoming". More importantly, in the Taoism, the reality is understandable, but that does not mean that it can be spoken. Language, from a Taoist point of view, is a human construct that has its limits in describing the reality. Wittgenstein once said "that which cannot be said should be kept in silence". Taoism will add, "that which cannot be said is still understandable, so it should be shown instead" (Shen, 1995).

In Taoism, the world is constructed of the "reality itself", the "manifestation of reality" and "human beings" as co-related and interdependent. Human being is viewed as a part of nature, at the same ontological level as other living things (plants, animal), where our understanding of the nature of reality is not predefined by technical inventions (Shen, 1995). The Chinese word Tao (Way, 道) means the essence of the fundamental orders of the universe, where the "Tao" refers to the unity of "Heaven-Human Integration"(天人合一), as the common ontological foundation for all Chinese philosophy, where the reality is both objective and subjective in balance and not separated as in dualism or dichotomy. Furthermore, in "Tao" the macro and micro level analysis needs be combined in order to reflect the spontaneous, fluid and nonlinear process of "becoming" in the context of chaos and the dynamic reality of nature (Hall, 1978; P. P. Li, 2016; Shen, 1995). In Eastern philosophies, the nature reality is paradoxical, and complexity is a part of a desirable process, and not something that should be avoided (P. P. Li, 2016).

Introducing Yin-Yang:

The yin-yang image, arguably one of the most recognized symbol in the world, it is made of a circle equally divided by the curved line in the middle; black from white, and they represent the two opposite dynamics in the cosmos. The Yin-Yang is the Chinese cognitive frame that embraces and balances opposite elements both as conflicting and at the same time, complementary (阴阳相生相克).

Yin embodies the female elements, such as the moon, night, water, weakness, darkness, mystery, softness, and passivity, whereas Yang represents the male elements (the sun, day, fire, strength, brightness, clearness, hardness, and activity). In addition, Yin is associated with "non-being", while Yang is connected with the conditions of "being", where the "Tao" is the totality of both Yin and Yang. The symbol for Yin and Yang, represents the complementary nature of two opposites, their mutual dependency, and their interdependence and illustrates the Eastern view of the nature of reality that is constantly changing and transforming in a harmonious and balanced fashion (Chae & Bloodgood, 2006; Fang, 2006, 2012). The Yin and the Yang balances between the exchange and synergy between contradicting elements, and supports uncertainty from two key dimensions; holistic ambiguity (i.e., multiple perspectives) as well as temporary dynamic unpredictability (i.e., spontaneous, fluid, and nonlinear emergence) (P. P. Li, 2016), with paradox as an integrated part of the reality. This differs fundamentally from rational logic in Western epistemology as it is framed in Aristotle's formal logic and Hegel's dialectic, where it neither reconciles nor repels each other, but attracts each other to form a composite whole. In short, Yin cannot exist without Yang, they complement each other, create and reinforce each other. Yin and yang, water and fire, the moon and the sun, are coming and going, opening and closing, all in the process of constant change and transformation.

> *"Yin-Yang philosophy points out that any object in the world is ontologically composite; that is, a combination of two opposites (i.e., yin and yang), and nothing is so pure or categorical that it is pure yin without yang or pure yang without yin. Epistemologically, Yin-Yang philosophy maintains that we can and should always see both opposite elements coexisting within any object (Li, X. 2014 p. 10).*

Figure B: the ever changing dynamics of Yin and Yang

The Chinese word Tao (Way, 道) means the essence of the fundamental orders of the universe.

The Chinese methodology "Wu" (悟 or 悟性"Wu Xin") represents the intuitive imagination for insight via metaphor, where "Wu" is the Asian path for thinking outside the box, a divergent cognitive process, much more radical than simply the generation of new ideas, in which the mind gets free from the cognitive entrapment(experience, culture), by stepping back from the observed problems and explore new perspectives. This approach explores the limitation of logical frameworks, by endorses both ontological complexity and epistemological uncertainty. In contrast to the intellect-based and logical approach for analysis, the consciousness, mindfulness-based approach of "Wu" functions as the anchor in the Eastern paradigm of creative cognition for knowledge exploration in a non-linear context. The Eastern paradigm for "Wu" is largely for creative problem solving and decision making, while the Western paradigm generally emphasizes on critical confirmation, where the knowledge development focus on path-dependent proof or extension. Peter Li (2012, 2014, 2106) argues that "Wu" (悟) is the methodology of Chinese philosophy of wisdom that can be applied in conflict solving. However, Xin Li (2014) points out in his research that it is debatable whether Chinese philosophical tradition has a fundamental methodology that concerns with the procedures for information and knowledge development. In general, the methodology defines the procedures of scientific inquiry in a particular field, which specifies methods, rules, and postulates, where the *methodology* outlines research strategy that is to be undertaken and identifies the methods to be used in it. These *methods*, described in the methodology, define the approach for data collection and the interpretation of the data. From this point of view, is arguably that Chinese philosophy, regarding methodology in the western sense, can be view as underdeveloped and ill-defined, where "Wu" provides none or inadequate standards for operating procedures.

The nine view of contradictions:

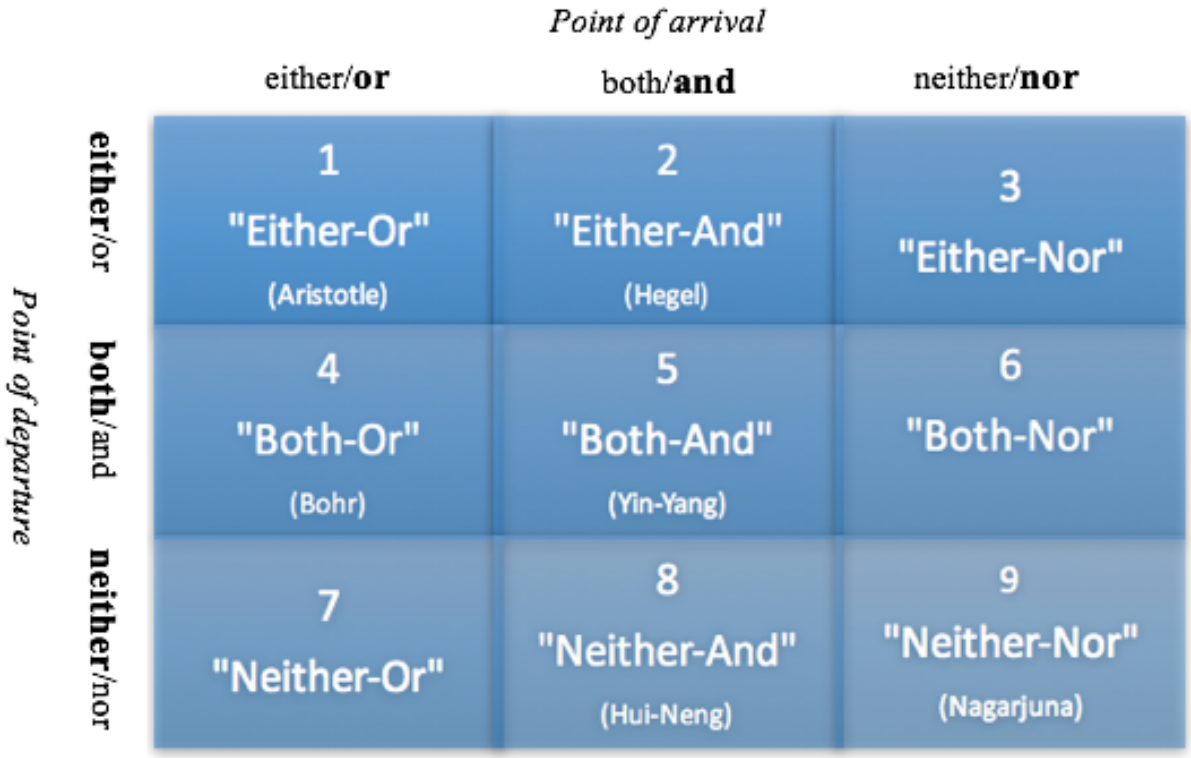


Figure C: a logical system of contradictions (LI, Worm, & Xie, 2015)

Figure C shows an overview of the similarity and dissimilarity of the different perspectives on paradox. The first horizontal line of boxes, reading from the left, "Point of departure – either/or", shows that both Aristotelian and Hegelian perspective on paradox view opposites as mutually exclusive, while Bohr and Yin-Yang, the second horizontal line of boxes, both acknowledge paradoxical elements as interrelated. As the horizontal line indicates the different perceptions for contradicting elements, the vertical line indicates the manner these elements are being processed. For example, in Bohr's view, the elements must be managed carefully separately, which is in contrast to the Yin-Yang- philosophy, where the elements are intertwined and mutually inclusive.

The most common views are:

"either-or" Based on Aristotle's law of logic, the "either-or" view of contradiction is described by: "the law of non-contradiction", "the law of identity", and "the law of the excluded middle". In this logic, the law of non-contradiction states that "the same thing cannot both be true and false at the same time". In the law of identity, each thing is identical with itself and possesses a unique set of characteristics, while the law of the excluded middle expresses that any statement is either true or false. From this perspective, contradictions are mutually exclusive and the process is linear and logical. (Nisbett & Peng, 1999).

"either-and" Based on the Hegelian dialectical thinking. In this view, "thesis" and "antithesis" represent the two oppositions that is resolved by synthesis, which contains parts of "thesis" and "antithesis" and yet is different from them, hence Hegel's trilogy of "Being-Nothing-Becoming". In comparison to the "either-or" perspective, an "either-and" perspective acknowledge the possibility of simultaneously existing contradictions (Paletz et al., 2015).

"both-or" Based on Niels Bohr principle of complementarity, the "both-or" perspective sees contradictions as mutually exclusive, yet complementary, coexisting, inseparable and must be carefully managed (X. Li, Worm, & Xie, 2015).

"both-and" Based on the Chinese Yin-Yang philosophy, the "both-and" perspective clams that contradiction exist in everything and that every object ontologically and epistemologically are a combination of two opposite elements or forces. Li, Worm, & Xie (2015) points out that every human beings contain both oestrogen[4] and testosterone[5] and it is the level of the hormones that defines the sexual appearance of a person, hence according to this logic; "the difference between male and female is in degree not in kind." (Li, Worm & Xie, 2015 p. 8)

In addition, the **"neither-nor"** is based on Indian Buddhist philosopher Nagarjuna's Madhyamaka philosophy, similar to the deconstruction philosophy that critique or reject all, without any solution been offered in return. Similar, based on the Chinese Zen Buddhism, philosopher Hui Neng offered a slight different perspective. According to the **"neither-and"** logic, all propositions are rejected, instead to be replace by another that may contain or use both earlier proposition in a different context. Li, Worm & Xie (2015) pointed out that "Charles S. Peirce's abduction logic" negated both induction and deduction reasoning for hypothesis development, only to use them later, as they are, to test the findings from the abduction process. The remaining three perspectives are mainly studied within the science of semantics, the authors Li, Worm & Xie (2015) give the following examples:

"both-nor" - "Jack of all trades, but master of none"

"neither-or" - "the lesser of two evils"

"either-nor" – "what other people think of you, it is none of your business"

[4] "the primary female sex hormone… It is responsible for the development and regulation of the female reproductive system and secondary sex characteristics." source wikipedia

[5] "the primary male sex hormone… In men, testosterone plays a key role in the development of male reproductive tissues such as the testis and prostate, as well as promoting secondary sexual characteristics such as increased muscle and bone mass, and the growth of body hair." Source wikipedia

Analysis – paradox in ICT4D?

The rural phone program in Bangladesh:

In 2006, GrameenPhone Ltd., one of the largest mobile phone company in Bangladesh initiated the community information centers (CICs), with a vision of bringing Internet and information based services to the underserved rural community in Bangladesh. GrameenPhone is a joint venture between Telenor AS of Norway and Grameen Telecom – a subsidiary of the Grameen Bank, known for its microcredit projects. Bangladesh today is categorized as developing country that aside from political instability, immature formal institutions and underdeveloped infrastructure, also is struggling with a rural area with significant BoP population. In an attempt to bridge the digital divide in Bangladesh, governmental and private organizations have come together in establishing the Community Information Centers (CIC).

According to the World bank Bangladesh has made substantial progress in reducing poverty. Based on the international poverty line of $1.90 per person per day, Bangladesh reduced poverty from 44.2 percent in 1991 to 18.5 percent in 2010, and is projected to decrease to 12.9 percent in 2016[6].

While, there is no doubt about the positive effects of ICT, in general, for the improvement of living conditions (Ahmed T. Rashid & Rahman, 2009; Ahmed Tareq Rashid, 2017), some limitations and barriers have been pointed out. There are differences in facilities and usage among CICs, including the level of initial investment, where some CICs, due to financial constraints chose to provide other non-Intemet based services, such as photocopying, fax, and CD burning (Roldan & Due, 2012).

Islam and Tsuji (2011) have pointed out the challenges for CIC in Bangladesh:

Poor literacy rate	Lack of education - low literacy is a big problem in rural areas.
Language barrier	The national language of Bangladesh is Bengali, with low literacy rate most people cannot understand the English, which is predominant language on Internet.
Lack of relevancy in content	Only few local content providers are creating Bengali web pages and sites for the community people.
Low ICT literacy	Computer operating skills and internet navigation is still low in rural Bangladesh. Some rural people feel awkward to use CIC.

[6] http://www.worldbank.org/en/country/bangladesh/overview

Inadequate ICT infrastructure	General low connectivity, slow connections.
Inadequate physical infrastructure	Bangladesh is facing huge electricity problems. An unreliable supply of electric power is another barrier of providing ICT-based services to the community people.
Financial constraints	Initial investment for the establishment of CICs, including fixed cost, such as rent, general maintenance, and the education and training for staff. Aside from these, internet browsing charges and other service charge still seems expensive for the CIC users.
Lack of governmental strategy	Lack of cooperation between government and private agents, apart from the initial support during the establishment. Information provision is at the lowest priorities.

Above mentions challenges can be summarized into ICT adoption related issues, from both micro and macro perspective. From the micro perspective: the user's level of education, in terms of ICT knowledge and general education, language skills, personal income and more importantly age (Rahman, Taghizadeh, Ramayah, & Alam, 2017; Ahmed Tareq Rashid, 2017) of the users are limiting a higher ICT penetration rate. In combination with the macro perspective, where the physical infrastructure of the country is at its infancy; Borrowing from institutional theory, inadequate formal institution, including access to finance, formal education, and the lack of physical infrastructure, such as water and power, makes the distribution of ICT empowered development uneven.

Identifying paradox in Bangladesh's ICT:

In the search for studies investigating ICT for development in Bangladesh, only few articles were found. In the review of case studies from Bangladesh, Islam and Tsuji (2011) is using a descriptive method to understand the impact of ICT in Bangladesh. Rashid and Rahman (2009), Roldan and Due (2012), from a business opportunity point of view, using BoP approach to understand invest motivation and market opportunities for Multinational enterprises. Torero, Chowdhury and Galdo, (2003), Forestier, Grace and Kenny, (2002), both paper, are using empirical data to support the positive development impact of ICT in Bangladesh. While Ahmed, Hossain and Ferdous (2014) found in their paper that a gap between ICT industry and the users (both private and governmental).

It is important to acknowledge that in the discourse of ICT4D, none of the articles in the initial literature review and the current review of ICT4D in Bangladesh have utilized the vast knowledge from either institutional theory or theories involving social capital and entrepreneurship.

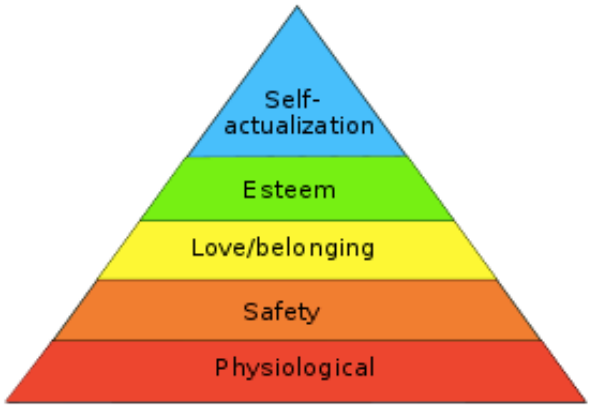
Institution theory describe the society in terms of resources and capabilities, namely that developing countries are known for its inadequate formal institutions, also known as the "institutional void". In the case study from Martí & Mair (2006) "Entrepreneurship In And Around Institutional Voids", they

pointed out that a weak formal institution limits the market participation of the poor, which in turn limits the poor's ability to improve their existing condition.

> *"The political, economic and social heritage of the war partly explains the lack of action on behalf of the government and business groups to build institutions that facilitate participation in markets; which in turn opened up opportunities for motivated entrepreneurs to bring about social and institutional change." (Martí & Mair, 2006, p. 7)*

While institutional theory offers the theoretical framework from a macro perspective of the society, entrepreneur literatures investigate the resource and capability of the individual. In combination, they describe the opportunities and challenges in and around society. From this point, the digital divide in Bangladesh can be understood as followed:

Inadequate formal institution has led to over a quarter of Bangladesh's people live in extreme poverty and their most basic needs unmet(Martí & Mair, 2006). From this point it is difficult to argue any benefits of ICT. According to Maslow's pyramid of needs, access to ICT belongs arguable to "self-actualization", a cognitive need that can be achieved when all other needs below are met, such as housing, access to clean water and so on. Furthermore, As Islam and Tsuji (2011) has pointed out Bangladesh suffers from electricity supply issues, which further supports the findings of Martí and Mair (2006) for the underdevelopment of formal institution. The lack of formal institution can lead to BoP households get trapped on a debt-treadmill, while living and working in an environment that lacks state-provisioned safety nets (Ansari et al., 2012). Without any governmental safety in place, the meagre incomes and the non-existent savings of the BoP household, microloans may be used to address family emergencies instead of managing the business (Ansari et al., 2012). More importantly, power supply is a vital part of the fundamental infrastructure that enables the implantation and usage of ICT. In addition, poor power supply also implies the lacks of other utilitarian structures.



Forestier, Grace and Kenny (2002) points out the lack of education in all level of the society in Bangladesh, from governmental employee that are working with ICT industry to the BoP living in rural parts of the country. They have specified the lack of education includes language skill, namely English and the lack of ICT skills. In order to benefit from ICT, some basic skills are required, such as

how to use a computer, search the Internet for information (most of these skills are taken for granted in the developed countries, especially the Millenniums, whom are practically born with a Iphone in hand). Level of education in the population is also highly related to the formal institutions maturity. The paradox here is, social condition for BoP is unlikely to be improve, without the ability to pursue new opportunities, but at the same time, in order to gain the necessary abilities, BoP needs a social context that enables knowledge transfer (Ansari et al., 2012).

> *"Reversing global poverty requires a profound change in prevalent assumptions about growth, development, and progress with regard to the relationship between enterprises, governments, and communities, where poverty is not simply equated to a deficiency of income or lack of access to new products and services."* (Ansari et al., 2012, p. 833)

From the micro perspective, ICT have created business opportunities for those with adequate level of education, namely the younger generation(Forestier, Grace, & Kenny, 2002), while discriminates those with high illiteracy level. As Martí and Mair (2006) have pointed out, the development of a society is too much for one single organization to bear, where the development of emerging economies is a collaborative effort of formal, regulative institutions and informal institutions, such as private businesses, NGO's and the people.
In sum, from a resource and capability point of view, not only the government in Bangladesh lacks the necessary abilities to support further advancement of ICT benefits, and in combination with the current educational level of the society, have diminished the total benefits of ICT.

In the example of ICT for development in Bangladesh, the paradox lies not with any theory or approach as such, but within the complexity of development. The discourse of ICT4D often investigate social phenomenon without taking into account the relation of the investigated object and its environment. There exists no doubt about the positive effect of technological advancement, but by accounting for the historical development of technological innovation, from the invention of ships, train and telegraph and so on(Burke & Briggs, 2009), it is clear that technology is a privilege, reserved for the elite, where the adoption of the technology is driven by factors such as business efficiency and profitability; and the usefulness of the invention is determined by the local context.

In other words, the paradox is not whether ICT can promote development, but the expectations originating from globalization, where equality, or even distribution of wealth (money and information) is a fundamental Western assumption; that "what I have, you also need to have NOW", disregarding the local context, in terms of resource and capability. As for the notion "digital divide", is "just"

another description of resources scarcity in developing country. To phrase it differently, it is maybe misguided to discuss "what ICT have done for the development of Bangladesh", perhaps the questions should be "how can ICT support or contribute to the further development of emerging economies", such as Bangladesh.

Drawing from institutional theory, the development of the society relies on the interconnected relation between all actors within that society; a weak formal institution will affect all level of society that in turn may strengthen the informal institutions and create opportunities for some, while those that are weakest are left with little help. Still, here it is important to remember that as long as the basic needs (food, shelter) are not met, it will be difficult to implement any initiatives that does not address these fundamental challenges for survival.

Concluding discussion

Today, in an increasingly science and data-driven world, where the use of scientific methods has formed the base of what some scholars have termed the "Western" way of understanding reality. Most researchers working within and around development studies are limited by a proud research tradition that deals great with binary, static and logical based challenges, while falls short when it comes to complex situations that require more than one solutions. The Western research tradition have created many excellent, but highly differentiated fields of studies that each have defined and investigated in-depth a specific field of a social phenomenon (CSR, ICT4D, social entrepreneurship, institutional theory, organizational theory, just to name a few). Each of these fields investigate development from a different angle, and each with contradicting results within their own fields.

With the increasing degree of globalization and connectivity, I hope that I am not the only that finds the world is getting more complex by the day. In light of the growing complexity, the West are increasingly looking towards East in hope for a different approach to complexity. In the East, the development ideas are influenced by the teachings of Buddhism, Taoism and Confucianism that focused on harmony in both self-development and for the development of the society. Here the concept of development is embedded in chaos, where complexity is a nature part of it, where all is connected, simultaneously changing, evolving and influencing each other. In other words, from this point of view, in order to see the ICT's influence on the society, one must make sure that the country in question have the ability and resource to operate it. Especially in the context of least developing countries, where they are fighting for access to basic utilities, such as clean water, shelter and food.

In the case of CIC in Bangladesh, have anyone ever investigate whether these centres have provided, other than the operates, any improvement in their life? Or are they the new marginalized people? Torero, Chowdhury and Galdo (2003) are the only researches in the literature review that have notice the geographical composition of Bangladesh. As Bangladesh consist mostly of flat terrain (Torero, Chowdhury, & Galdo, 2003), here it might be ideal to support the growth in the agriculture sector, in order to meet the rising demand of a growing population.

This paper is a preliminary attempt to unify and fill in some of the gaps that exist in ICT4D discourse. Eastern philosophy of Yin-Yang represents a holistic approach to reality, taking into account that development is a dynamic process over time, and depends on the point of departure of each country or region, the developmental enablers and inhibitors will be different. In contrast to popular beliefs, we DO have all to tools needed to understand the complexity that is caused by technological advancement and globalization. But this is not an easy task to perform. Many scholars, such as Avgerou have point out the need for cross-disciplinary studies. In the light of ICT4D, it would be ideally to include institutional theory, social entrepreneurship to investigate the missing supportive systems that enables societal development. It would also be useful to include the study of CSR that works with businesses and NGO's to improve the quality of life for the poorest. Furthermore, it would be insightful to draw on the historical development of the state and innovation studies to understand how technology can enable or disable progress. However, this requires that scholars from above mentioned disciplines to work together to generate a unified research paper that includes all these considerations. However currently this is not the trend, so there is yet a lot room for improvement.

Reference

Alias, N. A. (2013). *ICT Development for Social and Rural Connectedness*. Springer.

Ansari, S., Munir, K., & Gregg, T. (2012). Impact at the "Bottom of the Pyramid": The role of social capital in capability development and community empowerment. *Journal of Management Studies*, *49*(4), 813–842. https://doi.org/10.1111/j.1467-6486.2012.01042.x

Avgerou, C. (2008). Information systems in developing countries: A critical research review. *Journal of Information Technology*, *23*(3), 133–146. https://doi.org/10.1057/palgrave.jit.2000136

Avgerou, C. (2010). Discourses on ICT and Development. *Information Technologies & International Development*, *6*(3), 1–18. Retrieved from http://www.itidjournal.org/index.php/itid/article/view/560

Barzilai-Nahon, K. (2006). Gaps and bits: Conceptualizing measurements for digital divide/s. *The Information Society*,

22(5), 269–278. https://doi.org/10.1080/01972240600903953

Berger, P. L., & Luckmann, T. (1966). *The social construction of reality*. *Penguin Books*. Penguin Group. https://doi.org/10.2307/323448

Blowfield, M., & Dolan, C. S. (2014). Business as a development agent: evidence of possibility and improbability. *Third World Quarterly*, *35*(1), 22–42. https://doi.org/10.1080/01436597.2013.868982

Boyd, D., & Crawford, K. (2012). Critical Questions for Big Data:Provocations for a Cultural, Technological, and Scholarly Phenomenon. *Information, Communication & Society*, *15*(5), 662–679. https://doi.org/10.1126/science.1243089

Burke, P., & Briggs, A. (2009). *A Social History of the Media: From Gutenberg to the Internet*. Polity Press.

Chae, B., & Bloodgood, J. M. (2006). The paradoxes of knowledge management: An eastern philosophical perspective. *Information and Organization*, *16*(1), 1–26. https://doi.org/10.1016/j.infoandorg.2005.06.003

Dobrota, M., Jeremic, V., & Markovic, A. (2012). A new perspective on the ICT Development Index. *Information Development*, *28*(4), 271–280. https://doi.org/10.1177/0266666912446497

Eoyang, E. (1989). Chaos Misread: Or, There's Wonton in My Soup. *Comparative Literature Studies*, *26*(3), 271–284.

Fang, T. (2006). From "Onion" to "Ocean": Paradox and Change in National Cultures. *International Studies of Management and Organization*, *35*(4), 71–90. https://doi.org/10.2307/40397646

Fang, T. (2012). Yin yang: A new perspective on culture. *Management and Organization Review*, *8*(1), 25–50. https://doi.org/10.1111/j.1740-8784.2011.00221.x

Flyverbom, M., & Madsen, A. K. (2015). Sorting Data Out: Unpacking Big Data Value Chains and Algorithmic Knowledge Production. *Die Gesellschaft Der Daten: Über Die Digitale Transformation Der Sozialen Ordnung*, 123–144.

Forestier, E., Grace, J., & Kenny, C. (2002). Can information and communication technologies be pro-poor? *Telecommunications Policy*, *26*(11), 623–646. https://doi.org/10.1016/S0308-5961(02)00061-7

Gore, C. (2000). The rise and fall of the Washington Consensus as a paradigm for developing countries. *World Development*, *28*(5), 789–804. https://doi.org/10.1016/S0305-750X(99)00160-6

Gorica, K., Kordha Tolica, E., & Sevrani, K. (2015). *Information Society Development through ICT Market Strategies - Albania versus Other Developing Countries*. Springer.

Gumbus, A., & Grodzinsky, F. (2016). Era of big data. *ACM SIGCAS Computers and Society*, *45*(3), 118–125. https://doi.org/10.1145/2874239.2874256

Hall, D. L. (1978). Process and anarchy-A Taoist vision of creativity. *Philosophy East and West*, *28*(3), 271–285.

Hart, S. L., & Christensen, C. M. (2002). The Great Leap: Driving Innovation From the Base of the Pyramid. *MIT Sloan Management Review*, *44*(1), 51–56. Retrieved from http://sloanreview.mit.edu/article/the-great-leap-driving-innovation-from-the-base-of-the-pyramid/

Heeks, R. (2002). Information systems and developing countries: failure, success, and local improvisations. *Information Society*, *18*(2), 101–112. https://doi.org/10.1080/01972240290075039

Heffernan, C., Lin, Y. B., & Thomson, K. (2016). DRAWING FROM DEVELOPMENT: TOWARDS UNIFYING THEORY AND PRACTICE OF ICT4D. *Journal of International Development J.*, *28*, 902–918. https://doi.org/10.1002/jid

Ives, B., & Learmonth, G. P. (1984). The information system as a competitive weapon. *Communications of the ACM*, *27*(12), 1193–1201.

Jung, C. G. (2014). *Aion: Researches Into the Phenomenology of the Self* (2. ed.). London and New York: Routledge.

Khanna, T., & Palepu, K. (1997). Why focused strategies may be wrong for emerging markets. *Harvard Business Review*, *75*(4), 41–51. https://doi.org/10.1002/tie.20059

Khavul, S., & Bruton, G. D. (2013). Harnessing Innovation for Change: Sustainability and Poverty in Developing Countries. *Journal of Management Studies*, *50*(2), 285–306. https://doi.org/10.1111/j.1467-6486.2012.01067.x

Kiely, R. A. Y. (1999). The Last Refuge of the Nohle Savage ? A Critical Assessment of Post-Development Theory. *The European Journal of Development Research*, *11*(1), 30–55.

Kitchin, R. (2014). Big Data, new epistemologies and paradigm shifts. *Big Data & Society*, *1*(1), 205395171452848. https://doi.org/10.1177/2053951714528481

Kshetri, N. (2010). Cloud Computing in Developing Economies: Drivers, Effects and Policy Measures. *Pacific Telecommunications Council PTC'10 Proceedings*, (Idc), 1–17. Retrieved from https://www.ptc.org

Kshetri, N. (2016). Institutional and economic factors affecting the development of the Chinese cloud computing industry and market. *Telecommunications Policy*, *40*(2–3), 116–129. https://doi.org/10.1016/j.telpol.2015.07.006

Kuada, J. (2009). Gender, Social Networks, and Entrepreneurship in Ghana. *Journal of African Business*, *10*(1), 85–103 (18 pages). https://doi.org/10.1080/15228910802701445

Lacity, M. C., & Reynolds, P. (2014). Cloud Services Practices for Small and Medium-Sized Enterprises. *MIS Quarterly Executive*, *13*(1), 31–44.

Li, P. P. (2012). Toward an integrative framework of indigenous research: The geocentric implications of Yin-Yang Balance. *Asia Pacific Journal of Management*, *29*(4), 849–872. https://doi.org/10.1007/s10490-011-9250-z

Li, P. P. (2016). Global implications of the indigenous epistemological system from the east. *Cross Cultural & Strategic Management*, *23*(1), 42–77. https://doi.org/10.1108/CCSM-10-2015-0137

Li, X. (2014). Can Yin-Yang Guide Chinese Indigenous Management Research? *Management and Organization Review*, *10*(1), 7–27. https://doi.org/10.1111/more.12042

Li, X., Worm, V., & Xie, P. (2015). *Solutions to Organizational Paradox: A Philosophical Perspective*.

Locke, K., Golden-Biddle, K., & Feldman, M. S. (2008). Perspective—Making Doubt Generative: Rethinking the Role of Doubt in the Research Process. *Organization Science*, *19*(6), 907–918. https://doi.org/10.1287/orsc.1080.0398

Marszk, A., & Lechman, E. (2017). Information and Communication Technologies for Economic Development - Identifying the Channels of Impact. In H. Kaur, A. Marszk, & E. Lechman (Eds.), *Catalyzing Development through ICT Adoption* (pp. 3–14). Springer.

Martí, I., & Mair, J. (2006). *Entrepreneurship In And Around Institutional Voids : A CASE STUDY FROM BANGLADESH* (Vol. 3).

Mayer-Schönberger, V., & Cukier, K. (2013). Big Data: a revolution that will transform how we live, work, and think.

Moodley, S. (2005). The Promise of E-Development ? A Critical Assessment of the State ICT for Poverty Reduction Discourse in South Africa. *Perspectives on Global Development and Technology*, *4*(1), 1–27.

Nisbett, R. E., & Peng, K. (1999). Culture, Dialectics, and Reasoning About Contradiction. *American Psychologist*, (54), 741–754.

Niu, W., & Sternberg, R. J. (2006). The philosophical roots of Western and Eastern conceptions of creativity. *Journal of Theoretical and Philosophical Psychology*, *26*(August 2015), 18–38. https://doi.org/10.1037/h0091265

North, D. (1993). The New Institutional Economics and Development. *EconWPA Economic History*, (January), 3–6. Retrieved from http://www.deu.edu.tr/userweb/sedef.akgungor/Current topics in Turkish Economy/north.pdf

Paletz, S. B., Bogue, K., Miron-Spektor, E., & Spencer-Rodgers, J. (2015). Dialectical Thinking and Creativity from Many Perspectives: Contradiction and Tension. In J. Spencer-Rodgers & K. Peng (Eds.), *Psychological and cultural foundations of dialectical thinking*. Oxford University Press.

Portes, A. (1998). Social capital: its origins and applications in modern sociology. *Annual Review of Sociology*, *24*, 1–24.

Portes, A., & Landolt, P. (1996). The downside of social capital. *The American Prospect*, *26*, 18–21.

Puffer, S. M., McCarthy, D. J., & Boisot, M. (2010). Entrepreneurship in Russia and China: The impact of formal institutional voids. *Entrepreneurship: Theory and Practice*, *34*(3), 441–467. https://doi.org/10.1111/j.1540-6520.2009.00353.x

Putnam, R. D. (2000). Bowling Alone: America's Declining Social Capital. In L. Crothers & C. Lockhart (Eds.), *Culture and Politics: A Reader* (pp. 223–234). New York: Palgrave Macmillan US. https://doi.org/10.1007/978-1-349-62397-6_12

Qureshi, S., & Kamal, M. (2011). Role of Cloud Computing Interventions for Micro-Enterprise Growth : Implications for Global Development Keywords. *Fourth Annual Workshop of the AIS Special Interest Group for ICT in Global Development*, *2*, 4–16.

Rahman, S. A., Taghizadeh, S. K., Ramayah, T., & Alam, M. M. D. (2017). Technology acceptance among micro-entrepreneurs in marginalized social strata: The case of social innovation in Bangladesh. *Technological Forecasting and Social Change*, *118*, 236–245. https://doi.org/10.1016/j.techfore.2017.01.027

Rai, S., Harindranath, G., & Liebenau, J. (2013). Special issue on IT innovation in emerging economies. *Journal of Information Technology*, *28*(4), 261–263. https://doi.org/10.1057/jit.2013.24

Rashid, A. T. (2017). Inclusive Capitalism and Development : Case Studies of Telecenters Fostering Inclusion Through ICTs in Bangladesh. *Information Technologies & International Development*, *13*, 1–14.

Rashid, A. T., & Rahman, M. (2009). Making profit to solve development problems: the case of Telenor AS and the Village Phone Programme in Bangladesh. *Journal of Marketing Management*, *25*(9), 1049–1060. https://doi.org/10.1362/026725709X479363

Rodrigues, S. B. (2013). *Understanding the Environments of Emerging Markets: The Social Costs of Institutional Voids*. *Erasmus Research Institute of Management - ERIM*. Erasmus Research Institute of Management - ERIM.

Roldan, M. D. G. Z., & Due, B. (2012). Bangladesh and the role of private sector addressing digital divides. *Asia-Pacific Social Science Review*, *12*(1), 83–90.

Ross, P. K., & Blumenstein, M. (2015). Cloud computing as a facilitator of SME entrepreneurship. *Technology Analysis & Strategic Management*, *27*(1), 87–101. https://doi.org/10.1080/09537325.2014.951621

Sardar, Z. (1994). Conquests, chaos and complexity. The Other in modern and postmodern science. *Futures*, *26*(6), 665–682. https://doi.org/10.1016/0016-3287(94)90036-1

Saunders, M., Lewis, P., & Thornhill, A. (2008). *Research Methods for Business Students*. *Research methods for business students*. Pearson Education Limited, Prentice Hall. https://doi.org/10.1007/s13398-014-0173-7.2

Schad, J., Lewis, M. W., Raisch, S., & Smith, W. K. (2016). Paradox Research in Management Science: Looking Back

to Move Forward. *Academy of Management Annals*, *10*(1), 5–64. https://doi.org/September 18, 2015

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, *5*(9), 9–16. https://doi.org/10.5539/elt.v5n9p9

Sen, A. (1999). The Possibility of Sociai Choice. *The American Economic Review*, 349–366.

Shen, V. (1995). Confucianism, Taoism and Constructive realism. In V. Shen & V. D. Tran (Eds.), *Philosophy of Science and Education: Chinese and European Views* (pp. 107–122).

Spies, M. (1999). *Rhetoric, Rhetoricians, and Poets: Studies in Renaissance Poetry and Poetic*. (H. Duits & V. Strien, Eds.). Amsterdam University Press.

Sumner, A. (2012). Where Do The Poor Live? *World Development*, *40*(5), 865–877. https://doi.org/10.1016/j.worlddev.2011.09.007

Torero, M., Chowdhury, S. K., & Galdo, V. (2003). Willingness to pay for the rural telephone service in Bangladesh and Peru. *Information Economics and Policy*, *15*(3), 327–361. https://doi.org/10.1016/S0167-6245(03)00002-7

Turner, S., & Nguyen, P. (2005). Young entrepreneurs, social capital and doi moi in Hanoi, Vietnam. *Urban Studies*, *42*(10), 1693–1710 (17 pages). https://doi.org/10.1080/00420980500231563

Walsham, G. (1995). Interpretive case studies in IS research: nature and method. *European Journal of Information Systems*, *4*(2), 74–81. https://doi.org/10.1057/ejis.1995.9

Wilson, M. (2002). Understanding the International ICT and Development Discourse : Assumptions and implications. *The African Journal of Information and Communication*, *3*, 80–93.

Winch, P. (2003). *The Idea of a Social Science and Its Relation to Philosophy*. (2. ed). Taylor & Francis e-Library. https://doi.org/10.2307/2092093

Appendix 1

In the context of developing countries, institution theory and study of entrepreneurship can be important contributors to the holistic understanding of strength and weakness of a society in transition. Throughout history, institutions have been devised by human beings to create order and reduce uncertainty. Institutions are according to North; "the humanly devised constraints that structure political, economic and social interactions" (North, 1993). They consist of both informal constraints (values, norms, sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, economic rules, property rights, and contracts). Based on North's work, Scott (2005) introduced his well-known formulation of three categories of institutional forces, the regulative, the normative and the cognitive. First, the regulatory dimension of the institutional profile consists of laws, regulations, rules, and government policies that forms governmental legislation and industrial agreements and standards, these in turn, define the business and market condition. Second, the normative dimen-

sion consists of social norms, values, beliefs, and assumptions about human nature and human behavior that are, socially shared and carried by individuals. It is also often called "culture". Normative systems define goals or objectives (e.g. winning the game or making a profit) but also designate the appropriate ways to pursue them (e.g. conceptions of fair business practices). Lastly, the cognitive dimension reflects the cognitive structures and social knowledge shared by the people in a given country or region, in terms of culture and language, and other taken-for-granted behavior that people rarely think about. The cognitive elements of institutions are the rules that constitute the nature of reality and the frames through which meaning is made (selecting and interpreting information).

Various formal and informal institutions enable and constrain exchange within and across spheres of value circulation(Puffer, McCarthy, & Boisot, 2010). When formal institutions supporting market activity are weak, they can be considered as 'institutional voids' (Martí & Mair, 2006). The notion of 'institutional voids' does not denote an absence of institutions, but an absence of formal institutions that enable market participation and activity(Martí & Mair, 2006). Informal social or cultural institutions may fill such voids and potentially hamper market activity by sanctioning norm-deviating behavior and are thus something that some actors may change(Martí & Mair, 2006). For example, institutional voids can hamper bringing buyers and sellers together through the lack of legal frameworks, contract- enforcing mechanisms, payment systems(Khanna & Palepu, 1997). Institutional voids can often give way to the creation of informal or even illegal institutions as a response to the lack of formal mechanisms required by the market. For example, the lack of formal lending institutions could lead to the creation of informal lending systems that engage in unfair practices(Kuada, 2009).

Emerging economies are shown to be characterized by more voids in comparison to those in developed economies with better established formal institutional structures. Rodrigues (2013), suggests that "voids become salient particularly when economic growth advances faster than social and institutional structures, as it is difficult for the latter to anticipate or follow market dynamics"(Rodrigues, 2013, p. 14). Further, it is argued that the uncertainty risk faced by entrepreneurs in emerging or transition economies are greater than those in more developed economies due to these voids. It is also proposed that in some instances entrepreneurs can actually capitalizes of these voids by bringing in mechanisms to address these voids(Khanna & Palepu, 1997; Puffer et al., 2010). Furthermore, according to North, the process of entrepreneurship can be explained through institutional theory, where the condition for entrepreneurship can be found within the formal and informal institutions. North argues that the agent of change is the individual entrepreneur responding to the incentives embodied in the institutional framework (North, 1993).

Social capital in emerging market context:

Entrepreneurs require information, capital, skills, and labor to start business activities. However, in developing countries, where the supportive systems for entrepreneurship is missing or inadequate, entrepreneurs must utilize social capital or informal networks in order to start and maintain business activities. In many of these countries, family remains a vital source for resource. In their study of young Vietnamese entrepreneurs, Turner and Nguyen (2005) discovered that bonding was the most utilized mode for social capital. According to Turner and Nguyen (2005), these Vietnamese entrepreneurs are affected by a culture that is influenced by agrarian and Confucian traditions, where the trust is limited to a narrow circle of family and friends, and a marketplace, where the formal supportive institutions is in transition (Turner & Nguyen, 2005). These entrepreneurs have limited access to economic capital from formal channels (e.g. loan from banks). In their study, Turner and Nguyen points out that most of the entrepreneurs will borrow money from family and friends and consider formal capital as nothing but a dream. In another study of Ghanaian entrepreneurs, similar findings were discovered (Kuada, 2009). In his finding, Ghanaian entrepreneur, much like in Vietnam, faces challenges from weak formal institutions, where they use social capital and network to leverage the formal institutional voids, in order to gains access to finance, distribution network, labor and information. More so, the study points out that the new entrepreneurs also rely on social capital for moral and psychological support(Kuada, 2009). Their findings are further supported by Puffer, McCarthy, and Boisot (2010) in their study of entrepreneurship in Russia and China.

In addition, in "Bowling Alone", Putnam (2000) uses the bridging/bonding typology to describe the synergy of the social network, though not in any strictly systematic way. He defines "bridging" social capital as open networks that are outward looking and incorporate people across diverse social cleavages"(Putnam, 2000), while "bonding" social capital consists of "inward looking networks that tend to reinforce exclusive identities and homogeneous groups" (Putnam, 2000). The latter implies family and friend, but also, in extreme cases, "superglued" networks based on aggressive exclusion and may be harmful to society, in general ((Turner & Nguyen 2005; Kuada 2009). The idea of "openness versus exclusivity" links to the distinction raised by Portes and Landolt (1996) between positive and negative social capital. Positive social capital derived from social control is typically found in the form of what (Portes, 1998, p. 10) calls "rule enforcement", "bounded solidarity" and "enforceable trust", which generates positive outcomes fairly equally for all members of a group. Negative social

capital also involves enforceable rules, but generates negative outcomes for the group, or positive outcomes for some members at the expense of others(Portes & Landolt, 1996).

From an institutional perspective, entrepreneurs in developing countries utilize social capital to fill in the formal institutional voids. However, social capital has its limits. According to Turner and Nguyen (2005) as the enterprise grows, there will be a point, where financial capital from family and friend will be insufficient to support business operations. With limited access to informal finance and Vietnam's formal financial system is either mistrusted or too complicated to use, Vietnam's young entrepreneurs are facing challenges in scaling-up. Although some scholars have argued for social capital as a resource with positive outcomes, others increasingly point out the negative outcomes of social capital - unbalanced investment or overinvestment in social capital can transform a potentially productive asset into a constraint and a liability (Turner & Nguyen 2005). Kuada (2005) further points out that some African entrepreneurs, by obligation, hiring family members even there is no job or underqualified that in turn limits the enterprise's growth and viability. More so, other studies have suggested, social capital in form of interpersonal obligations can be alleviated through compensations, which can lead to favouritism or corruption.