

Examining Reverse Innovation and Collaboration: A Case Study in the Context of Uganda

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Abstract

The objective of this research is to establish the increasing importance of reverse innovation and explore the possibility for carrying out reverse innovation collaboratively. A thorough examination of the phenomenon will allow for identification of the essential elements required in the process of reverse innovation. These elements will be utilized to assess a collaborative innovation initiative and explore its potential to engage in reverse innovation. Specifically, the goal of the research is to establish if, how, and why reverse innovation can be carried out collaboratively in the context of Uganda.

As existing literature did not provide a substantial framework for the process of reverse innovation, elements of key literature on reverse innovation were first adopted into a framework to model the reverse innovation process. This framework was utilized to examine the case study of the research, which introduced a collaborative innovation initiative, involving UNICEF, academia, and private sector from an advanced country. The case study presented research that had been carried out over the course of 2.5 years, through the author's primary involvement in the collaboration.

Findings from the empirical research led to an adaptation of the theoretical framework, which addressed how UNICEF, academia, and private sector from an advanced country could collaborate in a process of reverse innovation. Furthermore, two models were provided for establishing a collaborative initiative in the context of this case as well as innovating in the context of Uganda. Therefore, findings of this study introduced new additions to existing literature.

The findings indicated that collaboration is beneficial in the context of developing countries and it is in fact possible for reverse innovations to be carried out collaboratively, under certain circumstances. Private sector must be involved in the collaboration and one of the partners should be based full-time in the developing country. As it is expected that the innovation will be carried out concurrently in both an advanced and developing country, it will be necessary that a bulk of each phase of the reverse innovation process is spent predominantly in one of the markets. Ultimately, the flow of innovation can reverse between developing and advanced countries as long as it is eventually introduced into an advanced country.

Keywords Reverse innovation, frugal innovation, collaboration, developing country, Uganda, UNICEF

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1.0 INTRODUCTION

1.1. Background of Study

We are in a time of financial instability and stagnated economic growth in the West while emerging economies are flourishing in the East and South. As leaders of Western multinational corporations are becoming increasingly aware that developing countries are rapidly growing and millions of people are rising up into the middle class, there are growing pressures for any business to open up to new, developing countries and continue to compete and produce profits. Developing markets are thus becoming an increasingly growing area of focus, especially for multinational corporations, as these markets are opening up new opportunities for business as well as new opportunities for innovation.

Figures from the International Monetary Fund assert that 85% of global citizens, about 5.8 billion people, live in developing countries and produce a total GDP of nearly \$35 trillion. This amounts to almost half of the world's GDP. Going into the future, developing nations are expected to represent at least two-thirds of the world GDP growth. (Govindarajan and Trimble, 2012) With such a vast amount of influence, developing markets should not only be viewed as Brazil, Russia, India and China – or the 'BRIC' countries – but instead it is essential for companies to look also beyond these countries in order to fully understand emerging markets and frugally innovating in these markets. (Petrick and Juntiwassarakij, 2011)

In years to come, a huge challenge for any business is to consider that developed countries are limited to a handful of affluent people, but in the developing countries, there is an exceedingly high population of people who can only spend frugally. Although very different, in both cases the amount of money spent is huge. Both consumer markets however present an entirely different range of wants and needs. (Govindarajan and Trimble, 2012) The current structure of Western business models is not conducive to producing innovations that meet the criteria of consumers in developing countries who

are demanding low-cost solutions with high value. (Frugal Solutions, A Manual) Hence, it is not realistic for Western MNCs to expect their rich-world offerings to fulfill the dramatically different needs of the booming middle class in developing countries. The West needs to establish a new mindset towards innovation, one that is driven by inexpensive and higher quality innovation while incorporating a more frugal, participative approach. (Govindarajan and Trimble 2012, Radjou et al. 2012)

One way to do this is through practicing reverse innovation. The phenomenon of reverse innovation has been an increasingly expanding area of focus over recent years due to growing comprehension of its significance, especially regarding innovating in developing countries. Indra K. Nooyi, chairman and CEO of PepsiCo states, “Multinationals now understand that a truly global strategy must include smart pathways to strong positions in emerging economics. For there is where the richest future growth is to be found. Reverse innovation...is certainly one of the keys to making the most of emerging-market opportunities.” (Govindarajan and Trimble (2012) p. IX)

What is ultimately needed, and what reverse innovation can provide, is both a new approach for businesses to innovate in emerging markets and an approach that benefits the poor. Sustainable, win-win scenarios should be the goal, where companies will engage local stakeholders in the innovation process and produce outputs that prove valuable to the firm and the emerging market consumer. In order to do so, firms should not only engage with the consumers but also with civil society organizations, government, and other relevant institutes to establish an entirely new, successful approach to the building new markets in developing countries. Not only will this support the eradication of poverty but also prove to be financially viable to firms worldwide, going into the future. (Prahalad, 2010)

1.2. Research Problem

In the realm of innovation in developing countries, reverse innovation has become an expanding area of focus in recent years. As it is still in early stages of development, there

have been several interpretations of the phenomenon recently published, in attempts to define the fundamentals of reverse innovation and understand its significance.

According to Aschmoneit and Janevska (2013), the first example of the practice of reverse innovation dates “back to 2002 (GE’s ECG machine), while the first scientific article was published in 2009 (Immelt, Govindarajan and Trimble, 2009).” (p. 5) After the first publication in 2009, the young phenomenon has been picking up speed in extant literature. However, this literature has focused on the strategic importance of reverse innovation for MNCs, but has not appeared to explore the process of reverse innovation in contexts outside of purely MNC involvement.

As modern information and communications technology allows for truly international and multilateral collaboration to occur, innovation initiatives are increasingly being carried out concurrently worldwide. Von Zedtwitz et al. (2014) and Corsi (2012) explain the need for further research to be conducted on collaborative initiatives in developing countries. Von Zedtwitz et al. (2014) specifically state, “more research on innovation conducted concurrently in different countries is necessary...[as] there are always a few cases of innovation that are truly multinational in nature.” (p. 13) Therefore, this thesis challenges existing literature to explore the possibility to carry out reverse innovation collaboratively.

1.3. Research Objective

The purpose of this thesis is to establish and argue the increasing importance of the young phenomenon of reverse innovation and examine whether reverse innovation can be carried out collaboratively. A thorough examination of the phenomenon will allow for identification of the essential elements required in the process of reverse innovation. These elements will be utilized to assess a collaborative innovation initiative in the context of the developing country Uganda and explore its potential to engage in reverse innovation. Specifically, the goal of the research is to establish if, how, and why reverse innovation can be carried out collaboratively.

The study will particularly explore how might UNICEF (or a similar international development organization), academia, and advanced country private sector collaborate to engage in a process of reverse innovation. As Uganda will be the developing market of focus in the study, to compliment the proposed collaborative reverse innovation process it will be further discussed what should be taken into consideration when establishing a partnership amongst the above-mentioned players and how to plan for an innovation initiative in the context of Uganda.

The structure of this study will focus on innovation and collaboration in emerging markets as well as existing views of reverse innovation, while introducing several theoretical elements involved. As reverse innovation is such a young phenomenon, the predominant theory utilized for the research is largely based on the publications of Govindarajan and Trimble (2012), Corsi (2012), Zeschky et al. (2014a), Zeschky et al. (2014b), and von Zedtwitz et al. (2014). Within the context of the developing country of Uganda, a case study will further examine an ongoing collaborative, innovation initiative between UNICEF, Aalto University, Makerere University, and later Biolan, a private sector partner. The initial literature review provides the theoretical groundwork for an in-depth analysis of the potential for the ongoing, collaborative initiative to engage in a process of reverse innovation. The case analysis of the collaborative initiative emits a proposed model for collaboration in reverse innovation as well as models for setting up a collaboration and carrying out innovation in Uganda. This will provide a general means of understanding a possible avenue for businesses, international development organizations, and academia to exploit when determining how to collaboratively engage in reverse innovation in Uganda. The thesis is ultimately concluded with a summary of the key findings, managerial implications of this study, and suggestions for future research.

1.4. Research Questions

1. What key theories and principles underlie the process of reverse innovation?
2. Can a frugal innovation initiative carried out collaboratively evolve into a process of reverse innovation?
3. A. How and why might UNICEF (or a related IDO), academia, and advanced country private sector carry out reverse innovation collaboratively?
3. B. What should be taken into consideration when setting up a collaboration and innovation initiative for the context of Uganda?

1.5. Definitions

Within this thesis, the following definitions will be implied for the following terms:

Collaboration – “Collaboration implies sharing risks, resources, responsibilities and rewards among organizations acting as a joint entity, in order to achieve a common goal that would not be possible, or would have higher cost, if attempted individually.” (Romero et al. 2009, p. 4693)

Cost Innovation – “Solutions that offer similar functionalities to Western products at lower costs for resource constrained customers... [They] are low-cost alternatives to Western products, with cost reductions realized through process innovations and cost advantages in emerging markets.” (Zeschky et al. 2014b, p. 21-24)

Disruptive Innovation – “At its core, a disruptive innovation is something that creates a new market or transforms an existing one through simplicity, convenience, accessibility, or affordability.” (Anthony 2012, p. 149)

Frugal Innovation – “Innovations specifically developed for resource-constrained customers in emerging markets...[They] build on good-enough innovations but feature

new applications developed specifically for resource-constrained environments, generating an entirely new value proposition.” (Zeschky et al. 2014b, p. 23-24)

Good-enough Innovation – “Solutions that include functionalities and features designed to meet a range of resource-constraints beyond capital constraints...[They] are also cost innovations, but in addition, the products are tailored to the resource-constrained market, with non-value-adding functions eliminated and specific functions designed to meet the specific requirements of resource-constrained customers.” (Zeschky et al. 2014b, p. 22-24)

Innovation - “The generation, acceptance, and implementation of new ideas, processes, products, or services.” (Sinha 2013, p. 70)

Innovation Flow – A flow in which “the principle locus of the innovation shifts during the innovation process while the core idea of the innovation remains essentially unchanged.” (von Zedtwitz et al. 2014, p. 6)

Jugaad Innovation - “A unique way of thinking and acting in response to challenges; it is the gutsy art of spotting opportunities in the most adverse circumstances and resourcefully improvising solutions using simple means.” (Radjou et al. 2012, p. 4)

Reverse Innovation - “Any innovation that is adopted first in the developing world. Surprisingly often, these innovations defy gravity and flow uphill [from emerging markets to developed countries].” (Govindarajan and Trimble 2012, p. 4)

BOP Market, or ‘Bottom of the Pyramid’ - “Consists of over four billion people who live on less than \$2/day. They represent multiple cultures, ethnicity, literacy, capabilities, and needs. They can be segmented in multiple ways... [It is] estimated that the market is about \$5 trillion in purchasing power parity.” (Prahalad 2012, p. 6)

The terms ‘Advanced’ countries or markets and ‘Developing’ countries or markets are distinguished in various ways by different authors. Aschmoneit and Janevska (2013) offer a framework by Cavusgil, Knight, and Riesenberger (2008):

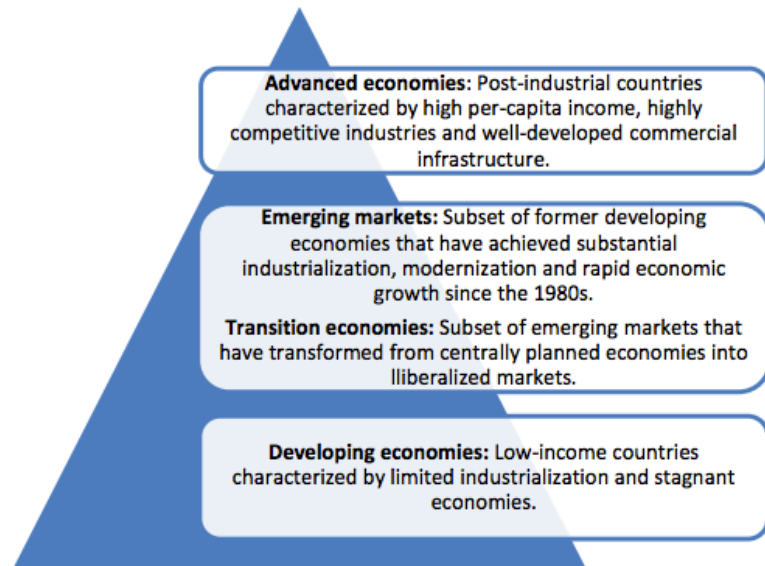


Figure 1: Distinction between advanced economies, developing economies, and emerging markets

Source: Aschmoneit and Janevska 2013, p. 37

This thesis describes the markets in two categories, either advanced market or developing market. Any terms depicted in the study relating to developing markets, i.e. BOP, emerging markets, will be within the classification of developing countries. ‘The West’ or ‘Western MNCs’ depict advanced countries; they do not only apply to countries or companies geographically in the West.

2.0 LITERATURE REVIEW

This section contains a selection of various theories relating to innovation and collaboration in developing countries and reverse innovation. The purpose of this section is to develop an understanding, through theoretical elements, of the growing trend and importance of both innovating and collaborating in developing countries and the process and key elements behind the young phenomenon of reverse innovation. The main emphasis will be put on reverse innovation as a phenomenon and what is needed in order to carry out reverse innovation successfully.

This review will further provide a theoretical basis of understanding for the subsequent empirical study conducted in order to discover if and how innovation conducted concurrently in different countries can lead to reverse innovation.

2.1. Innovation in Developing Countries

Innovation has traditionally been carried out by Western MNCs in developed countries and then much later solutions are adapted and introduced into developing countries. (Madhavan 2012; Petrick and Juntiwassarakij 2011) This process is coined by some as ‘glocalization’ (Madhavan 2012; Govindarajan and Trimble 2012) and involves modifying a developed country offering to suit the particular needs of developing market consumers.

Although glocalization maintains its significance, in recent years developing countries have become a hotbed for innovation and there has been a new flow of innovation coming from developing markets, subsequently being brought into developed nations. (Sinha 2013) This reversal of the typical flow of innovation from developed to developing country is driving Western companies to question whether their current innovation practices will be viable going into the future. Not only are developing countries now upholding fertile grounds for innovation, but they are also displaying a

great growth in consumption as members from their lower class are emerging as new consumers, with increasing purchasing power. (Petrick and Juntiwasarakij 2011, p. 27) This is causing Western MNCs to see the value of innovating in developing countries and they are discovering new gaps in these markets, which are not always visible in developed markets. (Madhavan 2012, pp. 122-123)

The belief is shared that environments which possess abundant needs and constraints yield great opportunities for innovation. (Anthony 2012; Petrick and Juntiwasarakij 2011) Developing countries are environments that are certainly known for their great range of needs and constraints, even if the needs might be rather basic. These particular needs are giving rise to numerous unique ideas ranging from healthcare to transportation, which are transforming into revolutionary innovations and causing disruption amongst existing solutions provided by Western MNCs. (Petrick and Juntiwasarakij 2011, p. 24) Some of the fields in which emerging markets are specializing with innovation include: “low-cost health-care devices, carbon sequestration, solar and wind power, bio-fuels, distributed power generation, batteries, water desalination, microfinance, electric cars, and even ultra-low-cost homes.” (Immelt et al. 2009, p. 59)

Jiatao and Rajiv (2009), Gerybadze and Reger (1999), and Kumar (1998) as cited in Brem and Ivens (2013) share the perspective that now there is a trend of companies from emerging economies introducing their own competences in innovation instead of accepting the place as second-tier innovators as they have typically been known as. (p. 33) This upsurge of companies from developing countries is occurring as these developing market firms are increasingly taking advantage of the opportunities in these markets. These businesses know how to deliver a fair amount of quality and performance at an ultra-low cost, which high-end producers are not yet able to achieve. Therefore, some of these businesses are growing to become top innovators in our global economy and are consequently becoming a threat to Western MNCs. (Sara and Jackson 2010; Govindarajan and Trimble 2012; Brem and Ivens 2013) Govindarajan and Trimble (2012) refer to these innovative companies emerging out of developing countries as ‘emerging giants’. (p. 7)

Business in general in developing markets involves creating more with less (Petrick and Juntiwasarakij 2011). This approach allows for addressing the needs of resource-constrained people and develops innovative products which have been coined as “ ‘good-enough products’ (Christensen, 1997), ‘cost innovation’ products (Williamson, 2010)... ‘frugal innovation’ products (Zeschky et al., 2011)” (Zeschky et al. 2014a, p. 256) as well as ‘resource-constraint’ innovations (Zeschky et al. 2014b, p. 20), ‘inclusive innovations’ (Foster and Heeks 2013, p. 1), in India as either ‘jugaad’ innovations or ‘Gandhian’ innovations (von Zedtwitz et al. 2014, p. 2), in Brazil as ‘gambiarra’, in China as ‘zizhu chuangxin’, or in Kenya as ‘jua kali’. (Radjou et al. 2012, p. 4) The term particularly focused on in this thesis is frugal innovation.

2.1.1. Frugal Innovation

Gupta (2011) as cited in Brem and Ivens (2013), offers that frugal innovation is a new philosophy, with a bottom-up approach in the bottom of the pyramid markets. This entails first identifying the needs of the market and then working backwards to establish a unique solution. (p. 36) Radjou and Prabhu (2013) define frugal innovation as “the ability to generate considerably more business and social value while significantly reducing the use of scarce resources.” (p. 1) Zeschky et al. (2014b) maintain that frugally innovating best reveals the product development capabilities that developing nations have in innovation. (p. 25) Bound and Thornton (2012) as cited in Aschmoneit and Janevska (2013) assert that frugal innovation should not only be thought of as creating a low-cost solution. Rather, it should be recognized as establishing affordable products and services that are built from scratch to offer entirely new value. (p. 42)

2.2. Collaboration in Developing Countries

Prahalad (2010) believes that a new ecosystem should be put in place for markets at the Bottom of the Pyramid. This network would encompass large firms, SMEs, micro entrepreneurs, civil society organizations, as well as public sector collaborating in order

to construct viable businesses. He explains that these networks can provide each stakeholder with such a rich range of knowledge and skills that and could not be as easily accessed if working alone. Whether attaching oneself to an existing system, or building a new ecosystem from scratch, it proves very valuable in the long run. (p. 13)

Van Dijk and Sandee (2002) suggest that instead of firms taking part in the accepted approach of globalization or glocalization, they should engage in a frugal innovation-type initiative that involves developing knowledge of the context and adapting offerings accordingly, with support from the model of development co-operation. They continue by sharing that MNCs could play a great role in partnerships by supporting international production and distribution. Private firms in general would be a key player, as well as universities and local development organizations. (p. 136)

Contrary to views in traditional research that concentrate on business models for single firms that seek to generate economic value – which is evident in literature pertaining to reverse innovation – Dahan et al. (2010) address business modeling in cross-sector collaborations. They argue that new business models should be formed where businesses, NGOs, and other partners join forces to collaboratively develop entirely new solutions. These new business models have the potential to generate new value for all stakeholders involved, especially economic or social value. (p. 328)

Prahalad (2010) explains the importance of managers learning to work with other institutions and engage consumers and society in a new way, ultimately constructing a new co-creation platform. For example, “British petroleum is developing a biomass stove for the rural poor with input from consumers, nongovernmental organizations, and the Indian Institute of Science.” (p. 14) He continues by addressing the fact that not only might co-creation initiatives in the Bottom of the Pyramid reduce the need for investment as well as the risk for each stakeholder, but also through developing the ability to collaborate and join the competencies of each partner, it proves to be very valuable. (p. 15)

2.3. Reverse Innovation

As we now know, for many years companies have been engaged with glocalization of their products and services. Hence, glocalization practices are already basic knowledge in multinationals. Govindarajan and Trimble (2012) point out that just because a solution is successful in an advanced market, does not promise widespread victory upon its introduction into a developing market. Similarly, just because an advanced market offering is de-featured to be offered at a lower price point in developing markets, it does not guarantee success. This is due to the fact that developing market consumers display many different types of needs as compared to advanced market consumers. As a result, a phenomenon known as reverse innovation is quickly increasing in significance. (p. 5) As the approach to reverse innovation is essentially the opposite of glocalization, reverse innovation is an approach that many firms need to now learn from scratch. (Govindarajan and Trimble 2012; Immelt et al. 2009)

Zeschky et al. (2014a) highlight the trend of innovations flowing from developing countries to advanced countries. They share that this new flow of innovation “has been referred to as ‘reverse innovation’ (Immelt et al., 2009) or ‘innovation blowback’ (Brown and Hagel, 2005).” (p. 256) Others have referred to it as trickle-up innovation (Zeschky et al. 2014b, p. 20). Reverse innovation can also be referred to as a ‘disruptive innovation’. (Corsi and Di Minin 2014, p. 76) The term reverse innovation and the theory specifically behind reverse innovation will be focused on in this thesis.

Govindarajan and Trimble (2012) account for the fact that reverse innovations have not been common in the past but are slowly becoming more prevalent. Petrick and Juntiwassarakij (2011) explain that amongst companies such as General Electric (GE), PepsiCo, Procter and Gamble (P&G), Deere & Company, etc., reverse innovation initiatives have been sprouting successfully during the past few years. “Both of GE’s emerging-market focused medical imaging products – the Indian-market electrocardiogram and the China-focused ultrasound machine – are finding markets in rural areas of the West.” (p. 28)

2.3.1. Reverse Innovation Defined

Widely known for popularizing the term, reverse innovation, Govindarajan and Trimble (2012) simply define reverse innovation as “any innovation that is adopted first in the developing world. Surprisingly often, these innovations defy gravity and flow uphill [from developing markets to advanced markets].” (p. 4) Madhavan (2012) considers reverse innovations bring new value propositions to advanced market consumers, once the innovation is developed for an emerging market and then subsequently introduced to an advanced market. (p. 123) The view that Corsi et al. (2011) have on reverse innovation relates to the aforementioned views, and they add on that the reason for this inverted innovation process is due to the rise of markets in developing countries. (p. 13)

Hang (2010) and Corsi and Di Minin (2011) as cited in Sinha (2013) propose that reverse innovations can be defined as disruptive to developed countries. Bower and Christensen (1995) and Christensen (1997) as cited in Corsi (2012) explain that the disruptive innovation paradigm suggests that when a new product or service is introduced into a market and it adds value to a new market of consumers that is typically ignored, it can be considered as disruptive to that market. (p. 27) Therefore, Sinha (2013) further defines reverse innovation as an innovation that can disrupt developing markets by offering entirely new solutions and advanced countries by offering new, valuable solutions to the lower-class consumers. (p. 70)

Although there are authors who interchangeably refer to reverse innovation as frugal innovation, such as Eagar et al. (2011), the views in this thesis follow the beliefs of authors Brem and Ivens (2013) who follow the idea that process of frugal innovation entails exclusively designing new solutions for low-income consumers and reverse innovation as solutions that are first designed in developing countries and then later brought into developed countries, after being adapted to the requirements of Western markets. (p. 36)

Recently, von Zedtwitz et al. (2014) proposed a new definition for reverse innovation as they deemed existing market-oriented definitions to lack the focus of idea generation and development as part of the initial phases of reverse innovation. (p. 2) They propose that

the ‘original idea or concept’ can be created in a developing country and the “development phase of the innovation [where the] core architecture of a product is implemented and key performance-defining features are added” can also be created in a developing country and then subsequently transferred to an advanced market. (p. 5-6) Thus, they define reverse innovation as, “any type of global innovation that...is characterized by a reversal of the flow of innovation from a developing to an advanced country, as long as this innovation is eventually introduced to an advanced country’s market.” (p. 2) They follow by sharing, “it is the classification of the involved countries at the time of the flow that determines whether the innovation is reverse or not.” (p. 12)

Von Zedtwitz et al. (2014) further deem that it is difficult to tell reverse innovation apart from other resource-constrained innovations due to the fact that it lacks a reference framework. They therefore propose a linear, four-phase innovation flow based on the four generic phases of Vernon’s (1979) product life-cycle theory, running sequentially from concept ideation to product development to primary target market introduction to later secondary market introduction.

As von Zedtwitz et al. (2014) adopted their model from Corsi (2012), the following model is the original model presented by Corsi (2012). The only difference in the model presented by von Zedtwitz et al. (2014) is that only the ‘Types of Innovation’ that signify a type of reverse innovation, the boxed-in terms, are shown in the model of von Zedtwitz et al. (2014).

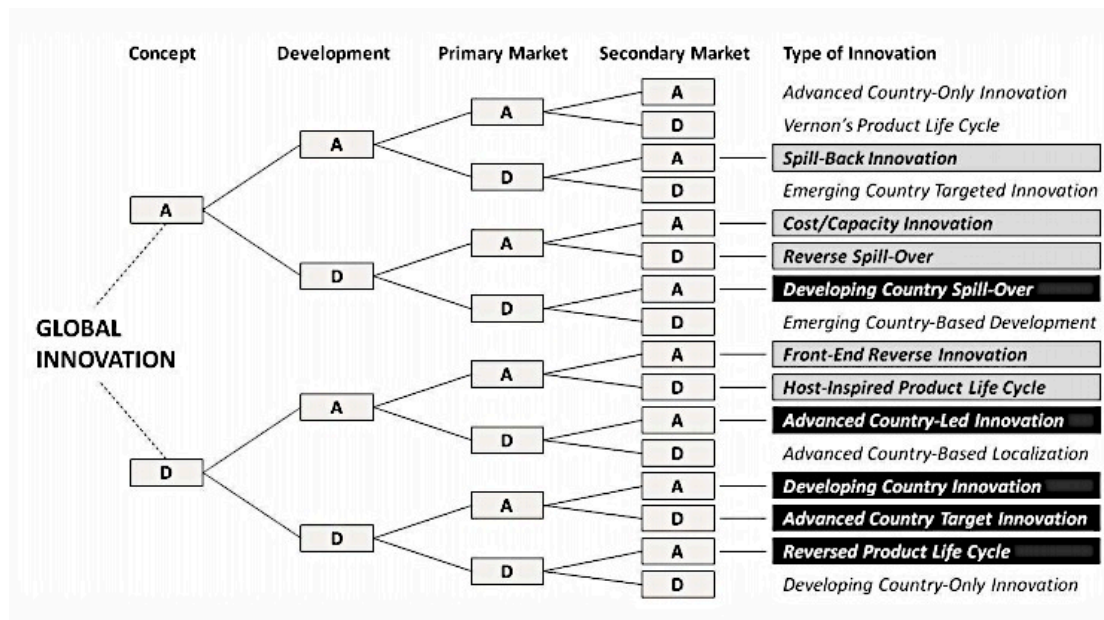


Figure 2: A map of global innovation flows with reverse innovation in the strong and weak sense

Source: Corsi 2012, p. 57

In this model, a set of 16 possible global flows of innovation between developed countries and developing countries is mapped out. 10 out of the 16 global innovation flows are depicted as reverse innovation by being placed in a box. As reverse innovation was initially defined purely based on its introduction to primary and secondary markets, this model adds on to the definition by proposing that there can be additional flows of innovation in reverse innovation from concept ideation to product development before being introduced to the primary and secondary markets. (von Zedtwitz et al. 2014, p. 15)

Using the letter 'A' for developed countries and 'D' for developing countries, von Zedtwitz et al. (2014) seek to clarify which global innovation flows constitute reverse innovation. They further indicate which flows of innovation are strong reverse innovations, indicated with black shading or weak reverse innovations, indicated with grey shading. A strong reverse innovation would signify that at least two of its innovation phases before secondary market introduction take place in a developing country, whereas a weak reverse innovation has only one of its innovation phases take place in a developing country before secondary market introduction. (von Zedtwitz et al. 2014, p. 7)

The authors explain that this model was “developed primarily with product innovation in mind...it also applies to other kinds of innovation, such as technology innovation, business-model innovation, and process or service innovation.” (p. 11) The model does not however provide time-spans for each of the different phases of innovation nor the time between each phase. (p. 12)

Despite the extent of their research, however, von Zedtwitz et al. (2014) suggest that there model may only be applicable to single firms carrying out reverse innovation. Therefore, more research needs to be carried out on similar types of innovation initiatives that are being carried out simultaneously in different countries between multiple stakeholders as these types of multilateral initiatives are becoming more common with the help of modern technology. (p. 13)

2.3.2. Reverse Innovation in Action

Looking at the evolution from glocalization to reverse innovation, Vijay Govindarajan provides this chart in order to differentiate each separate phase, based on the traditional American multinational approach:

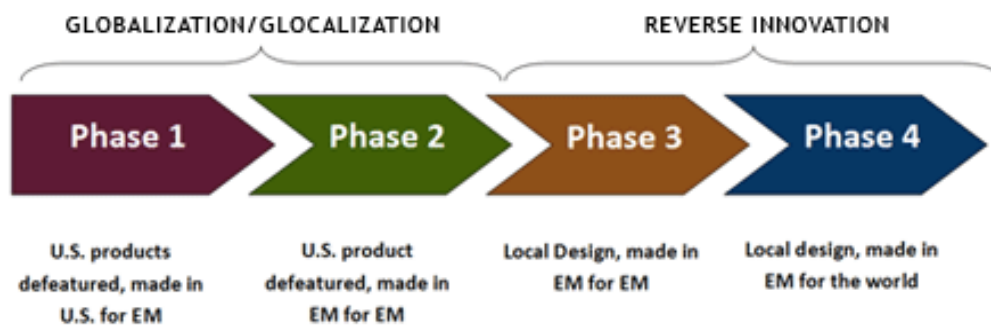


Figure 3: The American multinational approach to emerging markets

Source: (Govindarajan 2009)

In this chart, it is clear to see that first companies have engaged in a process of globalization or creating products in developed countries and take away product features to establish a more affordable offering for emerging markets. In the next phase, glocalization, companies recognized that in order to be more competitive in local markets they needed to meet local needs by adapting their global offerings. The innovations would still come from the developed country but the offerings would be modified specifically for each local market that they are distributed to. The third phase, where the reverse innovation process begins, encompasses a local innovation phase in which the multinational is creating products in the developing country for that specific local market. (Govindarajan 2009) Typically, this phase entails a process of resource-constrained innovation, where businesses are establishing products that offer high value at a low price point directly for the developing market consumers. (Zeschky et al. 2014b, p. 20) The other half of reverse innovation, and the final phase, involves bringing the innovations from developing countries into developed countries. There may not be many innovations that can flow from bottom of the pyramid to top without undergoing alterations so this phase typically requires frugal designs to be modified to appeal to the rich world consumers. (Hart 2014) When these frugal designs are modified and introduced to the market, they may have the potential to cannibalize, or replace, existing products in the advanced market. (Immelt et al. 2009, p. 58) Govindarajan and Trimble (2012) explain that organizations need not be concerned about cannibalization, rather they should prepare for it in order to control it properly. This is due to the fact that reverse innovations have the possibility to replace existing offerings and target new consumer markets and attract new sales by providing entirely new, affordable offerings. (p. 68)

It is important to clearly understand that the increasing praise of reverse innovation does not signify that glocalization practices should be diminished. Glocalization is a process that multinationals are already familiar with as they have been engaging in it for several years and it provides a steady flow of income for them. Therefore, companies should not forego their glocalization practices when welcoming reverse innovation processes, but rather provide strong support to each of the processes separately. (Govindarajan and Trimble 2012, pp. 54-55)

Zeschky et al. (2014b) decipher between what types of innovations may become reverse innovations. They first take all of the distinct types of reverse-constrained innovation and conclude that there are three main types of innovation on which reverse innovation can be established: cost innovation, good-enough innovation, or frugal innovation. This does not signify however that all cost, good-enough, and frugal innovations eventually become reverse innovations. (p. 21)

In a separate publication, Zeschky et al. (2014a) describe the process of reverse innovation based on three determinants shown in Figure 4:

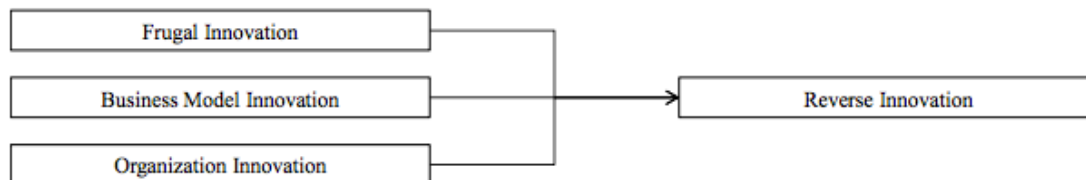


Figure 4: Reference model for reverse innovation

Source: Zeschky et al. 2014a, p. 257

The authors propose this model suggesting that there are three main aspects of reverse innovation: frugal innovation, business model innovation, and organization innovation. They first prove their use of frugal innovation in this model by citing the views of Govindarajan et al. (2012) that reverse innovations begin as resource-constrained solutions. (p. 256) The next point is business model innovation. Teece (2010) offers that in order to produce value, a product or service innovation needs to be complemented by business model innovation. (p. 186) Current business models of Western MNCs are constructed to target average income consumers in developed countries or wealthy consumers in emerging countries. However, as the middle class is growing in developing countries and increasing amounts of resource-constrained people are gaining purchasing power, there is an increasing demand for affordable products. As affordability has a different meaning to average Western consumers compared to the emerging middle-class in developed countries, this is forcing MNCs to rethink their business models. The third

aspect is organization innovation. As reverse innovation requires fundamentally new processes and structures, Western MNCs are now faced with adapting their organizational structures to suit the requirements of reverse innovation. Not only does this entail adapting the physical structure, but also the mindset within the structures. (Zeschky et al. 2014a, p. 257)

In order to establish a reverse innovation mindset within organizations, Govindarajan and Trimble (2012) maintain that CEOs, or others high in the organization, need to shift their focus to developing markets as their innovation hub. These CEOs need to show a clear dedication to supporting the reverse innovation initiative. (p. 43) These personal actions “may require new processes, new partnerships, and even a reinvented value chain.” (p. 38)

2.3.3. Needs Gaps as Opportunities for Reverse Innovation

As Western MNCs begin to approach developing countries, many managers will not be prepared to encounter that the specific needs of developing market consumers are much more complex than they might imagine. Therefore, it is essential for managers to immerse themselves into the developing market context in order to obtain insight into the needs of the local culture and gain the trust of the community. (Prahalad 2010, pp. 13-14) These needs gaps that differentiate developing countries from developed countries are huge. In order to succeed in emerging markets, it is necessary to understand the needs of the community first before commencing with innovation practices to meet those needs. (Trimble 2012, p. 2)

Opportunities for innovation can be found within these need gaps. Five needs gaps have been identified by Govindarajan and Trimble (2012) as: “the performance gap, the infrastructure gap, the sustainability gap, the regulatory gap, and the preferences gap.” (pp. 14 & 42)

In terms of the *performance gap*, Govindarajan and Trimble (2012) highlight that “developing nations are most eager for breakthrough new technologies that deliver decent

performance at an ultralow cost—that is, a 50 percent solution for as little as a 15 percent price.” (p. 15) In order to achieve this, Soni (2013) and Trimble (2012) believe that developed world businesses need to start from scratch and build completely new offerings.

The *sustainability gap* brings attention to that fact that it would cause catastrophic events if the huge populations in developing countries develop in an unsustainable manner. Therefore, developing markets are already proving to confront sustainability issues and are building up the know-how of solving these problems. (Immelt et al. 2009, p. 59) Griffith-Jones (2014) continues by stating, that new infrastructure should be developed innovatively in developing countries in order to encourage sustainability. For instance, infrastructure that utilizes renewable energy would prove very beneficial to developing countries. (p. 4) Looking at the *infrastructure gap* as the next needs gap, Govindarajan and Trimble (2012) share that although it is natural for people to assume that the great amount of dependable infrastructure in the rich world promotes new product development, in developing markets where there is a lack of infrastructure, circumstances may actually prove advantageous. (p. 16) Soni (2013) agrees by sharing that the infrastructure gap allows for breakthrough technological innovations. (p. 161) “There are already several examples of third-world nations with first-world infrastructure...Make a cell phone call in rural Vermont and then in rural Morocco...and you’ll see the difference.” (Govindarajan and Trimble 2012, p. 16)

The *regulatory gap* addresses the fact that regulations in developing nations tend to not be as strict or developed as in advanced countries. Such tight regulations in developed countries tend to interfere with the innovation process. Therefore, less regulatory systems may prove supportive to innovating. (Trimble 2012; Soni 2013) Also supporting the innovation process is the preferences gap, which Trimble (2012) paints as “the world’s great diversity of tastes, preferences, rituals, and habits [that add] spice.” (p. 2) The *preferences gap* addresses the immense range of cultures throughout the developing countries of the world. Different preferences may open up opportunities for companies to explore completely new offerings. As preferences will not only vary between countries

but also within countries there is a great amount of opportunity to explore. (Soni 2013, p. 161)

2.3.4. Clean-Slate Approach in Reverse Innovation

“Reverse innovation begins not with inventing, but forgetting.” (Govindarajan and Trimble 2012, p. 14) Businesses that have been successful in the past tend to get comfortable with the practices and logic that brought them to success. When shifting from the mentality of exporting to developing markets to innovating within developing markets it requires an entirely new mindset. In order to successfully immerse oneself into the process of reverse innovation, it requires a removal of any long-held beliefs or assumptions. Those involved in the reverse innovation process must first become aware of their dominant logic, or assumptions based on past experience, and not allow it to influence their decisions. This means that businesses simply need to start from a blank page. (Petrick and Juntiwasarakij 2011, Govindarajan and Trimble 2012)

In order to create this new clean-slate mindset, it requires greatest efforts from CEO-level staff that are able to gradually introduce this new mindset into the corporation. The ultimate goal is to do this in a way, which allows the reverse innovation mindset to complement the existing dominant logic, company-wide. However, within a particular reverse innovation project, it is then necessary to have a clean-slate approach where dominant logic is nullified. (Govindarajan and Trimble 2012, p. 49)

2.3.5. Local Growth Teams

Clean-slate innovation is a driver of success in emerging markets but in order to establish clean-slate innovation, multinationals need to incorporate a new management model for global, diverse teams to provide valuable contributions to innovation initiatives. (Corsi et al. 2014, p. 34) Govindarajan and Trimble (2012) refer to these teams as local growth teams (LGTs). An LGT can be viewed as a small startup company that is directly connected to the headquarters of the MNC. LGTs encompass a small, multidisciplinary

group of either existing employees or new members who are all located in the developing market for carrying out reverse innovation. These LGTs are essential to the reverse innovation process and maintain a fair level of freedom while having access to the resources of the main company. (pp. 48-54)

The LGT model is based on five critical principles: ‘shift power to where the growth is’, ‘build new offerings from the ground up’, ‘build LGTs from the ground up like new companies’, ‘customize objectives, targets, and metrics’, and ‘have the LGT report to someone high in the organization’. (Immelt et al. 2009, pp. 63-64)

In the innovation process, it is essential to immerse oneself in the context of the work, to become deeply familiar with target market and understand their needs and wants. Through direct, personal engagement it not only allows to understand the needs and wants of the customer, but also hidden needs that the consumers may not even be aware of themselves. (Anthony 2012; Govindarajan and Trimble 2012; Petrick and Juntiwasarakij 2011; Zeschky et al. 2014) It is therefore necessary to *shift power to where the growth is*. In determining precisely where to locate themselves, LGT teams should strategically consider a location situated close to local competitors to monitor their actions, as well as close by to the local market so that the LGT can develop an even greater understanding of the community’s needs. (Govindarajan and Trimble 2012, p. 57)

When commencing the process of reverse innovation, *new offerings need to be built from the ground up*. Some may refer to this as a market-back approach (Govindarajan and Trimble 2012), in which LGTs start by identifying the needs of a local target market in the developing world and then start creating a solution for the discovered needs. (p. 38) Considering the huge differences between advanced and developing markets, Immelt et al. (2009) believe that it’s not sufficient to merely adapt existing, advanced country offerings to the developing market context. Rather, LGTs need to start from scratch. (p. 64)

When embarking in the process of building an LGT, Govindarajan and Trimble (2012) share that *LGTs should be built from the ground up*, as if you were constructing a new company from scratch. “In particular these LGTs must unite people who understand emerging-market needs and people who can provide emerging-market solutions. They

must combine market insight with technical capabilities. They must integrate sales and marketing with R&D.” (p. 55) Complementing this belief, Hutchins (1991; 1995) and Dunbar (1995) as cited in Lin and Beyerlein (2006) assert that heterogeneous teams which have somewhat interrelating backgrounds of experience are more innovative than teams that only entail members with related know-how. (p. 72) Therefore, although there may be employees readily available within the company it is encouraged that companies also look to recruit new employees, as fresh minds and experience will support a fresh start. (Petrick and Juntiwasarakij 2011; Govindarajan and Trimble 2012). However, as long as companies can first identify the skillset and types of talent they would require for the LGT, then they could locate that talent from either internally or outside of the company. (Govindarajan and Trimble 2012, p. 56)

As LGTs are meant to carry out innovation initiatives that are fairly foreign to their existing organizations, it is necessary for *objectives, targets, and metrics to be customized* for them. “Metrics commonly used ... for evaluating performance ... may be of little use to a reverse innovation effort. Therefore, the scorecards for an LGT’s progress should be customized to the project.” (Govindarajan and Trimble 2012, p. 64) As reverse innovation initiatives exhibit an immense amount of uncertainty, there should be high expectations of LGT leaders along with a strict review process; the learning process should be fast and controlled and plans should be reviewed and revised often. (pp. 64-65) Because of the local experience that they will collect, it will be important however for the LGTs to be given the ability to decide upon which solutions would be best to develop for the local market and how those solutions should be produced and distributed. (Immelt et al. 2009, p. 58)

Finally, no matter how small the LGT is, they should *report to someone high in the organization*. Govindarajan and Trimble (2012) suggest that in order for an LGT to be successful, they must create a healthy partnership with the parent company. Multinationals, or the larger enterprise must be ready to allow LGTs to “tap into the parent company’s mammoth enterprise resource base: technology, distribution channels, supply networks, and manufacturing capacity. Such resources are assets that emerging-market competitors can only dream of.” (p. 59)

2.4. Theoretical Framework

The following section will provide an applicable theoretical framework to model the process of reverse innovation. This framework will be used to evaluate the case study presented in section 4. The framework addresses the first research question being: What key theories and principles underlie the process of reverse innovation?

This framework is an adaptation of the existing framework on global innovation flows by Corsi (2012), found in Figure 2 of this thesis. The model addresses 10 various types of reverse innovation through a four-phase innovation flow and further suggests the classifications between advanced and developed country of the location of the innovation phase. (Von Zedtwitz et al. 2014, p. 15) The theoretical framework presented in this thesis was specifically modified to address the process of reverse innovation as a whole, not only as a product life cycle as suggested by Corsi (2012) and von Zedtwitz et al. (2014). The framework ties in extant views of how reverse innovation must be carried out and what elements are present during the reverse innovation process. The following figure represents the theoretical framework of this study. The framework will be described here as well as in the Discussion and Analysis, in section 5.

REVERSE INNOVATION							
Action point		Clean-Slate Approach				Market Introduction	
		LGT Formation	Needs (Gap) Assessment	Concept Ideation	Product Development	Primary	Secondary
Locus of Action Point	1	A	D	A	D	D*	A
	2	A	D	D	A	D*	A
	3	A	D	D	D	D*	A
	4	A	D	A	A	D*	A
	5	A	D	D	D*	A	D
	6	A	D	D	D*	A	A
	7	A	D	A	D*	A	A
	8	A	D	A	D*	A	D
	9	A	D	D*	A	A	A
	10	A	D	D*	A	A	D
Output		Frugal / Cost / Good-Enough Innovation				New Value Proposition	
		Business Model Innovation					
		Organization Innovation					

Figure 5: Theoretical Framework - The process of reverse innovation

Key:

A – Advanced (Developed) Markets

D – Developing Markets

D - Second round of needs assessment for the rich world followed by adaptation of the innovation (if necessary) and then the reversal point of the innovation process as it is introduced from Developing to Advanced Market.*

Dark-shaded row – Strong Reverse Innovation

Non-shaded row – Weak Reverse Innovation

In order to wholly carry out reverse innovation, this theoretical framework offers both a model to review whether an initiative could be considered a reverse innovation or offer a tool specifically for an MNC to plan for a reverse innovation initiative. The framework intends to offer a linear model, like that of Corsi (2012) in Figure 2, which displays steps of how a reverse innovation initiative systematically progresses.

The framework was first divided into ‘Action Points’, ‘Locus of Action Points’, and ‘Outputs’ based on key points extracted from pertinent literature. Some of the ‘Action Points’ are based on the linear innovation model of Corsi (2012) and von Zedtwitz et al. (2014), adopted from Vernon’s initial product life cycle theory: concept ideation, product development, primary target market introduction, and later secondary market introduction.

Although this theoretical framework supports the model that they proposed, it was recognized that it did not appear to fully explain the reverse innovation process as it lacked certain key elements. Therefore, two specific action points were added on to linear model and one overarching point was additionally added. Specifically, these first two action points were ‘LGT formation’ and ‘Needs (Gap) Assessment’. These were added based on the views specifically of Govindarajan and Trimble (2012) as well as additional existing literature on the need for a local (growth) team or subsidiary in the developing market as well as the requirement to carry out a local needs assessment in the developing country.

The point was also highly emphasized by Govindarajan and Trimble (2012) as well as in existing literature that there is a great need for a clean slate approach throughout most of the reverse innovation process. (p. 32) Therefore, the ‘Clean Slate Approach’ was brought into the framework as an umbrella theme, influencing the first four ‘Action Points’ of the linear model from ‘LGT Formation’ to ‘Product Development’.

The mid-section of the framework, or the ‘Locus of Action Points’, displays the 10 different rows indicating the 10 possible linear models for reverse innovation. These rows exhibit the shifts of the locus of innovation between advanced countries and developing countries during the reverse innovation process. The letter ‘A’ in the model stands for advanced (or developed) markets and the letter ‘D’ stands for developing markets. The dark-shaded rows represent strong reverse innovation, having more of the key ‘Action Points’ take place in the developing country, and the non-shaded rows represent weak reverse innovation, having fewer of the key ‘Action Points’ take place in the developing country. The ‘D*’ in each of the rows indicates first the need for a second round of needs assessment directed toward the advanced market and then if necessary, the solution is modified before being introduced to the advanced market.

Traditionally, comparing Vernon’s original view of the product life cycle which according to the model of Corsi (2012) would be modeled as the innovation flow A-A-A-D and the opposite or reversal of that D-D-D-A which most closely relates to the initial definitions of reverse innovation, Corsi (2012) and related authors Von Zedtwitz et al. (2014) set out to map further types of innovation flows that can still be considered

reverse innovation. They ultimately arrived at the 10 potential flows of innovation. In the theoretical framework these are depicted under ‘Concept ideation’ to ‘Secondary market introduction’ and are presented within the numbered flows from 1-10 at the ‘Locus of the Action Point’: 1. ADDA (‘Developing Country Spillover’), 2. DADA (‘Double Reverse Innovation’), 3. DDDA (‘Reversed Product Life Cycle’), 4. AADA (‘Spill-Back Innovation’), 5. DDAD (‘Advanced Country-Targeted Innovation’), 6. DDAA (‘Developing Country Innovation’), 7. ADAA (‘Cost/Capacity Innovation’), 8. ADAD (‘Reverse Spillover’), 9. DAAA (‘Front-End Reverse Innovation’), and 10. DAAD (‘Developing Country-Inspired Product Life Cycle’). The descriptions of each flow can be found in Appendix 1. The names of each innovation flow were provided by Corsi (2102) and von Zedtwitz et al. (2014). From this, it is apparent that a process of reverse innovation can begin both in an advanced or developing country once there is a subsequent flow of the innovation from developing to developed country.

However, as the theoretical framework of this thesis adds on the two action points of ‘LGT Formation’ and ‘Needs (Gap) Assessment’, there emerges additional shifts of the locus of innovation. This thesis took the stance that a needs (gap) assessment must first take place in the developing market, hence, why there only exists the letter ‘D’ in the column under ‘Needs (Gap) Assessment’. Based on evidence from literature, in order for a needs (gap) assessment to take place, there needs to be a local growth team present in the developing market to carry out this assessment. Taking into consideration that the local growth team first emerges from the headquarters of the Western MNC – according to literature – implies that, no matter what the reverse innovation initiative will begin with the formation of the local growth team in an advanced market, hence, why there only exists the letter ‘A’ in the column under ‘LGT Formation’. The incorporation of this aspect purely follows the information illustrated in extant literature regarding the process of reverse innovation. It does not reflect the potential of an emerging market MNC or another type of organization or initiative to engage in the reverse innovation process.

Finally, the third aspect of the theoretical framework are the outputs, or what emerges from certain parts of the reverse innovation process. This part of the framework incorporates the theory by Zeschky et al. (2014b) that they formed “based on a survey of

the literature and a series of case studies... that there are three distinct types of resource-constrained innovation for emerging markets: cost, good-enough, and frugal innovation.” (p. 21) This portion of the theoretical framework also incorporates earlier views published by Zeschky et al. (2014a) illustrating that reverse innovation is built off of not only frugal innovation but also business model innovation and organization innovation. (p. 257) As the theoretical framework displays, this thesis takes the stance that resource-constrained innovation – either frugal, cost, or good-enough – business model innovation, and organization innovation all take place before initial introduction into the primary market.

The theoretical framework then sets out to display that upon both primary and secondary new market introductions, the innovation generates new value propositions for each particular market. This fact holds both true and necessary based on extant literature. Many authors cover the fact that not only does the price point need to be lower in reverse innovations but also ultimately there should be a greater value delivered. Petrick and Juntiwassarakij (2011) share that value signifies meeting the consumer’s needs as well as providing a solution that will be dependable even in harsh environments. (p. 27) They continue by stating “value, in emerging markets, means reducing products and services to their essence. Products have to meet the needs of the consumer and work reliably in challenging environments.” (p. 27) On the other hand, when introducing these innovations into advanced markets, they may provide new value to the lower-end of the market, potentially even being disruptive, as no other similar solution may exist at that time for that specific market. (Sinha 2013, p. 70) Although when initially reversed into the advanced market, these solutions may not be attractive to the high-end consumers, but after time and further development, the reverse innovations may even prove to add greater value than the existing solutions to high-end consumers.

Ultimately, when each of the elements of this theoretical framework have been put into action, this thesis takes the stance that then ultimately the process of reverse innovation will be successfully complete. In the following section, the methodology of this thesis will be presented. Later in the discussion and analysis, the theoretical framework will be utilized to evaluate whether a process of reverse innovation is evident in the case study.

3.0 METHODOLOGY

The previous section reviewed pertinent literature on innovation and collaboration in developing countries and the phenomenon of reverse innovation, after which a theoretical framework was introduced for the process of reverse innovation. This section presents the methods that were utilized in carrying out this study. First, the research methodology will be explained followed by an overview of the data collection methods and finally the limitations of the study will be presented. Particular attention will be brought to the methodology used in the empirical research.

3.1. Research Methodology

The research carried out for the purpose of this study was gathered in two parts. The first part consists of the theoretical research, which was gathered in order to develop an understanding of the phenomenon of reverse innovation and innovation and collaboration in developing countries. The theoretical analysis helped to answer the first established research question since appropriate aspects of the theoretical research on reverse innovation were adopted into a theoretical framework to establish a comprehensive model of the elements involved in the reverse innovation process. The empirical component of the study consists of a real-life study of an ongoing collaborative initiative. The empirical data of the collaborative initiative was examined through the lens of the theoretical framework of the process of reverse innovation. This was done in order to reach the main purpose of the thesis, to decipher whether reverse innovation can be carried out collaboratively. Analysis of the empirical data further allowed for an adaptation of the initial proposed theoretical framework in order to pertain to a specific collaborative reverse innovation initiative, as opposed to the initial framework representing an individual model for carrying out reverse innovation. Assessment of the empirical data further allowed for the additional offering of two models relevant to setting up a collaboration and carrying out innovation in Uganda, to compliment the other

findings. Each of the above-mentioned outputs helped to answer the three remaining research questions and these findings presented through the discussion and analysis could be viewed as new theory in the field of reverse innovation.

As the phenomenon of reverse innovation is dynamic and multifaceted, it requires years of gathered data. (Govindarajan and Trimble 2012, p. 207) For this reason, several methodological approaches were utilized for the research of this thesis.

Overall, this thesis follows a phenomenological paradigm and the process chosen for this thesis was a qualitative approach. Collis and Hussey (2003) describe the qualitative approach as “subjective in nature and involves examining and reflecting on perceptions in order to gain an understanding of social and human activities.” (p. 13) Therefore, the ontological assumption in this thesis is that the domain of research is “socially constructed and only understood by examining the perceptions of the human actors.” (p. 48) Within the phenomenological approach, it is affirmed that there may be no relevant existing theory...[and] therefore, you may carry out your investigation in order to construct a new theory...to describe different patterns which emerge in the data.” (Collis and Hussey 2003, p. 57) This was the case as there was no specific theory established on collaborative processes of reverse innovation. So the author utilized what theory was available on reverse innovation and carried out an investigation on the collaborative initiative that she had been a part of in order to first decipher whether such an initiative could engage in a process of reverse innovation. The author subsequently adapted her original theoretical framework to describe the elements emerging out of the empirical data, which were applicable to carrying out reverse innovation collaboratively.

Abductive logic was utilized in order to abduce a hypothetical explanation, in the form of the adapted framework relevant to a collaborative process of reverse innovation, based on the observations presented in the case study. According to Ong (2012), “The idea of abduction...refers to the process of generating social scientific account from social actors’ accounts.” (p. 422) They continue by sharing, “the aim of the [abductive research strategy] is the construction of theories that are grounded in everyday activities, in the language and meanings of social actors.” (pp. 422-223)

Epistemology follows that phenomenologists attempt to minimize the distance between the researcher and that, which is being researched. They may be involved in different forms of participative enquiry.” (Collis and Hussey 2003, p. 48) “The abductive strategy entails... epistemological assumptions [regarding] ‘social scientific knowledge as being derived from everyday concepts and meanings, from socially constructed mutual knowledge’ (Blaikie, 2000, p. 116).” (Ong 2012, p. 424)

The research of the thesis itself incorporated the case study methodology with ethnographical elements. When looking more closely at the research approach employed through the collaboration in the case study, it was carried out with an action research methodology. As the author was directly involved as a participant in the collaboration it can be argued that part of the research was carried out with the action research approach. Collis and Hussey (2003) share the term ‘action research’:

“Was coined by Lewin (1946) who saw the process of enquiry as forming a cycle of planning, acting, observing, and reflecting. The planning stage is concerned with identifying an objective, which it is intended to achieve, and how this may be done. The first phase of action is implemented and its effects observed and reflected on before modifying the overall plan, if appropriate...The main aim of action research is to enter into a situation, attempt to bring about change and to monitor the results.” (p. 67)

Further according to Collis and Hussey (2003), “improvement and involvement seem central to all users of [action research].” (p. 67) During the course of her involvement, the author acted as a member of the collaborative initiative, collaboratively seeking for improvement.

For the sake of specifically this thesis however, a case study methodology was exercised. Sharing the views of Yin (1994), Collis and Hussey (2003) identifies particular characteristics of the case study methodology:

“- The research aims not only to explore certain phenomena, but to understand them within a particular context

- *The research does not commence with a set of questions and notions about the limits within which the study will take place*
- *The research uses multiple methods for collecting data which may be both qualitative and quantitative.” (p. 69)*

The case study was presented in a narrative format to collect information together, and present it in one, clear arrangement. It was built entirely on the basis of primary data experienced, observed, or gathered over the course of 2.5 years. The case reaches back to the start of the collaboration to follow its progression, bringing light to the actors that played a part in the work as well as the development and flow of the innovation between the advanced and developing countries. By focusing on the Elephant Tap in particular, it allows for an understanding of the product's life from needs assessment to product development. Ultimately, the information provided in the case study seeks to present past events and examine it through current theory in order to generate new findings. This approach is referred to as an explanatory case study, or “case studies where existing theory is used to understand and explain what is happening.” (Collis and Hussey 2003, p. 68)

Elements of the ethnographic approach were also incorporated into the methodology. With ethnography, “the research normally takes place over a long period of time, often many months, in a clearly defined location...The aim of the methodology is to be able to interpret the social world in the way that they members of that particular world do.” (Collis and Hussey 2003, p. 71) An ethnographic approach was incorporated to specifically understand the Ugandan context and be able to recognize how innovation should be carried out in Uganda.

3.2. Data Collection

In the phenomenological paradigm, “the emphasis is on the quality and depth of the data. Therefore the data you collect will be mainly qualitative data. The data is often referred

to as being rich, since it captures the richness of detail and nuance of the phenomena being studied.” (Collis and Hussey 2003, p. 57)

Typically, “the methods used to collect data in a case study include documentary analysis, interviews, and observation.” (Collis and Hussey 2003, p. 69) In ethnography, participant observation is a main method of collecting data in which, “the researcher becomes a full working member of the group being studied. (p. 71)

Collis and Hussey (2003) suggest that within a phenomenological approach, unstructured or semi-structured interview technique be utilized for data collection in a few specific instances including:

- “- The interview may be reluctant to be truthful about this issue other than confidentially in a one-to-one situation.
- It is necessary to understand the construct that the interviewee uses as a basis for his or her opinions and beliefs about a particular matter or situation.” (p. 168)

The interviews were not recorded and carried out in an unstructured or semi-structured approach specifically for two reasons. The first was to allow for open discovery and the second to employ an interview method in the Ugandan context that would not cause interviewees to be reluctant to answer honestly. Based on her experience in Uganda already, the author found that recording the interviews or formalizing them would negatively affect the quality of the information received. Therefore, notes were recorded either during the interview, immediately after, or both. All interviews were carried out face-to-face, some were one-on-one and due to the unpremeditated nature of Ugandans, other interviews introduced additional interviewees into the session. Additionally, there were cases where the author was given the opportunity to both observe a meeting and ask interview-style questions. Interviews were specifically carried out with a Google representative in Uganda, an employee at a local incubation hub, UNICEF employees and current or ex-consultants, the Vice Chairman of the Board at ICT Association of Uganda, one foreign and two Ugandan entrepreneurs – one of those also being the representative at the General Consul of Finland in Uganda, employees at a local Ugandan NGO, and at the Ugandan Investment Authority.

Observation in a natural setting was another predominant method of gathering data towards the thesis. Observation in a natural setting is “a research environment that would have existed had researchers never studied it.” (Collis and Hussey 2003, p. 171) Both tools of non-participant observation and participant observation were utilized over the course of the data collection. Participant observation, which is defined as “a method of collecting data where the researchers is fully involved with the participants and the phenomena being researched” (p. 171), was utilized more towards the beginning of the research particularly when the author was participating in the collaboration. Non-participant observation, which the authors explain as being carried out “to observe and record what people do in terms of their actions and their behavior without the researcher being involved” (p. 171) was carried out later in the research process. This was specifically evident when the author would sit in on meetings as an outsider, to simply observe progress. In all cases, notes were written down into a research journal to document relevant information. “The main advantage of note taking for recording qualitative data is that you can record your observations and responses to questions immediately.” (p. 192)

The data was all collected within a research journal, which was kept over the duration of the author’s involvement with the collaboration. This was especially relevant during the author’s personal involvement as a team member in the collaboration, as the notes that were taken contributed significantly to the information presented in the case study.

3.3. Assumptions and Limitations of Study

There are certain aspects of the research that need to be taken into consideration, as it was subject to certain limitations. The credibility of the research will be further discussed in this section.

The fact that reverse innovation is a very young field of research. Authors are still trying to make sense of the fundamentals of reverse innovation, so taking it a step further by examining different methods for carrying out reverse innovation was quite challenging and proved to be very ambiguous. The author’s unique position to gain full access to the

knowledge related to the collaboration, allowed for high validity of the research, as the findings display an accurate representation of the real situation. However, the limited theory on reverse innovation and lack of theory on collaborative reverse innovation put the author in the position to need to make numerous assumptions which may have led to low reliability of the study.

As extant literature covers reverse innovation in the context of MNCs, the initial theoretical framework of this thesis was formulated based on the literature pertaining specifically to MNCs. By using this framework to assess the case, not only was it assumed that this framework is a valid representation of the process of reverse innovation but also it can be debated how accurate the assessment of the case study was as a collaboration predominantly run by UNICEF and academia was being examined through the framework established for an MNC. Although the framework fit fairly easily into the collaborative process described in the case study, the action point which could be most questioned is that of the LGT formation. In existing literature, thus in the context of MNCs, LGTs were explained as a type of subsidiary, or branch of the MNC. It was also discussed however that LGTs should be very independent and almost act as their own start-up company that was separate but still supported by the MNC. This characteristic of the LGT allowed for a comparison of it to the project team formation presented in the case study. Therefore, it was assumed that the project teams exhibit sufficient enough characteristics to be labeled as a type of LGT, however the credibility of that assumption could be debated.

Before assessing the case study, some of the participants presented in the case were requested to review the case after it was written to ensure the reliability of the information. When assessing the case study through the use of the theoretical framework, the fact arose that innovation activities were occurring concurrently in both Finland and Uganda, or that the work associated with one of the Action Points was carried out both in Finland and Uganda. For the sake of assessing the case study, it had to be established in which country the bulk of the Action Point was carried out. This was deciphered through the author's personal experience in the collaboration, therefore having a great understanding of where and for how long the work was carried out. As the author did not

have a tool for assessing in which country the bulk of each Action Point was carried out, some may argue that the assumptions made were not credible.

When dividing up countries into purely advanced or developing country, by using the term developing country it generalizes amongst the different classifications of types of developing countries. Several authors have offered various classifications for developing countries. For instance as seen in Figure 1, Cavusgil, Knight, and Riesenberger (2008) offer the classification of developing markets as either emerging nations, transition economies, or developing economies. (Aschmoneit and Janevska 2013, p 37) In order to maintain a degree of simplicity within such a complex topic, especially since the phenomenon is still quite young, it was decided that the two main distinguishing categories of advanced and developing country would be utilized, using the term developing country to represent all countries that reside beneath the category of advanced country. After all, the reversal for the flow of innovation to occur is only needed between a developing country and an advanced country.

The proposed frameworks also do not touch upon the amount of time that should be utilized for each phase of the reverse innovation process. The information in the case study may provide a general idea of how long the four first action points of innovation may take (from LGT Formation to Product Development), however it would need to be discussed more in detail in order to make generalizations of how much time each phase of the process may take.

Furthermore, although it was established that it is possible to carry out reverse innovation collaboratively, a general framework for doing so was not produced. The adapted framework focused specifically on a frugal innovation initiative evolving into a reverse innovation with the parties of UNICEF, academia, and advanced country private sector collaborating. Therefore, the outcomes of this study do not produce a generic model for assessing reverse innovation through collaboration.

Finally, as the case study was proven to have not yet completed a process of reverse innovation, assumptions were made based purely off of claims that were made which signified the possibility of the Elephant Tap being introduced to Finnish market. Thus,

the adapted framework for collaborative reverse innovation was developed based partially off of assumptions. Although the likelihood of the collaboration to continue as concluded is high, the legitimacy of the assumptions made are still poor as they cannot yet be proven true.

The following chapter will present the Case Study of this thesis.

4.0 CASE STUDY

4.1. Case Study Context: Uganda

Originally colonized by the British, Uganda or ‘The Pearl of Africa’ is an African country with a steadily growing population about 36 million. A great amount, over 45% of the population consists of youth or 0-14 years – the largest percentage of youth in the world. Uganda’s political environment encompasses several different parties, but is currently led by the National Resistance Movement with President Museveni as the head, supported by a vice president and prime minister.

Uganda is a nation that went through a state of political unrest for several years as it has been ruled by harsh dictators and human rights abusers, but “since the late 1980s Uganda has rebounded from the abyss of civil war and economic catastrophe to become relatively peaceful, stable and prosperous.” (BBC 2014) “Since 1990 economic reforms ushered in an era of solid economic growth based on continued investment in infrastructure, improved incentives for production and exports, lower inflation, better domestic security, and the return of exiled Indian-Ugandan entrepreneurs.” (CIA 2014) It is forecasted that Uganda will have “an increase in real GDP growth to an annual average of 7% in 2015-17 as external demand rises, and to 12% in 2018-19 as oil production starts.” (Economist Intelligence Unit n.d.)

“Uganda has substantial natural resources, including fertile soils, regular rainfall, small deposits of copper, gold, and other minerals, and recently discovered oil...Agriculture is the most important sector of the economy, employing over 80% of the work force. Coffee accounts for the bulk of export revenues.” (CIA 2014) It is especially significant for firms to take into consideration that the government of Uganda has now prioritized development in the sectors of ICT, tourism, agriculture business, and oil & gas, and the ICT and agriculture sector have been sectors showing great potential for growth and innovation.

Religion, especially Christianity and Islam, plays a significant role in the daily lives of Ugandans. There are numerous tribes, clans, and languages spoken throughout Uganda as well. The main languages are English and Swahili, and Lugandan is mostly spoken in Uganda's capital city Kampala.

Latest data places Uganda low on the Human Development index – 164 out of 187 countries and territories. (UNDP 2014) Throughout Uganda, there are major issues with waste management and water, sanitation, and hygiene. This especially becomes prevalent in the rural areas where people may need to walk a few kilometers to reach a source of drinking water and for toilets they use pit latrines, which are often found in poor, unhygienic conditions. These issues have great negative impacts on the health of Ugandans, especially concerning acquiring infectious diseases. The most vulnerable are females and children under age five. Additionally, “instability in South Sudan is a risk for the Ugandan economy because Uganda's main export partner is Sudan, and Uganda is a key destination for Sudanese refugees. Unreliable power, high energy costs, inadequate transportation infrastructure, and corruption inhibit economic development and investor confidence.” (CIA 2014)

4.2. Case Collaboration

Foreword

For nearly 4 years, the Finnish Committee for UNICEF (UNICEF Finland) has been collaborating with Aalto University of Finland, Makerere University of Uganda, and UNICEF Uganda. It is a novel partnership with the aim of developing sustainable, Human Rights Based innovations for children in the context of rural schools in Uganda. The focus of the innovations has been within the Water, Sanitation, and Hygiene (WASH) sector of UNICEF.

UNICEF has deep experience with working in developing countries and also conducts heavy research, with access to information-rich databases. Therefore, partnering with this development organization not only gives access to years of experience and information from developing countries but also to a respected network within developing countries.

Aalto University of Finland was established by the merging of Helsinki School of Economics, Helsinki University of Technology, and University of Art and Design Helsinki. It excels in multidisciplinary education and research and runs flagship Master's multidisciplinary programs in which designers, engineers, and business students take part. Some of these programs are held as courses and some are full Master's programs.

Makerere University is a leading university in Uganda. It is made up of nine different colleges, two of which the collaboration becomes involved with – the College of Engineering, Design, Art, and Technology and the College of Health Sciences. Makerere also runs a unique program called Innovation Systems and Clusters which is aimed at solving real problems through multidisciplinary teams, mixing local government, business, and university researchers.

Chapter 1: Planting a New Seed

(September 2010 – August 2011)

Finland

Upon opening the doors for his first visit to Aalto Design Factory (ADF), at Aalto University in Finland, Christopher Fabian – the current senior advisor of innovation, at UNICEF headquarters in NYC – knew that this was the start of something new. Little did he know what would grow from the seed he had just planted.

In September 2010, at a time when UNICEF was starting to build innovation labs around the world, Christopher arrived in Finland with the plan to benchmark the ADF model. This model is a project within a physical factory space that provides a constantly developing, collaborative environment for students, staff, researchers, and business partners.

Christopher's visit to ADF not only introduced him to a one-of-kind learning environment but also to Andrew Clutterbuck, the Coach at ADF. Playing the common role of a coach, Andrew had the task of not only evangelizing the ADF model but also helping to build and sustain a community within ADF that encourages passion, learning, and co-creation. With Christopher and Andrew's passion for innovation and drive for sustainability, it was no surprise that upon their first meeting conversations of collaboration already began to brew. Lo and behold, in November 2010, UNICEF Finland and Aalto University signed a cooperation agreement under the basis that over the following eighteen months there would be a pilot project run between UNICEF Finland and ADF.

This novel collaboration of public sector and academia would create fertile grounds for establishing new ways of sharing knowledge and solving problems. The university students to be involved in the project would gain insight into current development challenges and methods being use by UNICEF to overcome these problems and UNICEF would gain insight into new ideas and ways of innovating.

The first months were dedicated to building a solid foundation, which meant establishing a communication plan, discussing different ways of collaborating, and exploring relevant parties to involve from Aalto University. By January 2011, Andrew was already on an airplane with two other Aalto representatives headed for UNICEF HQ in New York. The purpose of this trip was to not only introduce Aalto University representatives to UNICEF but also to further discuss the developing collaboration and set objectives for the group's field trip to a to-be-determined UNICEF country office.

The two parties engaged in various workshops and ideation sessions during their New York visit, which helped to establish the foundation for the collaboration. It was ultimately determined that a representative from UNICEF HQ, Miriam Azar, would relocate to UNICEF Finland as a representative for the collaboration. Also, Uganda was chosen as the country of focus for the collaborative project to take place between select Aalto University students and UNICEF Finland as the project sponsor. Uganda was chosen as it is a forward-thinking country with an environment and people who prove to exhibit the necessary mentality to allow for change to happen for the better. One of UNICEF's Innovation Labs is also located in Uganda's capital city, Kampala. Additionally, the UNICEF Uganda country office has been leading in various areas of work including its use of information and communications technologies.

After returning from New York, Andrew was introduced to Irena Bakic, an Aalto University student who would soon be traveling to Uganda to research and develop products for a school project of her own. After brief discussions, it was decided that she would join as a member of the project planning team. This would involve her not only to share information from her upcoming experience in Uganda but also to help coordinate a schedule for when she along with Aalto and UNICEF representatives would travel to Uganda in five month's time to further plan and explore possibilities for the collaboration. Irena gladly became involved and was able to play a vital role from the beginning as she was able to establish a good base network when in Uganda, supported also by the existing UNICEF Uganda network for which the representing team could immerse themselves into upon their arrival.

Uganda

Those five months flew by and in June 2011 Andrew, along with Miriam and an Aalto University student who would be documenting the trip, embarked on their first visit to Uganda, where they would connect with Irena and be introduced to ‘Pearl of Africa’. The purpose of this trip was not only for the team to be immersed into the Ugandan culture but also to establish the scope of the project for the upcoming school year and student project teams which would commence in September 2011.

In Uganda, the team of four carried out meetings, workshops, and further ideation sessions, with UNICEF Uganda, a local university – Makerere University – and other relevant contacts that Irena had made during her time in Uganda. Over the course of these events, the team was able to map out the project and establish its scope within UNICEF’s Water, Sanitation, and Hygiene (WASH) branch. The vision for this project would be to empower children through social innovation and create localized, sustainable solutions for them. The area of focus would be in Northern Uganda, in a district called Gulu, and the project’s target audience would be rural school children. Though the focus would be on the Gulu region at first, UNICEF expressed that they would ultimately like for solutions to be scalable nation-wide.

While in Uganda, it was decided that both Makerere University and the UNICEF Uganda country office would additionally be involved as local partners. The idea behind involving Makerere as a partner would be to integrate local Ugandan students into the project as remote team members, as the teams would be predominately based in Finland. In order to involve Makerere students, both Aalto and Makerere University representatives had to develop a mutual understanding of each other’s working schedules and how to remotely involving Makerere students could work in practice.

Finland

Back in Finland, shortly before the start of the 2011 school year, meetings and final decision making were in order to establish which Aalto University students would have

the opportunity to take part in such a unique, innovation project alongside the Makerere University students. How were these decisions made? There were only a few Master's programs and courses to choose from at Aalto University, which were directly involved with ADF, meaning that these courses either held lectures at ADF or were organized by ADF. Andrew took charge from Aalto Design Factory's side and examined how UNICEF could be connected with the courses that run at ADF as well as courses that might relate to UNICEF's values. Ultimately, after Andrew met and connected with staff from each of these applicable programs and courses, it was decided that there would be two multidisciplinary student projects both taking place simultaneously within the academic year, from September 2011 to May 2012. One was a course organized by ADF called Product Development Project (PDP), PDP is an academic-year-long course hosted by Aalto Design Factory and based on the philosophy of problem-based learning. PDP teams, each working with an industry client, will typically encompass over 10 students, one of them acting as a project manager, and the outcomes will be physical, functional prototypes. pdp.fi/course-overview/what-is-pdp/

The other Aalto program to be involved was the Master's program of International Design Business Management (IDBM), which joins Master's students from the School of Business, School of Art, Design and Architecture, and the School of Science. IDBM is driven by multidisciplinary work, creative business models, and design driven innovation. The program organizes multidisciplinary student industry projects each year as one of its courses. The teams typically encompass 4-6 interdisciplinary students and the outcome of the 8-month projects is a conceptual, innovative business model. www.aalto.fi/en/studies/education/programme/international_design_business_management_biz_master/.

As PDP student teams have a project manager, it was already decided that Irena, still an active full-time student at Aalto, would enroll in the PDP course that year and commit as project manager to the Aalto-UNICEF team. Through Irena's past and continuing involvement in establishing the collaboration and soon to be managing the PDP project team, she would prove to be a key liaison not only between PDP and IDBM project teams but also as a contact person for UNICEF. Andrew, as the Aalto-UNICEF project

coordinator, would also serve as a key liaison in the communication with academia as well as a team mentor.

In many ways this collaboration was the first of its kind. It was the first time for PDP and IDBM to collaborate on a joint project. It was also the first time for project sponsor UNICEF Finland along with UNICEF Uganda to collaborate with academia.

This case project with UNICEF Finland as the sponsor differed from the traditional projects since UNICEF Finland wouldn't necessarily advise the project team but instead take the role of a facilitator. UNICEF Uganda, as a partner of the project, would take the advising role by sharing their expertise and making relevant introductions and connections between the student team and local UNICEF officers, schools, and other relevant contacts. Considering that Christopher Fabian from UNICEF New York HQ was also advising the team particularly in the field of innovation in UNICEF, proved how much importance UNICEF wanted to place on new concept development projects such as this one.

Chapter 2: The Pilot Project

(September 2011-May 2012)

Finland

The 2011-2012 academic year marked the kick-off of two multidisciplinary projects sponsored by UNICEF Finland.

Four multidisciplinary students were placed in the IDBM team and a team of eleven multidisciplinary students was chosen for the PDP team. In the tradition of PDP having students from foreign universities working remotely in the teams, there were four participating students from Makerere University chosen by Makerere University professors and one student from Swinburne University of Technology of Australia welcomed into the team.

The teams would work under the one common area of Water, Sanitation, and Hygiene (WASH) with the aim of having a bottom up approach in conceptualizing an innovative business model and developing complementary products, for rural school children in Uganda.

The IDBM team's specific task, assigned by UNICEF Finland, was to create a business model that is owned and run by the local community, addressing the need for sustainable human waste disposal and management in schools. In order to do so, they needed to do background research on existing business models and systems that correlated to their area of study, map opportunities for business in the local communities, and ultimately design a concept that heavily involved the local community through utilizing local labor and resources.

The goal that UNICEF Finland exclusively gave to the PDP team was to craft a local solution for waste management within WASH. More specifically, the team was asked to improve safety and access to WASH in schools in Uganda through developing a sustainable product that could be part of a larger system. They were tasked with identifying key issues and their adjoining systems that need to be taken into account when designing WASH product innovations. It was also requested by UNICEF that the team utilize local resources in their design.

Although the IDBM and PDP teams were given their individual goals, their collective role was quite ambiguous in the large scope of the collaboration as well as how they would execute their individual tasks while supporting each other. Taking their traditional roles into consideration, PDP believed that IDBM would create the business model around their physical solutions and IDBM trusted that PDP would construct a physical solution to compliment the business model that IDBM would create. Undoubtedly, there were mixed views and misunderstandings of each other's roles.

In typical IDBM and PDP fashion, both project teams started off with building a project plan for the year and gaining a thorough understanding of the subject through background research. Part of this background research involved a field research trip, in which both teams would visit Uganda for a 2-week period. Using what resources they had in order to

familiarize themselves more with Uganda and how UNICEF works there and around the world, they utilized the interview technique to extract information from both UNICEF representatives and Ugandans in Finland as well as their fellow, remote Ugandan teammates and other relevant individuals who exhibited expertise within the scope of their project. UNICEF Finland additionally provided training to the teams on how to work in Uganda.

Uganda

Once their preparatory work was completed, in late October 2011 the teams embarked on their first 2-week field visit to Uganda, where they would spend time both in Kampala, Uganda's capital city and the basis of UNICEF Uganda as well as on the field in Gulu. When in Uganda, the team found it beneficial to have meetings and workshops with representatives from UNICEF Uganda in Kampala and also UNICEF's field office in Gulu in order to gain valuable insight towards their research. The teams also made an effort to map out the all stakeholders involved in the collaboration, to be able to pinpoint exactly who would be directly/indirectly involved during and after the project.

New insights and information allowed them to discover problems that clearly needed to be dealt with first before tackling the subject of human waste management, which UNICEF had initially requested of them. The students also recognized the importance of thorough communication between the two teams. They realized that they couldn't work in their separate teams, while aiming for one collective concept without sharing knowledge actively.

While in the field in Gulu, the teams figured that in order for their outputs to have an impact in the school systems, they needed to look deeply into all areas related to WASH in schools there. In order to gain an understanding of the Ugandan culture and society, the teams visited various Ugandan, churches, companies, etc. As the team of Aalto and Makerere University students was so large, they decided to divide themselves into 4 teams and each work at a different school in Gulu in order to make the most out of their short timeframe. Although the schools appeared to initially have a lot in common, they

each had very different environments, economic situations, and daily routines. To add on to the complications, the schools each had different ways of accessing water; some school's students had to travel across main roads to boreholes to collect water, and other schools had access to the municipality's water pipes but didn't necessarily have enough funds to afford its use. There were some schools that even needed to temporarily close down if their borehole wasn't able to provide them with water. Aside from this, the teams also recognized the lack of proper knowledge, planning, and follow up of government and aid organizations that have tried solving similar WASH problems in schools. The problem was that Westerners who believed they had the answers to all the problems, would typically implement solutions without necessarily first testing them in the field or creating an ecosystem around them. This would lead to solutions becoming unusable and not working due to lack of ownership and knowledge of how to maintain the solutions.

Taking this into consideration, along with the complexity of the field of WASH, the students recognized that they needed to come up with more than just one solitary solution. After a few hard days' work and several meetings, the teams each reached the conclusion that the most prominent issues in WASH were related to hand washing. The students had discovered that either schools in Gulu had a problem with shortages of hand washing units or broken, even stolen, taps connected to the hand washing units. All of these problems factored in to hand washing being a very seldom activity carried out by pupils, a primary cause of spreading disease.

Finland

In January 2012, during the cold winter months in the Nordic region, the Makerere University students were brave enough to travel to Finland in order to become acquainted with the culture of their fellow PDP teammates. During the course of the previous months, in order to keep UNICEF updated on the progress, the teams would typically organize checkpoint meetings with Miriam, the UNICEF Finland project representative, who would help keep the project communication flowing through UNICEF channels. As all of the team members were present in Finland, they presented a progress update to the entire

UNICEF Finland office. This trip also allowed the PDP and IDBM teams to bring their heads together and develop a common direction for the project with the focus on proper hygiene. With the common direction in mind, both IDBM and PDP teams started to work fairly independently on their tasks.

Predominately Finland / Partially Uganda

From January to February 2012, as the PDP team began to develop their concepts and prototyping was carried out first by the Aalto students Finland and then by the Makerere students in Uganda, the IDBM team began to establish the concept of Clean School in Finland. This would be a type of umbrella concept and system for a group of various activities focusing on hygiene and hand washing that would become an accepted common practice at the schools in Gulu.

With the information that the PDP team gathered for their concept and prototype development, they developed three concepts. One concept was for latrines (toilets), another concept was for hand washing, and the third was for water transportation. The hand-washing concept involved designing a robust hand-washing tap, later to be named the Elephant Tap, which would be difficult to damage and steal. The PDP students would also design a product to help children transport water and a unit to help monitor the use of hand washing units and latrines. Adhering to UNICEF's wishes, the students planned that these solutions would be manufactured locally.

Predominately Uganda / Partially Finland

Although the whole PDP team didn't join next time around, in late Winter 2012 project manager Irena along with the IDBM team had a second trip to Uganda with the plan to test their initial concepts and further developing them based on new findings.

Being in Uganda allowed for an ideal time for the IDBM team to present their developments to UNICEF Uganda. Irena, and one of her local Makerere University

teammates, also presented their team's progress to the representatives at UNICEF Uganda in order to receive feedback and suggestions towards their progress. In response, although UNICEF was pleased with all three concepts, they put highest preference for the team to continue the development of the water transportation since they deemed it most important at the time. However, Irena along with the 4 Makerere teammates decided they did not want to forgo their other two developing concepts. Therefore, they took this opportunity to also manufacture the first prototypes of the hand-washing tap first in Kampala and then planned to bring them up to Gulu to test in two schools.

Finland

Once Irena and the IDBM team returned to Finland, Irena was able to brief her team on the progress that she had with their Makerere University teammates. At this stage of both projects, the teams had specific tasks to complete for IDBM and PDP respectively. The teams came to discover that although IDBM had developed a Clean School concept and PDP established a number of tangible prototypes each for a specific problem – these prototypes exhibited the qualities in order to fit within the concept of Clean School.

At the final stages of the project, it was quite clear that the teams came up with a different solution than what they initially set out to achieve in the start. As research and new information was accumulated along the way, it challenged them to continue to develop their concepts and designs beyond what their initial goal was.

The final functional prototypes that the PDP team developed for their initial three concepts were: the Elephant Tap accompanied by a hand-washing tank and soap dispenser, a Water Transportation unit as a trolley and backpack, and a remote GMS monitoring system, each aiming at achieving both innovation and functionality in the WASH sector.

The final model that IDBM presented was that of Clean School, a concept and development framework consisting of incremental steps which seek to change the behavior of hygiene at schools and challenge them to not only rethink hygiene but also

become active promoters of good hygiene. Clean School aims at building a network and encouraging behavioral change through first motivating school systems and ultimately the community towards better hygiene practices. It does this by associating hygiene with a feeling of accomplishment and fulfillment, achieving a status symbol within the community. Through each of its steps, the idea behind Clean School is learning by doing. Attention was given to establishing Clean School as a sustainable concept that could be locally owned and one that also provides a solid foundation to incorporate the PDP-developed solutions as well as other future solutions.

As you will come to notice, this was the only year in the first 4 years that both the IDBM and PDP programs were involved in the Aalto-UNICEF project. The reason being, by carrying out the project in both of these courses, it was initially projected that each team would provide benefits from their different approaches – IDBM’s conceptual approach and PDP’s approach of establishing tangible prototypes. However, there were great difficulties in both teams doing so and executing this together. There were also limitations from UNICEF’s side as this type of collaboration was new to them and they didn’t know how to best support both teams especially in terms of which clear roles should be played out by the UNICEF project coordinator. Luckily, Andrew and Irena had previous experience in working with UNICEF, as well as knowledge of the field, which they were able to share with the rest of the team during the course of the project.

Chapter 3: AGI Summer Implementation

(June – August 2012)

Finland

In May 2012, a summer implementation project was given the ‘OK’ to run from June-August 2012 with the focus of implementing the solutions. Aalto Global Impact (AGI), an organization within Aalto University that supports and facilitates the University’s global research and educational programs directed towards sustainable, societal impact,

would be the supportive partner in the collaboration, supporting the implementation and educational activities.

The team – consisting of Andy as the project manager, along with Irena, one prior IDBM student, five prior PDP students (three of those being Makerere University students), one intern from Aalto Design Factory, and one PhD student– convened in Finland, with limited time to make arrangements prior to their implementation trip to Uganda.

The plan was to further test, develop, and implement IDBM's outcome of Clean School and PDP's three prototypes in Gulu. Further testing and developing the solutions would allow the team to evaluate the effects and relevance on rural schools in Uganda of each of the proposed solutions.

UNICEF Finland requested that the team document the field implementation as well as the findings in order to support scalability and create a more fluid continuation process for both UNICEF and future stakeholders. Therefore, the team decided from the start that certain communication channels would be set up in order to keep everyone up-to-date. In addition to newsletters being sent regularly to UNICEF, a blog would be created, as well as a twitter account and Facebook page, where stories and information could be shared. Ultimately, the team wanted to try to create a style of communication that would closely model the effectiveness of face-to-face meetings.

Uganda

In June 2011, the team of seven set off to Uganda to connect with their local Makerere University teammates and embark on their field implementation. Some of the team would spend 5 weeks in Uganda and other team members, including Irena, would stay through August.

The team would now focus on further refining the Elephant Tap, the water transportation device, the remote monitoring system, as well as run workshops for certain parts of the first level of the Clean School concept. This level would consist of making soap and soap packaging, painting latrines and benchmarking latrines at other schools, and establishing

the home base for Clean School. For the PDP prototypes, the main idea would be to develop an implementation guide for the WASH-prototypes and Clean School concept. In order to do so, the team needed to figure out various factors including how to localize the production of the prototypes and map out both the procurement of supplies as well as the local labor force needed for production.

In order for the team to start getting their hands dirty, first they had to set up a workspace for themselves and luckily there was a suitable place for this at the UNICEF Innovation Center in the area of Mbuya in Kampala – an area separate from the UNICEF Uganda office. This was an ideal work base for the team while in Kampala, as it was a facility equipped with the right tools and personnel to allow for further prototyping. At the Innovation Center the team was also lucky enough to meet Felix, an engineering student of another local university – Kyambogo University – as well as an intern at the Innovation Center. Felix’s passion and capabilities quickly welcomed him as a new team member to the Summer Implementation project!

During those first few weeks in Kampala, daily visits to the Innovation Center, scheduling meetings with relevant stakeholders, and procuring items that might not be available to the team in Gulu, was in order. By this time the team had already split themselves into sub-teams in order to work with each of the specific solutions. While some were installing test monitoring devices into latrines in order to collect data in real-time, others were testing recipes for making soap from scratch, all within the Innovation Center.

The team met several times with staff at UNICEF Uganda’s country office in order to go over UNICEF’s codes of conduct and learn about how UNICEF typically engages in the implementation process. It was also to make sure that the planned work was in line with what UNICEF does, in order to ensure adoption and continuation support from UNICEF. One of those meetings brought together the whole Summer Implementation team along with about nine different representatives from UNICEF Uganda. During this meeting they confirmed the main goals of the Summer Implementation project. UNICEF expressed that the implementation guide for each product should include all of the critical stakeholders involved along the production and distribution path starting from UNICEF

and ending with the child. It was discussed that the students should consider how to local manufacturers and government as well.

The time came to advance to Gulu and after a 5-hour, very bumpy taxi ride, the team arrived and set up their home and office for the following two weeks at a local hotel in central Gulu.

Once the working space was set up, and lightheartedly named Gulu Design Factory, the team began setting up a concrete schedule for their time there and arranging meetings with the local UNICEF field office in Gulu. Meeting with this field office was especially important in order to give them an overview of what the team hoped to achieve while there and allow for UNICEF Gulu to understand how they could best help the team's progress with their work and further map out the extent of our operations related to the implementation process with them. With UNICEF, the team mapped out suitable schools, organizations, and local officials in the village that the team would first visit and proceed to invite to take part in their implementation process. The team arrived at a concrete plan with UNICEF and UNICEF gave their 'OK' for the team to proceed.

In order to engage schools and other relevant stakeholders into the process while educating and further developing and implementing certain elements of Clean School along with PDP's accompanying prototypes, the team decided that they would carry out workshops, competitions, and events. Based on the mapping carried out with UNICEF, the team was able to pinpoint "role model" schools, which exhibited a suitable location, infrastructure, and willingness to take part in the implementation process. After pinpointing these schools, the team went around to each school with a UNICEF representative in order to make initial introductions and share the plans of the project. The hope was to meet certain staff and students from the select schools that could become involved in the process. Along with having a UNICEF representative with the team, it was also incredibly helpful to have Ugandans on the team, one of whom was even originally from the Gulu region.

During the entire course of the work, the team wanted to carry on with the mentality of, 'We are guests in your home.' It was imperative for the team to uphold a high level of

respect and professionalism in their work, despite events that might summon emotions, which not only meant working in a considerate and ethical manner but also abiding by the codes of conduct established by both Aalto University and UNICEF. The partnership-seeking process as well as the procurement process especially required a responsible mindset and constant consideration of long-term effects by the team in order to abide by UNICEF's strict policies on procurement and partnerships. In doing so, with the time that they had, the team made it a necessity to locate compatible proprietors with relevant capacity. When the team was obtaining supplies for use in further development and installation of their prototypes, along with the supplies needed to carry out the workshops, the team also made sure to locate and procure these items at a competitive price.

One of the initial workshops carried out, in order to involve the youth more in this process, was a tap design and manufacturing workshop held at a local vocational institute in Gulu named Daniel Comboni Vocational Institute (DCVI). Not only was this workshop a success, but after the workshop the team found this institute not only exhibited great interest in being involved in the production of these taps but it also possessed the most well-equipped facilities for an academic institution in Gulu. Therefore, it was arranged that further development and testing was to be additionally carried out through DCVI in order to create feeling of ownership of the tap in the institution, as it would potentially become a future manufacturer of both the Elephant Tap and water transportation product. Unfortunately, the supplies and parts needed for the tap specifically were not as easy to come by. Although some parts could be found in Gulu, many of the parts still had to be purchased from industrial markets in Kampala.

The following will provide a description of each of the concepts and/or prototypes from when they were first conceptualized during the 2011-2012 IDBM and PDP projects to when the Summer Implementation team was working on implementing, and how they were further tested and developed. The Elephant Tap will be explained in most detail, as it will be the focus of later assessment.

The Water Transportation Device

The Water Transportation unit was one of the final prototype designs from the PDP project team.

The idea came for a Water Transportation device as the original PDP team realized that many children, especially girls, were wasting valuable time and energy each day purely on transporting water both at home and at school. This conflicted with study time during school hours as well as having the time to partake in other extracurricular activities. Not only that, but external research proved that transporting water in the manner which they did also proved to have negative health effects on children.

During the Summer Implementation project, the plan specifically for the Water Transportation device was to further develop the existing prototype by carrying out user testing. The team also needed to set up a plan to have the unit manufactured locally. Once these were achieved, the team would establish a business model for the unit and produce a plan for potential mass production.

There was a 3-day creative competition set up for some of the school students to improve the design of the water transportation device. After testing and getting feedback on different prototypes from the children, the team decided upon the final prototype. It would have two functions: one providing the possibility to carry standard 10 and 20 liter jerry cans – plastic jugs used to carry water – and the other to be used as a trolley or backpack to transport the water depending on the weather and road conditions. If not carrying water, the school children could use the transportation device as a carrier for their school items. The handle of the product could be folded back to form a chair, which children could use to sit on in class. As this prototype only consisted of five parts, it was simple to produce and maintain. The final design also could be manufactured locally, with the frames for the carrier made in Gulu, at DCVI, and the material for the backpack could be manufactured in Kampala.

The Monitoring System

As typically it is time consuming to collect data from the field, obtaining sufficient information in a timely manner from remote locations is often quite challenging. Currently, a majority of the information collected by health inspectors is acquired through the head teachers of the schools. However, this information obtained from head teachers is not always accurate as the truth can be stretched fairly often in order to skew the results and obtain more aid money for the school. It also happens quite often that certain schools officials might paint the WASH picture out to be of higher quality than it actually is. Obtaining and processing the collected information, no matter how true or false it is, can take a fair amount of time. Therefore, the PDP team questioned, how could they create a system that collects and sends data in real-time, to quickly receive reliable information about WASH in schools? Thus, the monitoring system was created.

The PDP team wanted to incorporate monitoring units into schools that would utilize sensors for data collection. The data would be sent via SMS to appropriate receivers and to a database to collect the data over time. This would function in a way similar to systems that UNICEF already uses: mTrac, Ureport, and EduTrac. The benefit of collecting data and visualizing it over time would allow for Ugandan Village Health Teams (VHTs) and governmental organizations to be informed of where and potentially even why the largest problems in WASH are occurring and thus distribute aid money where it is most needed.

In Uganda, the Summer Implementation team first procured and tested the technology in partnership with a local social enterprise distributing solar lighting and charging technology, Barefoot Power, at the UNICEF Innovation Center in Kampala. Although most of the technology for the unit was local, there were parts of the unit, which were imported from Finland, such as an ultrasonic sensor to collect data on water levels at the schools. In order to abide by UNICEF's wishes the team continued to work on developing the unit so that it could be fully manufactured locally, at an inexpensive cost. When finally meeting with UNICEF Uganda staff to share progress on the Monitoring Unit, they came to the conclusion that it was similar to UNICEF's Edu-trac. Therefore, it was unanimously decided that the Monitoring Unit could be integrated into Edu-trac. For

this reason, from that point onwards, the Monitoring Unit would be referred to as Toilet-trac.

After perfecting Toilet-trac in Kampala, the team brought the technology up to Gulu in order to be installed in select schools there. Upon initial installation, local Barefoot Power technicians were involved in order to establish local know-how and a certain level of ownership by a local organization in addition to the school where it was being installed.

A unique feature of the Toilet-trac was since the Barefoot Power school kit was involved, it not only allowed for a sensor system for data collection but also provided solar-powered lighting to certain areas of the school where it was typically darker. This was especially vital in the toilets themselves, as it created a safer environment for the children.

During the following two months, from July into August 2012, after the rest of the team had already left back to Finland, a couple of the team members had stayed in Uganda and visited Gulu for a second time. At this point, the installation of Toilet-trac accompanied by the solar lighting kits was completed at two of the schools in Gulu.

Toilet-trac was later named 'San-Trac' by the UNICEF Uganda Country Representative in 2013. Although San-Trac was in the prototyping stage and will not be further developed in the near future, the UNICEF Innovation Center ensured that all work related to San-Trac was fully documented for further potential utilization in the future. San-Trac also went on to win a people's choice award at a sanitation hackathon in Uganda.

Clean School

Clean School is a concept initially designed by the original IDBM project team. It is aimed at driving improvements in WASH through an assortment of both tangible and intangible touch points at schools which are driven towards quality hygienic practices through peer evaluation of facilities and a rewards system. Ultimately the purpose of Clean School was to heighten the level of hygiene at schools by both educating and motivating all who are involved, ultimately to establish good hygiene as a standard in

schools. The concept was designed in a way that allows students and staff to associate proper hygiene with a feeling of achievement and fulfillment.

The workshops which the Summer Implementation team chose to carry out in order to kick off the first stages of Clean School were: soap making and packaging, latrine painting, and sanitation benchmarking. It was decided that there would be one pilot school – Mary Immaculate Primary School – where the initial stages of Clean School would be tested and carried out. Although workshops were held at Mary Immaculate, students from the other selected and visited schools were handpicked and brought to each of the workshops that took place.

Once all students were selected, now was the time to let the workshops begin! In the soap-making workshop, students were taught how to make soap from start until finish using all local, inexpensive materials. Once the soap was created, on a different day students and staff were intermingled into teams and another workshop was organized to create soap packaging from any material found around the school grounds. The purpose was to not only encourage creativity but also to consider how easy it would be to produce and package soap to sell. By teaching pupils how to make the soap themselves, the team hoped that this could ultimately encourage them to produce more soap as well as use it, since they would have ownership over it.

For another workshop, named sanitation benchmarking, students from Mary Immaculate Primary School were first asked to produce a list of 10 points regarding what makes a latrine hygienic. After they made these lists, they were brought over to a neighboring school to act as inspectors and visit the latrines at this school to evaluate how hygienic the latrines were, using their criteria for evaluation. This workshop allowed for students to clarify what truly is important in good hygiene and by role-playing the job of a health inspector, it provided them with a more authoritative approach over the issue.

Over the course of a few days, the summer implementation team additionally carried out a latrine painting workshop which had the idea of communicating messages about proper hygiene through artwork – and where else better to do it than straight at the source of probably the least hygienic area of the school. The summer implementation team along

with the gathered students and staff first cleaned one of the chosen sets of grey, concrete latrines and then proceeded to paint it in beautiful, vivid colors. The students had the possibility to choose which images to paint on there that would most resemble good hygiene. Then going into the future, these images would act as a constant reminder to students to not only practice good hygiene but also what constitutes being hygienic.

The later, more advanced stages of Clean School were yet to be implemented, as it is a process that occurs over years of time. Before this concept could be replicated and spread to other areas, the concept would need to be proven to work in the local context. Once that would occur, the plan would then be to further formalize and test how it could be spread and implemented nation-wide. A specific material kit would also need to be established as a standard kit that would assist in starting up Clean School in other schools nationally or internationally. With this information in mind, it was clear that there was still much to develop and decide upon in the larger scope of the concept.

The summer team found it necessary to identify a home base for Clean School. While in Gulu, the team discovered a very unique, privately owned open arts center called TAKS, which stood for Through Art Keep Smiling. This was a center that promoted doing, being active, and creating all in a safe environment. After meeting with the extremely lively and passionate director of the center and spending a few days exploring the premises, it was mutually decided that this would be the home base for Clean School. Having a home base meant that different members of Clean School from around Gulu, would have a central location to meet and communicate with each other about improvements in local WASH practices. Also, since there were computers and internet available at the premises, it would allow members from the Clean School community to contact representatives from the project team in Finland if they wished to.

Once the TAKS Center was established as Clean School's home base, it was decided that there would be two important events held there. One would be a meeting at the Center to bring together all local stakeholders who had been involved from UNICEF Gulu's field office, academia, community leaders, and other organization representatives. The meeting functioned as both an open debate as well as a workshop to establish the network that would meet on a regular basis to coordinate and continue to develop Clean School

activities around Gulu. Attendees were asked to share their opinions on how Clean School could continue in a way that would drive their desire to expand the community and prove valuable enough for others to want to join. It was ultimately decided that the network would continue as a rather flat organization and build a co-creation environment where members could act as a group of peers exchanging news and ideas freely in a creative environment.

The second TAKS event was the closing of the Summer Implementation project, where students and staff were brought together from all of the involved schools for a full day consisting of presentations, food, games, and challenges as well with a focus on community and team building. At this event, one of the Elephant Taps installed at the TAKS center, the other one being installed at another primary school, was unveiled. These taps had been installed at two locations in order to test the newest prototype of the taps over a 3-week time period. The bodies of these Taps had been sand-casted in Gulu and attached to water tanks by the DCVI staff and students.

In the final days in Gulu, before the summer implementation team would gather up their belongings and make the trek back down to Kampala, a formal press conference was held with UNICEF Gulu field office representatives at Mary Immaculate Primary School, being the pilot school of the Clean School concept. This was set up in order to help spread the news of the foundation set up to promote proper WASH practices in local schools. The conference was headed by UNICEF's regional representative and attended by additional UNICEF Gulu staff, the summer implementation team, local office leaders, and local media. The outcomes and further developed prototypes were unveiled to the attendees and the staff and students of Mary Immaculate, who were also present at the conference, expressed their dedication to continue proper WASH-related activities at their school.

The Elephant Tap

After thorough research in and outside of the field, the initial IDBM and PDP teams realized that nearly every issue that arose in relation to the safety of children or their

education was connected to problems in WASH. The PDP team discovered that most of the problems in WASH were somehow related to problems with taps. As mentioned earlier, taps were either not present, broken, stolen, etc. The numerous problem related to taps lead to the fact that it was difficult to establish hand washing as a habit amongst school children.

Knowledge of the importance of hand washing was also limited. Even though the school children appeared to have a great grasp on the subject of good hygiene and hand washing specifically, as they could sing songs and recite poems about washing hands, when asked to actually explain the importance of good hygiene, there answers merely repeated the lyrics of the songs. It was clear that they did not fully understand the subject at hand.

With all of this in mind, after their initial field research trip to Gulu in late 2011, the PDP team decided to proceed with designing a robust tap specifically for hand-washing in schools, that would be easy to use and difficult to break and/or steal. They wanted to build a tap that was both strong and easy to maintain, so if broken it could be cared for quickly and effortlessly. The tap was designed in a way that would regulate both the amount of water used and time it would take to wash one's own hands. The water would come out with a steady stream for the time period of approximately 30 seconds – which is the amount of time that someone should wash their hands with soap in order to have them properly cleaned. This in turn would either consciously or subconsciously teach children the proper amount of time they needed to spend in washing their hands. The team estimated that this function also helped save water by nearly 95%. Another special quality of the tap was that the user would only need to press the lever once in order to get the water running and then it would shut off automatically; they would not need to press it again due to a self-lock mechanism, therefore preventing them from re-contaminating their hands.

Undoubtedly, there were great plans to continue further development of the Elephant Tap. One main purpose of the Summer Implementation project was to determine whether or not it would be possible to manufacture the Elephant Tap in Uganda at a competitive price, and if so, then pinpoint potential partners and manufacturers for the entire process. Despite the whole team only being in Uganda for 5-weeks, out of the 3-months that Irena

would spend there with the local Uganda teammates, the goal was to first install the taps that had been pre-made in Finland, so the team could obtain user feedback to use towards developing the product further. From previous user testing carried out in February 2012 in Finland and Uganda, the PDP team came to realize that the tap had leaking problems after one month of use. Therefore, the team also had the goal of finding a solution to the leakage over the summer months. Ultimately, once the final product design would emerge, the team planned to establish a business model along with an implementation guide from UNICEF to the school children.

While first in Kampala, huge efforts were put into testing and perfecting the tap's functionality at UNICEF's Innovation Lab. In initial meetings at UNICEF's head office in Kampala, the tap was especially perceived to have the potential to be produced by local SMEs as the skillsets required to manufacture it were already present in Uganda. UNICEF Uganda had strong belief that the tap already exhibited all of the necessary characteristics in order to be established as a WASH innovation and become a mass-produced commodity in Uganda once final product development and user and technical testing at the schools was completed.

In June 2012, once the team traveled to Gulu, and visited DCVI, the team decided to put further efforts into developing and testing the tap with the students at DCVI. The team decided the best way to kick off further product development with the DCVI students, was to hold a short product develop workshop with the students to explore further possibilities. The workshop was then held specifically with DCVI mechanical engineering students and their teachers. As the DCVI students were all locals of Gulu, this was a great opportunity to gain local perspective towards the design. The group arrived at three potential ideas to follow through with. One idea was a tap for hand washing in primary schools, the second was a tap for hand-washing with a built-in, automatic soap dispenser, and the third was a tap designed specifically for rainwater tanks with a faster flow-rate of water.

To the team's surprise, many new ideas emerged from the solutions. These new ideas could surely be incorporated into the final design of the tap. Two out of the three initial ideas even turned out to be very well developed. Based on the success of the workshop as

well as the enthusiasm of the students and teachers to be involved, ideas emerged for a potential long-term commitment of DCVI to be involved as a future supplier of the tap. Although a great idea, it would naturally be up to UNICEF to make the final judgment call on this idea.

In order to pinpoint from where materials for the tap could be procured, the team set out to explore and discover a group of local manufacturers who had the proper skillset to cast the taps in aluminum. Once these manufacturers were identified, it was then possible to cast two new taps, which could be installed and tested in Gulu. DCVI and the team, along with invited guests from the District Water Office and UNICEF Gulu, worked hand in hand to mount these taps on to two randomly chosen tanks, which could hold ample amounts of water for hand-washing.

One tap would be installed at the TAKS Center, home base of Clean School, and the other at a select primary school – Layibi P7 – whose students named the tap ‘Elephant Tap’, as the tap itself closely resembled an elephant, which is the sign of their local Acholi tribe. The tap installed at the TAKS Center would be open to the public for use and have a notebook alongside it for users to leave comments based on their experience in using the tap. This tap however would later be moved in late September 2012 to Kampala for UNICEF’s use. The tap specifically implemented at Layibi P7, would stay there to be monitored by DCVI in order to catch any problems that may require fixing.

After mapping out all of the components needed for the tap, the team estimated the price of the tap to amount to approximately 29,500 Ugandan Shillings (UGX), which would be equivalent to about 10 Euros. Although it does not seem like much at first, comparing this price to other taps available on the market allowed the team to realize that they needed to figure out ways to reduce the tap’s cost for the market, as the other taps ranged in price from 15,000 – 20,000 UGX. The team believed that if the taps were to be mass-produced it would allow the price to decrease. However, this was just a theory and not backed up by evidence yet.

In July 2012, three weeks after the Elephant Taps had been installed at TAKS Center and the primary school, Irena along with Felix and one other Aalto teammate traveled back to

Gulu to examine the condition of the taps. Once in Gulu, they went to retrieve and dismantle the taps for further analysis. Unfortunately, it was clear from the start that the inner components of the tap had all begun to rust.

The Elephant Taps and the team then traveled back to Kampala to continue further development and testing of the taps from July into August 2012. In trying to find stainless steel components for the tap to prevent rusting, the team found that since stainless steel is not a major commodity in Uganda and therefore quite expensive, it would not be suitable to use in the manufacturing of the tap. Thus, the team had to decide to use steel, which could be galvanized by a local company in Kampala. In trying to locate certain material like springs for the tap, the team encountered various levels of difficulty, as these materials were not available in Uganda or neighboring countries. Not expecting such complications, the team began to question whether this would have an impact on the business model for localized production, if components would need to be ordered from other countries. They also considered that necessary parts weren't available in Uganda naturally due to lack of demand, so in turn if the taps would be mass manufactured in Uganda, it could attract the import of critical components such as the springs. Or alternatively, it could open up new business opportunities for small, local businesses. In attempts to also test different materials for a new mold for the tap, after a first failed attempt with using wood, the team then tried an unused sand-casting method in the manufacturing process. After this, using hand tools at the UNICEF Innovation Center, the taps were machined with unsuccessful, poor accuracy leading the team to bring the taps to a workshop to have them machined once again with a professional, lathe machine.

Throughout the whole course of the summer implementation of the tap in specific, there was a great effort put in place to use methods and technologies that could be replicated by both small local producers and larger industrial manufacturers. It was also made an imperative to locate local materials to be used for the manufacturing process. During the summer months the tap was re-designed various times and tested in both Kampala and Gulu and in both cities, the team visited various markets in order to try to locate necessary materials and skillset to manufacture the taps. Even if suitable materials were found at these markets, it was not reliable to pinpoint any of them as steady suppliers due

to the fact that the markets sold a variety of used or scrap material. This signified that there wouldn't be a consistent supply of a certain material at any given time. Based on all of these troubles, it was highly recommended by the teams that future manufacturing chain requirements be constructed from the start around materials that are plentifully available locally.

At the end of Summer 2012, team members from the implementation team began establishing both small and large-scale business models for the Elephant Tap. At this point plans in working with DCVI were continuing and the Elephant Tap was closely reaching the point where it would be ready for larger-scale manufacturing. It was also determined that although UNICEF Finland had the intellectual property rights of the tap, they planned on making it an open source model. It still needed to be determined though what roles a manufacturer and distributor would play in regards to producing and supplying the new UNICEF WASH product in collaboration with UNICEF Uganda. As the user and manufacturing guides had not been created yet, this was yet another task to be carried out by the team members. Therefore, the business model for the tap was still to be discussed between UNICEF Finland and UNICEF Uganda.

The plan was that after the Summer Implementation project, at the start of the 2012-2013 academic year, a new IDBM team would continue the work carried out over the summer months and focus on the scalability of the Clean School concept as well as its accompanying (PDP) products. The future IDBM team would be tasked with figuring out a way to further develop and improve the concept in a more effective way so that it could be implemented both city- and ultimately countrywide.

Chapter 4: The Evaluation

(September 2012 – May 2013)

Finland

September 2012 kicked off a new academic year and a new Memorandum of Understanding (MOU) was signed between UNICEF Finland and Aalto University's

International Design Business Management program. It was agreed that the supportive partner for the multidisciplinary research to be carried out by the students would be Aalto Global Impact. The new year also brought along a new UNICEF Finland representative, Annika, who would be the industry client main contact for the UNICEF Aalto collaboration. She would also be working as the Head of International Advocacy of UNICEF Finland.

This year's project would have the overall goal of contributing to the promotion of hygienic school environments in Uganda. In doing so it would entail the students evaluating the work that had been carried out thus far. More specifically this meant evaluating both the solutions that were implemented by the Summer Implementation team along with those non-implemented solutions as well. The purpose of this would be to pinpoint which solution proved to have most potential going forward so the team could then work towards developing a plan for the solution to be scaled up nationwide.

Meanwhile in Uganda, continuing onward from the work of the Summer Implementation project, DCVI along with one of the members from the Summer Implementation – Felix – continued to work on further developing the Elephant Tap and producing additional prototypes. As DCVI was aware that the tap had issues with rusting and heavy weight as well as the water-flow time decreasing to under 20 seconds due to the quality of the springs, they were focusing their time on eradicating these problems. As Uganda is not rich in infrastructure to locally produce and manufacture in general, UNICEF began questioning whether there would be a possibility to enhance the capacity of Ugandan companies to take part in this process to manufacture items such as this spring. Unfortunately, the reality was that most manufacturing processes in general took place in Uganda's neighboring country, Nairobi, Kenya.

Back in Finland, in order to attempt to acquire the accumulated knowledge from the two years of the collaboration thus far, the new IDBM project team mapped out all stakeholders and chose to specifically interview members from the teams that had taken part so far – from the 2011-2012 PDP and IDBM teams as well as the Summer Implementation team. They also put great effort into researching the Ugandan environment and impact evaluation tools, which they could utilize when evaluating the

implemented concepts.

After great efforts were put into understanding the playing field, it was this team's time to make their first trip to Uganda in order to collect data on the implemented concepts and discover Uganda first-hand.

Uganda

Once in Uganda, unlike other teams who first spent their time in Kampala meeting personnel from UNICEF Uganda and prototyping at the UNICEF Innovation Center, this IDBM team rolled up their sleeves and went straight to the field in Gulu. There they planned on carrying out interactive workshops along with individual and group interviews both with current stakeholders as well with experts in the field. One major group interview to be held with the personnel from UNICEF Gulu was unfortunately cancelled as UNICEF had many projects and issues to focus on simultaneously. This caused for important questions the team had to be left unanswered.

Although their group meeting with UNICEF Gulu did not manage to occur, they fortunately still had the chance to meet with some staff in order to both share a progress update as well as interview them in order to obtain crucial knowledge towards their progress. One interesting fact that the students learned was that when implementing WASH-related concepts in schools there are certain district offices that should be involved along this process. These 3 district offices are the district water, health, and education offices. To their surprise, the team came to find that only the district water office had thorough knowledge about the various concepts that had been tested and implemented over the previous summer months.

While in Gulu the team also quickly discovered that it was difficult to use their initial researched evaluation tools in the context of their work because although there had been a number of concepts tested with users, most of these concepts were still being developed and all were not fully implemented. Therefore, in order to properly evaluate the concepts at various stages of development, they decided to use different tools depending on their

level of completion. In other words, instead of measuring the impact of a concept, they used other evaluation methods including outcome evaluation and process evaluation. In the evaluation process, the team put greatest focus on considering whether each concept was sustainable and if it had the potential to be adapted by communities and scaled up nationwide.

As the team had planned, during their trip to Gulu they collected information separately for each of the implemented concepts. They came to find that other than the Elephant Tap, all of the other concepts had either been incompletely implemented or were not necessarily implemented at all. Although each of these concepts had been accepted by the stakeholders and the community while the Summer Implementation team was there to introduce them into the community, once the team left, any further development of the concepts was minimal, even in the case of the Elephant Tap. The Water Transportation device had been minimally developed further but no schools had it in use and Toilet-trac was not being utilized much either. In evaluating the Clean School concept in specific, the team came to find that it had only partially been implemented since only its Stage 1 was carried out over the summer months. They also discovered that despite strong beliefs that the TAKS Center would act as an ideal location for the home of Clean School, the local Clean School network proved otherwise. Some of the teachers of the schools, which had been involved in the Clean School activities, expressed their displeasure in this decision made by the Summer Implementation team. This was predominately due to the fact that even though the TAKS Center was located centrally, the teachers still found it to be too far from their schools which therefore limited their possibilities to visit the center unless they would use their own money to pay for transportation as the schools would not cover such costs. It was also a surprise for the team to discover that even though soap-making activities continued, especially at Mary Immaculate Primary School, they were so proud of the soap that they had made that they had locked the soap up into a room and weren't using it at all! It was clear to the team and to other stakeholders involved, that locals still viewed the Aalto-UNICEF team as the owners of the concepts and they lacked clear ownership of persons who would drive them forward and ultimately manage their development to be scaled up further.

At this point the Elephant Tap had proven to have been developed and tested the furthest, considering that several prototypes had been made in Kampala at the UNICEF Innovation Center and thorough testing had been carried out by DCVI in Gulu in order to further improve the tap. In Gulu, the team collected feedback and information from both DCVI and Layibi P7 Primary school, where one of the taps had been located already for 4 months. From this feedback, the team was able to extract certain technical issues of the tap and made sure to report these directly to UNICEF.

Once their time in Gulu came to a close, the IDBM team headed down to Kampala to continue with their work there. They especially wanted to focus their time in meeting with UNICEF Uganda, to figure out what had gone wrong and what could now be done to help drive certain concepts forward. As UNICEF Uganda is made up of different units, including the Technology for Development team and the WASH team, the IDBM team deemed it necessary to discuss with each of these teams, and what they found out was quite surprising. Each of the units were eager to discuss further development of the Elephant Tap, disregarding the other solutions as well as opposing their initial preferences in focusing on further development of the Water Transportation device. The head of UNICEF Uganda wanted to push the development of the tap as well as continue educating the youth on how to make soap – one of the workshops carried out for the Clean School concept. The Head also shared that UNICEF did not follow any specific product development model at the time; once a good idea came along, they simply followed through with developing it based on how they saw it best fit.

In Kampala, in the beginning of November 2012, Mikko – Head of the IDBM program – and Annika had also traveled to Uganda to meet with the head of UNICEF Uganda along with other UNICEF Uganda staff to discuss the future of the collaboration. UNICEF expressed their interest in having this type of partnership continue as long as they could achieve a win-win situation amongst the parties involved. In the following days, they also met with the Vice Chancellor of Makerere University and carried out a partnership exploration meeting at Makerere University's School of Fine Arts where professors, heads of department, and the dean were present from Makerere's side, along with representatives from UNICEF Finland, UNICEF Uganda, and Aalto University.

At this point of the development, based on the fact that the tap had proven to be most favored and viable according to the points of evaluation – sustainability, adaptability, and scalability – made by the IDBM team, it was decided that further support for development would be focused on the Elephant Tap. This would also include a new proposition for how the Elephant Tap could be produced.

Finland

Back in Finland, the IDBM team presented their findings from their field research trip to UNICEF Finland. After a lengthy meeting with UNICEF and sharing news of their discoveries in Uganda, the team and UNICEF Finland mutually agreed to continue in the direction of creating a product development roadmap for UNICEF, which would function for both the Elephant Tap and future product development for UNICEF. By creating a general roadmap while using the Elephant Tap as a case example, it would allow the team to locate if and where there were gaps in the product development of the tap and how it could be developed further. Although the case study would be carried out on the Elephant Tap, the final roadmap would be a generic model and thus could be additionally used on further developing the Clean School concept as well as the other prototypes created thus far in the collaboration.

Once this decision was made, the team began to research different models for new product development and shifted their focus predominately to the Elephant Tap. It was challenging for the team as they now needed to dive deeper into the world of UNICEF in order to gain a more thorough understanding of how UNICEF works. This was done in order for them to be able to grasp which new product development model would tie in best with the way that UNICEF currently functions. What they came to find is that they would need to merge existing models to create a customized product development model for UNICEF.

Uganda

After a few months, it was once again time for the team to embark on a second 2-week trip to Uganda to test whether they were heading down the right path in terms of constructing a relevant new product development model for UNICEF and continuing research into further development of the tap.

During this trip, the IDBM team dove deeper to try to understand how Uganda's private sector functions both in Kampala and in Gulu. They came to find that there are only few actual producers in Uganda as most of private sector consists of vendors and distributors. The business sector is also highly regulated by the Ugandan government, making it challenging for existing companies to develop their long-term strategies. They came to find that surprisingly many of the industries in Uganda were run by Indians and many of the raw materials being imported to Uganda came from either India or China.

While carrying out interviews with various relevant individuals, the topic of ownership arose over and over again. One interview, specifically with the Uganda Water and Sanitation NGO Network (UWASNET) stressed the importance of placing initial focus on a model that would encourage both local ownership and the ability to maintain it locally. Now there were two important factors to surely be included into the product development plan of the tap in order for it to function well in schools over a long period of time – ownership and capacity to repair. If there would be local capacity to repair the Elephant Tap, the team believed that it wouldn't make much of a difference whether it was decided to have the tap mass or locally produced. But how would schools achieve the aspect of ownership? One suggestion was that instead of an NGO providing a solution to a school, the school should instead pay some money for it so a mentality of ownership could be achieved.

As UNICEF Uganda was so thrilled about the tap, it was planned for the tap to be mass-produced, starting off at around 1,000-1,500 taps. Contrary to what the Summer Implementation team believed regarding having the tap produced by small, local entities like DCVI, UNICEF Uganda believed that it would be wise to involve private sector instead and produce the taps through them, as they would then have the responsibility of

distribution and repairing the taps in case of any future problems. However, one important issue that the team pointed out for UNICEF to take into consideration, was the fact the since the information about the manufacturing tap was to be open source, UNICEF should make an agreement with one specific private manufacturer who would be predominately responsible for eradicating any problems that may arise with the tap.

Finland

In turn, the IDBM team produced a 9-step innovation toolkit for UNICEF, which UNICEF could use in carrying out product development going into the future. According to the UNICEF Innovation Toolkit, the steps for product development went as follows: Step one, select a need; Step two, idea generation; Step three, idea screening; Step four, concept generation; Step five, concept selection; Step six, concept development and testing; Step seven, business analysis; Step eight, piloting; and Step nine, implementation.

Only a handful of Elephant Tap prototypes were produced thus far through the Aalto-UNICEF collaboration. In tying in the case study of the Elephant Tap, they came to find that the tap itself was only in stage 4 – concept generation – out of 9 in the innovation process. The team then estimated that in order to fully complete the steps and finalize the implementation of the tap, it would only take about one more year. Although UNICEF was becoming anxious about producing the tap, the team wanted to question whether there really was a need for it? If so, what specific need was it that the tap addressed? Even though much effort had already been put into the tap in order to figure out ways in which to produce and distribute in locally, it still couldn't be confirmed how schools would in fact develop a mentality of ownership over the tap, ultimately questioning whether the tap was sustainable or not.

One thing was for sure though, as UNICEF still didn't specialize in product development or in processes of manufacturing and distribution, these would be activities that should be outsourced. Despite all of the effort put into figuring out a method to mass-produce the tap, according to the innovation toolkit it still needed to be further developed technically and it also lacked concrete proof of maintaining a higher quality than other existing taps

on the market. On the other hand, if the tap could prove that it does in fact improve hygiene in schools while functioning consistently well over a long period of time, that would give solid grounds for following through with the production process. Further issues that would be crucial to confirm though would be whether the tap could be locally repaired and how would the schools proclaim ownership over the taps?

Chapter 5: Localization and Beyond

(September 2013 – May 2014)

Finland

As UNICEF Finland had lacked a methodology for new product development, the previous IDBM team suggested a model of new product development to them in order to provide a good foundation to arrive at commercially viable, sustainable offerings. Now, September 2013 marked the start of a new school year and a new set of tasks for the 2013-2014 IDBM students. Their task would be to develop a methodology for localized product development. The purpose behind this would be to ensure the sustainability and specifically the scalability of products developed and long-term benefits for the local community. In other words, the new team would be working off of the product development model that the 2012-2013 IDBM students had created for UNICEF and further develop it to become adequate for developing localized solutions, which in this case meant for the Ugandan context. UNICEF Finland made sure to highlight the importance for this year's team to follow along with the principles of the Convention on the Rights of the Child, an international human rights treaty, in order to abide by the UN mandate to support the rights of children.

In addition to establishing a localized product development methodology, the team was also requested to explore the possibility of involving private sector directly into the partnership with UNICEF and academia. During the course of this team's upcoming academic year, UNICEF would be considering Biolan, a Finnish manufacturer and

distributor of environmental products amongst other related products, as a potential partner. The reason for potentially involving Biolan was not only due to Biolan's general interest to be involved but also because there was great potential for Biolan in the Ugandan WASH sector. Biolan had initially shown interest in donating some of their latrines for the Summer Implementation project to introduce to the local Ugandan community but unfortunately there had been difficulties in arranging for the shipping of those latrines. Another reason for involving Biolan was to see if involving private sector would diminish the ongoing problems that UNICEF has with communities relying on their free giveaways, which ultimately counteracts the efforts put in to empowering locals in the field. UNICEF believes that in order to forgo these dependencies they need to establish successful partnerships with private sector. However, a for-profit partnering with a non-profit could certainly cause challenges. Therefore, the other task given to the IDBM team was to explore opportunities for Biolan in Uganda and as a member of the collaboration.

The IDBM team utilized their first few months of the project to carry out broad research, as the other teams did, to understand their playing field and uncover critical information to keep in mind when developing their concepts. While still in Finland, they took the opportunity to explore existing successful business models in the Ugandan context and carry out thorough interviews with key persons to discover what is important in this type of collaboration as well as in working in the context of a country like Uganda. One of these people they interviewed was naturally Annika, UNICEF Finland's main contact person for the collaboration. Annika explained to the team the importance of establishing both the capacity of each partner when collaborating as well as a common means of communication and understanding. UNICEF is interested in partnering with external bodies in order to break away from their traditional means of providing giveaways to local communities, as it is not sustainable, and by doing so and establishing new partnerships, it opens up new opportunities for innovation. When UNICEF is partnering with external bodies, it is important for these groups/businesses/etc. to understand the rules of the context in which they are working, which means the need to be physically present in the context and carry out relevant research in order to gain a thorough understanding of it. Being present in the context allows members to discover what needs

truly exist locally, which gives them a concrete goal of what to work towards developing a solution for. It also allows for members to gain an understanding of the local business environment, before establishing their own business there. Furthermore, it allows for people to not only get a sense for the local language but also the use of the English language as some English words are used in different ways and may leave room for misinterpretation. People managing the work should already have a degree of experience in the local context and business environment so once a product is being developed, they have already found a way to educate the local community about the offering instead of simply throwing it at them.

Uganda

For their first trip to Uganda, the team aimed at getting to know the environment in which they are working, including the Ugandan culture and business environment, as well as become better acquainted with UNICEF Uganda as well as Makerere University. Unlike the previous years' teams, this IDBM team did not plan on traveling up to Gulu but would instead spend their time predominately in Kampala. The only trip they would make outside of Kampala was up to an area of Uganda called Jinja, where they would shortly go with UNICEF to gain a better grasp of what conditions are like on the field.

In Kampala, the team had great plans to meet with a plethora of people in order to help them network and evaluate current assumptions they had. In addition to meeting with Makerere University representatives, staff from UNICEF Uganda as well as UNICEF Innovation Center, they also met with local artists, entrepreneurs, social workers, and the Honorary Consul of Finland, himself, who had strong knowledge and experience with starting businesses in Uganda. Out of these meetings, the team was able to extract very useful information towards their progress.

In addition to what other teams had discovered over the years, based on their interviews this year's IDBM team realized Uganda has a variety of cultures and languages both locally and from many foreigners, especially Asians, moving to Uganda, and there are many different tribes throughout the nation as well. Each of these tribes has personal

traditions, practices, and superstitions that are important to take into consideration when implementing in certain regions of Uganda. One highly important fact to remember is in tribes as well as in business, schools, etc. in Uganda, there will typically be someone who acts as the leader or gatekeeper. Before starting anything, it is best to locate this gatekeeper and involve them from the beginning. It's not necessarily difficult to locate these gatekeepers, but what would help is to first establish even a small network of local people who you can trust. Once you meet people in Uganda who you can trust, keep them involved in any way possible as they will surely open up new doors for you as well as be able to locate necessary gatekeepers for you. It is also useful to take note, the roles of men and women in the tribes or in the society in general. This may not be as apparent in urban areas such as Kampala, but when focusing in more rural areas, these differences may be more drastic depending on the specific region. Whatever is implemented, must be done by first pinpointing existing problems and then implementing something to solve these problems. In order to do so, the end users themselves should participate in the need-identification process; they should be asked what issues exist in their society and how they wish to overcome those issues. Once this is established, they can then be asked how could the community sustain those potential solutions. These same people should also be involved in the development process as education is a critical key factor to pass on immediately to the end users, in order for them to obtain knowledge of the solution as well as develop familiarity with it. This way the product and its functions will not be too foreign for the locals to adapt. This is not to say though that Ugandans are against imported commodities. What is more important is that they understand what value the solution brings to them. In the development process it is also good to remember that whatever information is provided, whether it comes from a school or from government, regardless of whether it is positive or negative, it may occasionally be exaggerated and facts will be made out to be much better or worse than they are in reality.

While flying back to Finland with all of these new fresh perspectives in mind, it is safe to say that the lessons learned by the students from each of the interviews would certainly help towards further development of their concepts.

Finland

A few months into their project, the whole collaboration team received great news that the collaboration was granted funding for the next 3 years. This in turn, however, caused an adjustment in the ultimate goal of the IDBM team and instead of specifically creating a localized product development methodology, in its place they would establish the foundation for the upcoming 3-year partnership. This official partnership would involve UNICEF Finland, UNICEF Uganda, Aalto University, Helsinki University, Makerere University, and Biolan Ltd. The main implementing partners of the partnership would be UNICEF Finland and Makerere University. UNICEF Finland would help evangelize and integrate both the Human Rights Based Approach (HRBAP) as well as the Child Rights Based Approach (CRBP) into the outcomes of the partnership. Makerere University would act as the provider, sharing knowledge about the local culture while providing any related mentoring and support on the field. The other partners would consist of the following: Aalto University acting as the main provider of innovation development education and curriculum; Helsinki University involving students from the social and cultural anthropology department; UNICEF Uganda also providing support where needed and working to help promote innovations that rise out of the collaboration; UNICEF Gulu mentoring the students while they are in the field and acting as a liaison between the project and local government; UNICEF Innovation Lab providing a meeting place and innovative atmosphere for stakeholders to thrive in; and Biolan Ltd. representing private sector and acting as a mentor for local SMEs with interest in producing the outputs of the collaboration.

It was also decided that with the new partnership agreement, UNICEF Finland would create a new position of project manager specifically for this collaboration. As the previous UNICEF Finland representatives' involvement in the collaboration was only part of their full working duties, by hiring a person solely for the duty of acting as the project manager for the newly formed partnership, it would mean a greater capacity and time availability from UNICEF Finland's side. A Finnish woman named Saara with previous experience in working for the UN would come to be hired for this position and

Annika would remain at UNICEF Finland continuing her role of Head of International Advocacy.

Uganda

The team's second trip to Uganda would now be fairly different considering that they wouldn't focus on establishing a tool for localization but rather on developing the 3-year plan for the collaboration. In order to do so, the team wanted to once again interview as many relevant persons as possible to both gain an understanding at where each key stakeholder stands as well as gain deeper knowledge into the Ugandan business environment. This was especially necessary considering private sector would officially be involved in the collaboration and UNICEF had not yet collaborated with a local company in new product development.

The IDBM team was on a mission to extract from each key stakeholder – UNICEF Finland, UNICEF Uganda, Aalto University, Makerere University, University of Helsinki, and Biolan – how they saw the collaboration going forward. The team wanted to understand what concerns each stakeholder had in involving each of the other specific main stakeholders, and they also wanted to recognize the benefits that these stakeholders believed the other institutions involved would be able to offer them. In other words, they were interested in the motivation of each partner to participate in the partnership. As Annika and Saara were both in Uganda at the time, the team was able to carry these interviews out both with them as well as with staff from UNICEF Uganda, and Makerere University.

The team also made a point to visit other local NGOs as well as the Uganda Investment Authority, incubation hubs, and paid another visit to the Honorary Consul of Finland. With each of the people that the team met with, they always asked if there would be further recommendations for other people whom they should meet. This allowed for them to expand the network of trusted individuals and organizations in the Kampala area as well as obtain vital information from each new person they would come in contact with.

Finland

Back in Finland, despite the short amount of time they had remaining, the IDBM team brought their powers and experience together to complete the plan for the next 3 years of the collaboration. This plan would contain all of the necessary information both from over the years of the collaboration as well as the crucial steps to take going forward.

This plan would cover everything from lessons learned and information about Ugandan society to capacity building and analysis and information on preparing for fieldwork. From the information shared by the student teams over the years and each of the solutions developed by them, suggestions from how to move from invention to innovation in the Ugandan context would also be clarified in the plan. As the Human Rights Based Approach needed to be incorporated into the whole goal of the work over the 3 years, a training manual and tools for this approach would also be provided in the final plan.

Considering the amount of experience that not only that year's IDBM team had gained but also the experience gained by all stakeholders over the nearly 4 years of the collaboration, it was very beneficial for the team to have this opportunity to compile all of the useful facts of the collaboration. This plan would present future stakeholders the possible to easily grasp what had already happened and how to best continue forward with discovering, developing, and sustainably implementing WASH innovations for children in Uganda.

Going into the future, starting in Fall 2014 the 3-year plan will be put into action with new teams of students as well as new stakeholders becoming involved in the collaboration. One new group of stakeholders that will join the collaboration during the next 3 years will be a number of Ugandan SMEs in order to support local production and distribution of outputs.

As for the Elephant Tap, the plan is to continue to take the necessary steps in order to fashion it into a sustainable and viable product available to Ugandans not only through the UNICEF Uganda WASH program but also through local distributors as well. Irena

and a fellow ADF model-maker have further developed the tap after the end of the previous IDBM project team in early Summer 2014. They have now managed to design the same tap using plastic, which may prove for successful results going into the future. Biolan who is now an official partner of the collaboration, has additionally shown particular interest in bringing the Elephant Tap back into Finland, but this has only been mentioned so far in discussions with the company.

5.0 DISCUSSION AND ANALYSIS

The previous section presented the case study of this thesis. The purpose of this section is to review the key findings from the empirical and theoretical research and utilize the theoretical framework presented in section 2.4 to analyze the case study. The evidence presented through the empirical data will be compared and contrasted with that of which the theory provides. The analysis will provide insight into whether the case itself provides a new, collaborative method for carrying out reverse innovation, as well as a means to understand how to carry out reverse innovation in the context of Uganda. When referring to the development of a concept and product, this analysis will focus on that of the Elephant Tap as it was the furthest developed out of all the concepts.

The discussion and analysis will be conducted in four sections, corresponding directly with the research questions presented in section 1.4. Therefore, the first part will address research Question 1 by discussing the theoretical framework. The second part will address research Question 2, by utilizing the theoretical framework to assess the information presented in the empirical research. Afterwards, Question 3a will be addressed based on theory and on the evaluation of Question 2. Finally, Question 3b will be addressed based on findings from empirical research. Each section will begin with the relevant research question and then continue with a discussion and analysis.

5.1. Theories and Principles of Reverse Innovation

This section will address Research Question 1: What key theories and principles underlie the process of reverse innovation?

As reverse innovation is a young, emerging phenomenon it was quite a complex process to uncover specific information on the topic itself. In order to gain significant information, the literature review was constructed over the span of several months, constantly being updated with new, relevant information that was published. Despite the great range of

literature covered, some aspects of reverse innovation were still difficult to explain through various references to academic literature simply due to the lack of published opinions on specific aspects of reverse innovation.

In order to address the background of the topic, the research first addressed innovation in developing countries in general as there has increasingly been coverage of different types of innovation taking place for and in developing countries as well as innovations emerging out of developing countries. Not only are innovations emerging out of developing countries, but there are also companies coined as ‘emerging giants’ by Govindarajan and Trimble (2012) that are rising out of developing countries and slowly becoming a threat to Western multinational corporations. Developing countries are increasingly proving fertile for innovation due to the unique circumstances and needs present in these countries, thus attracting the presence of multinationals to engage in innovation initiatives there. This type of resource-constrained innovation, has been given many different terms including cost-innovation, good-enough innovation, or frugal innovation, amongst others. (Zeschky et al. 2014b, p 20) However, literature in recent years has introduced a new type of resource-constrained innovation, one that not only is carried out in developing countries but also is subsequently brought back into developed countries bringing with it, an entirely new offering to advanced market consumers. Govindarajan and Trimble (2012) have popularized the term for this process as reverse innovation.

Despite a recent increase in literature published on reverse innovation, covering what it is, what it is not, providing toolkits for setting up a reverse innovation initiative, or proposing various flows of innovation within the process of reverse innovation, the literature does not appear to present a coherent, detailed framework for the entire process of reverse innovation. Therefore, a theoretical framework was presented in this thesis, modeling the process of reverse innovation based on key factors extracted from extant literature. The theoretical framework can be found in section 2.4.

The theoretical framework, was divided into ‘Action Points’, ‘Locus of Action Points’, and ‘Outputs’. The flow of reverse innovation in the product life cycle originally proposed by Corsi (2012) was integrated into the framework by including the action

points of ‘Concept Ideation’, ‘Product Development’, ‘Primary Market Introduction’, and the subsequent ‘Secondary Market Introduction’. Added on to this however were crucial action points covered in literature regarding the formation of a team dedicated to the reverse innovation initiative, ‘LGT Formation’ and the evaluation of developing country-context needs, ‘Needs (Gap) Assessment’. Extant literature also covered the need to maintain a clean-slate approach throughout the beginning of the reverse innovation process in order to avoid prior assumptions, referred to as dominant logic, to influence the product development process.

The action points set a structure for the flow of innovation represented by either ‘A’ for advanced market or ‘D’ for developing market; the letter corresponding to the locus of the action point, or where the action point takes place. The first two, newly proposed actions points being ‘LGT formation’ and ‘Needs (Gap) Assessment’, were specifically given either ‘A’ or ‘D’ in their columns based on where these actions take place. The reasoning for ‘LGT Formation’ solely taking place in ‘A’, or the advanced market, and ‘Needs (Gap) Assessment’ taking place in ‘D’, or the developing market, follows beliefs illustrated in current literature regarding the process of reverse innovation. It does not however reflect the potential of an emerging market MNC to engage in reverse innovation, or the possibility of building the LGT straight up from the developing market; it only focuses on MNCs from developed countries engaging in reverse innovation. These could be subjects to explore in further research.

As the framework implies, and as Corsi (2012) originally proposed, the different stages from ‘Concept ideation’ all the way to ‘Secondary market introduction’ can take place in either advanced or developing countries and still be considered reverse innovations. Although some cases will prove to be stronger reverse innovation initiatives – indicated by the dark shaded areas – with a greater amount of the work focused in the developing country, as long as there is a reversal of the innovation from developing to advanced country during the product life cycle and the product is eventually introduced into an advanced market, then it can be considered a reverse innovation. Before there is a reversal from developing to advanced country however, the framework indicates that it is essential to carry out a second round of needs assessment for an applicable advanced

market before the product is introduced to that market. This will allow for any necessary adaptations to be made to the product so it relates more directly to the desires of advanced market consumers.

Finally, according to literature, the outputs during the process of reverse innovation would initially be business model innovation, organization innovation, and frugal innovation. (Zeschky et al., 2014a) But taking a closer look at the frugal innovation aspect in specific, opened up two other possibilities in addition to frugal innovation which could lead up to a reverse innovation. These are cost-innovation and good-enough innovation. (Zeschky et al., 2014b) Once the innovation is introduced to the primary market and subsequently to the secondary market, according to theory on reverse innovation, it provides an entirely new value proposition to the receiving markets.

Borrowing from existing theory on reverse innovation, the framework addresses Research Question 1 by presenting the key theories and principles underlying the process of reverse innovation in a physical model. In chronological order, the model first conveys the necessary action points in the process of reverse innovation being: LGT Formation, Needs (Gap) Assessment, Concept Ideation, Product Development all carried out with a Clean-Slate Approach. The final two action points address introduction of the output into the market, with Primary Market Introduction and then Secondary Market Introduction. Next, the model addresses the ten existing possible flows of the locus of innovation between advanced and developing markets during the reverse innovation process. Thus implying that in order for a process to be considered a reverse innovation, it must sequentially run based on the innovation flow of one of the ten listed flows. By shading some of the rows in grey and some in white, this indicates that process of reverse innovation can be either strong (grey) or weak (white) based on the sequence of the flow. Finally, the model presents the outputs that occur during the reverse innovation process. It shares that before market introduction, reverse innovation produces either a frugal/cost/good-enough innovation as well as establishes business model innovation and organization innovation. Upon market introduction, towards the end of the reverse innovation process, a new value proposition is the output of both primary and secondary market introduction. The theoretical framework upholds that each of these elements must

be present along the course of the innovation process in order for it to be wholly considered as a process of reverse innovation. It is essential to note that this framework represents a model for a Western MNC to engage in the process of reverse innovation. The reason for this is that the existing literature on reverse innovation, provides recommendations for why and how multinationals should engage in the process of reverse innovation.

This opens up an interesting discussion in the following section as the case study – predominantly involving academia and an international development organization engaging in frugal innovation, and potentially reverse innovation – is compared and contrasted with the theoretical framework, which as just mentioned relates to private sector, or MNCs.

5.2. Collaboration and Reverse Innovation

This section will address Research Question 2: Can a frugal innovation initiative carried out collaboratively evolve into a process of reverse innovation?

In essence, the previous section answers specifically what key elements should be involved in the process of reverse innovation, based on existing theory. This section will attempt to utilize these key elements, presented specifically in the theoretical framework, to explain and understand the unique case study. This will allow for an evaluation of whether in fact a frugal initiative carried out collaboratively can evolve into a process of reverse innovation. It is essential to point out from the beginning that a multinational corporation was not the organizer of this initiative, as typically reverse innovation initiatives have been explained in literature. Rather, it was the international development organization, UNICEF in collaboration with an academic institution Aalto University and Makerere University, later accompanied by the company Biolan. For comparison purposes, over the course of this analysis UNICEF Finland will be viewed as the headquarters – the MNC – of this initiative, and the product development teams formed

by the students will be viewed as the subsidiaries – the LGTs. The assumption is made that the product development teams are adequate enough to be considered an LGT. The elements surrounding the creation of the Elephant Tap will be utilized when discussion and analysis relates to the specific product being developed in the innovation process.

Utilizing the theoretical framework, the case study will now be analyzed based on the: 1. ‘Action Points’, 2. ‘Locus of Action Points’ and finally, 3. ‘Outputs’. The analysis of the action points in specific will be split into first analyzing the LGT formation and needs (gap) assessment, and then analyzing the action points representing the product life cycle: concept ideation, product development, primary market introduction, and secondary market introduction.

Action Points: LGT Formation and Needs (Gap) Assessment within the Clean Slate Approach

LGT Formation

As literature holds, it is necessary to build LGTs in order to succeed in the process of reverse innovation. (Govindarajan and Trimble 2012, p. 54) The LGT model is based on five critical principles: “Shift power to where the growth is...Build new offerings from the ground up...Build LGTs from the ground up, like new companies...Customize objectives, targets, and metrics...[and] Have the LGT report to someone high in the organization.” (Immelt et al. 2009, pp. 63-64) LGT’s should be created from scratch, selecting new team members from either inside or outside of the company who prove the ability to maintain a clean-slate approach by exhibiting the possibility to offer fresh, new perspectives and a valuable skillset to the team. (Govindarajan and Trimble 2012, p. 56) Corsi et al. (2014) and Lin and Beyerlein (2006) added on to this by explaining the great need for a truly global, diverse team when engaging in global innovation, in order to bring new perspectives to the projects. Corsi et al. (2014) continue by sharing these teams require substantial support from people with authority at the headquarters as well as leadership within the LGT of people who have both autonomy and authority. (p. 34)

Evaluation of LGT Formation

As discussed in literature, there is typically one LGT team for the reverse innovation initiative. Looking deeply into the Case Study, there have been four LGT teams thus far; one during the academic year 2011-2012, a second one incorporating some of the team members from the first team during Summer 2012, a third one during the academic year 2012-2013, and then a fourth one during the academic year 2013-2014. During the course of the 4 years of the collaboration, there was frequent movement amongst the student team members involved. As a side note, this also occurred within UNICEF, having the role of the project representative from UNICEF Finland being re-filled by new representatives twice. This proved to be the case as well at UNICEF Uganda and UNICEF's Innovation Center in Uganda; employees or consultants were on short contracts and often were transferred to different UNICEF offices. The frequent movement and replacement of stakeholders may have lead to problems in transferring built-up knowledge and thoroughly comprehending the task at hand. On the other hand, extant literature never made reference to the fact that the LGT must maintain the same members throughout the initiative. It can be argued that this frequent turnover of people involved as well as the limited time spans of the individual project teams may have helped with constant iteration and testing of proposed ideas. As Immelt et al. (2009) argue, "It's more important to learn quickly by efficiently testing assumptions."(p. 64) Ultimately, it is challenging to decipher whether in fact it was more beneficial or detrimental to the initiative to have such great movement of stakeholders involved.

In terms of shifting power to where the growth is, it was initially discussed in literature that once established, the LGT should be based in the local, developing market and ultimately an innovation will emerge out of this developing country and be brought into an advanced country to become a reverse innovation. As the views on this theory progressed and it was later proposed that an initiative can still be considered a reverse innovation initiative even though there is a shift from developing to advanced to developing country during the course of the initiative, although potential movement of the LGT was never explicitly covered. However, there is literature that covers the roles of

headquarters and subsidiaries, which takes the stance that the subsidiary is always present in the local context. It can be argued though that as long as there is a local base of project representatives, there is no reason to reject the idea of potential movement of members in the LGT between the location of the ‘subsidiary’ and the ‘headquarters’. Considering this along with the Case Study’s several LGT teams, moving back and forth between Uganda and Finland, each team spending approximately 2-5 weeks in Uganda, it could be concluded that there was insufficient local presence of the LGT team. However, when considering the structure of the project teams who were directly related to the development of the Elephant Tap, there were local Ugandan students involved on the team and UNICEF Uganda and Makerere University were involved as local partners. Therefore, it could also be debated through the involvement of these members, both directly on the project team and as partners primarily based in Uganda, that there was constant local presence of team members even though the whole LGT was not always present in Uganda.

In regards to building LGTs and new offerings from ground up, considering that literature has recommended involving as many new people into the initiative as possible and creating new titles for them, this was certainly proven to occur in the in the development of the project teams in the collaboration. As Govindarajan and Trimble (2012) had shared, “In particular these LGTs must unite people who understand emerging-market needs and people who can provide emerging-market solutions. They must combine market insight with technical capabilities. They must integrate sales and marketing with R&D.” (p. 55)

Considering the first project team – or LGT – who commenced the creation of the Elephant Tap, Irena as the project manager had experience in working in Uganda, therefore having a basic understanding of the emerging-market needs. Also Andrew, as the supporting coach for the team, had gained basic experience during his initial visit to Uganda. However, Irena and Andrew were both involved only during the first project year and the Summer Implementation project. Assigned to the subsequent project teams, was a project coach from the IDBM program, who did not have experience in the field. By involving multidisciplinary Master’s students as team members from outside of UNICEF, this allowed for the initiative to not only have its own product development

team and people who could provide new clean-slate solutions, but also offer a more effective and innovative environment through the marriage of business, design, and engineering skillsets. Therefore, the LGTs were built from the ground up and were able to construct ideas with a clean-slate approach. In the beginning the LGT leaders – Andrew and Irena – were able to contribute their emerging market experience to the teams, however in subsequent project teams the coaches should have exhibited more experience of the context or Andrew and/or Irena should have been kept involved as team leaders.

It was stated that objectives, targets, and metrics must be customized for LGTs. “LGTs depart so heavily from the norms only because they have a special mission that lies outside the organization’s current capabilities.” (Govindarajan and Trimble 2012, p. 54-55) Reverse innovation efforts also exhibit an immense amount of uncertainty, therefore the learning process should be fast and controlled. (p. 65) As members of the project team eventually came to discover, UNICEF did not even have a standard, existing product development model nor had they engaged in an initiative similar to this previously. Therefore, the circumstances proved fertile for an entirely fresh start for this initiative. Due to the short time spans during the academic year for concept and product development, the teams were forced to iterate and revise plans frequently, constantly questioning the significance of their ideas. It can be maintained that their learning process was surely fast and controlled, as they also had deadlines for deliverables and various checkpoint meetings with UNICEF Finland as well as other relevant stakeholders along the duration of the process. The objectives and targets were certainly customized as each year the teams were given a new brief, with new targets that only they would work on fulfilling.

In having the LGT report to someone high in the organization, there was initially a greater amount of attention put into the project from higher levels of UNICEF, including the co-lead of UNICEF innovation, Christopher Fabian, from UNICEF’s headquarters in New York. Over time, though, the responsibility of the initiative was transferred to a person in charge of International Advocacy at UNICEF Finland. Despite this fact, the person put in charge of managing this initiative from UNICEF’s side did have enough

authority for proper management and impact on the work and the head of UNICEF Finland was additionally updated regularly on the progress of the project. Thus, the project team did have someone high to report to in the organization. Although it would have been ideal for the project team to report to Christopher Fabian, as the ‘headquarters’ of this project was at UNICEF Finland it was necessary to have the project managed from UNICEF Finland.

Needs (Gap) Assessment

Theory presents that a needs gap opens up new opportunities for business. The needs gaps and starting points for reverse innovation opportunities that specifically exist in developing countries are the “performance gap, the infrastructure gap, the sustainability gap, the regulatory gap, and the preferences gap.” (Govindarajan and Trimble 2012, p. 14) The authors believe that in order to discover opportunities, researchers need to spend time with their target because only then can the needs of the target customer be understood. (p. 61) These authors hold the belief that in carrying out reverse innovation, a local growth team should carry out a market-back approach, which begins with studying the particular needs of consumers in the developing market and then working back to an appropriate solution. (p. 38) Petrick and Juntiwassarakij (2011) and Prahalad (2010) explain that success in the Bottom of the Pyramid comes from a dedicated approach to building local presence, which includes acquiring local knowledge and gaining local trust.

Evaluation of Needs (Gap) Assessment

Each year that a new team became involved in the project, as a successor of the previous team, at least the first two months were dedicated to not only discovering what had already happened but to become acquainted with the context in which they were working. Every year, this included initial background research on UNICEF and Uganda and then a 2-week field research trip to Uganda for the sole purpose of becoming acquainted with the field and discovering the needs gaps. Meeting with the local UNICEF office,

collaborating with local Ugandan teammates, networking and connecting with other relevant local officials, as well as working directly in the field with children allowed for the project teams to obtain an extensive understanding of not only Ugandans but also specifically children in rural Uganda.

As literature did not provide adequate time frame to dedicate to the needs assessment stage, it is difficult to say whether the initial 2 weeks spent in Uganda by the project teams was sufficient. In their personal reviews, most teams felt that they would have required additional time in the field, however, considering the course schedules in academia it may not have been possible for them to stay for an extended period of time.

In focusing specifically on the product, which was most favored and developed furthest – the Elephant Tap – it appears to have been designed mostly based on existing performance, sustainability, and infrastructure gaps. Infrastructure gaps being the lack of proper hand-washing facilities; performance gaps being the lack of affordable, robust, difficult-to-steal taps; and sustainability gaps being the lack of taps that could be produced, sold, and maintained locally using local materials. As of Spring 2014, the Elephant Tap was still intended to address all of these gaps, however, according to prior analysis carried out by the teams, it proved to still need further developing especially to maintain a lower price point and to construct a sustainable business model for it before it was introduced to the Ugandan market. It can be concluded though that the idea and development of the Elephant Tap was driven purely by needs identified in the field, therefore simultaneously incorporating a clean-slate approach into the needs assessment.

This statement leads to the following action points of the theoretical framework, pertaining to the product life cycle: concept ideation, product development, primary market introduction, and secondary market introduction.

Action Points: Concept Ideation & Product Development within the Clean Slate Approach, and Market Introduction

The action points of the product life cycle will further be analyzed in context of the Case Study in this section while considering the Clean Slate Approach specifically for Concept Ideation and Product Development. Then the action point of Market Introduction will be further analyzed for Primary and Secondary Market Introduction.

Von Zedtwitz et al. (2014) posed that the product life-cycle theory was originally proposed by Vernon (1966, 1979) and then adapted to fit the recent examples in changes in the global flow of innovation (p. 1) and specifically pertaining to that of reverse innovation by Corsi (2012) and von Zedtwitz et al. (2014). Corsi (2012) shares that Vernon originally built his theory based off of the belief that the location of innovation activities was mainly in advanced countries through the concept ideation to primary market introduction and then later at the end of the product life cycle when labor costs became a separating factor, the products would move into less developed countries. (p 48) “Since Vernon’s original thesis, developing countries have moved center stage for many MNCs as important markets to serve...and foreign R&D is gaining foothold in developing countries.” (von Zedtwitz et al. 2014, p. 4)

Govindarajan and Trimble (2012) showed strong beliefs regarding reverse innovation incorporating clean-slate thinking. (p. 55) This meant starting from scratch and exploring who will be the target market, what value will be delivered to them, and how will that value be delivered. It also signified that each stakeholder involved, must learn about the new conditions and necessities of the local context. (p. 38) Petrick and Juntiwassarakij (2011) also agree that companies in emerging markets need to be prepared to consider a local path to the market. This path is “locally focused and often defined by socioeconomic necessity. Here, products and services are reduced to their essence, resulting in lean-featured offerings that capture essential functionality. Often...these local innovations are so successfully conceived that they appeal to other geographic regions.” (p. 27-28)

Evaluation of Concept Ideation & Product Development within the Clean Slate Approach

Focusing on the Elephant Tap in specific, in both the concept ideation and product development process, the project teams appeared to carry out a clean slate approach. Based off of the initial research trip to Uganda carried out in Fall 2011, the project team sought out to discover the main needs of the rural school children. Based off of their findings in the field, when they returned to Finland the team began ideating what could be produced to fill the specific needs that they identified with problems related to hand-washing, i.e. broken and stolen taps, taps that would dispense water too quickly - wasting precious water, taps that would re-contaminate children's hands, etc. Therefore, it can be argued that concept ideation was predominantly based on clean-slate approach. Eventually, the project team arrived at the idea of a new tap and the Aalto University students from the team began prototyping it in Finland while the Makerere University students were subsequently prototyping it in Uganda. Upon the second research trip to Uganda, when only Irena attended the trip along with the IDBM team, the tap was tested there in order to be further developed and this process of testing and development continued well into the summer and autumn months of 2012. The product development of the Elephant Tap was predominantly based on user testing and feedback. However, the materials that were initially used to develop the product were from Finland and not from Uganda, which led to future complications in establishing a localized, sustainable business model for the Elephant Tap. Nevertheless, as the tap was built from scratch and not based off of an existing model while presenting an entirely new value proposition, it will be concluded that the Elephant Tap predominantly did have a clean-slate approach through concept ideation to product development.

Evaluation of Market Introduction

In regards to the primary and secondary market introduction, it was clear from the Case Study that the Elephant Tap was never officially introduced to the primary market of Uganda, despite the fact that it was partially implemented for testing. The project team,

which was evaluating the development of the tap during the 2012-2013 academic year concluded that the Elephant Tap is still in phase of concept generation, according to their toolkit for product development. According to their toolkit, this phase of concept generation occurred after that of idea generation (phase 2) and idea screening (phase 3). Thus, in attempts to relate this fact to the presented theoretical framework, it can be concluded that the Elephant Tap is still in the phase of product development. Therefore, the Elephant Tap has not advanced through each of the action points yet and it cannot be established that the Elephant Tap and processes surrounding it have undergone a process of reverse innovation.

The following section will examine the locus of the action points during the flow of reverse innovation.

Locus of Action Point

As Corsi (2012) and von Zedtwitz et al. (2014) defined reverse innovation as a global innovation process in which there may be a shift in the flow of reverse innovation from a developing market to an advanced market, as long as the solution is either primarily or secondarily introduced to an advanced market. By innovation flow, they denote that the specific location of the work during the innovation process may shift although the main idea of the innovation stays the same. They proceed to establish a model of 16 global innovation flows and then continue to map out the 10 different possibilities for flows of reverse innovation within the map of global innovation flows. These 10 flows of reverse innovation were incorporated into the theoretical framework of this thesis to highlight the different potential flows of innovation in the process of reverse innovation.

Based on additional literature on reverse innovation, it became evident that in order to fully explain the entire flow of the process of reverse innovation and not just the life cycle of the product, two sections would need to be added on to the original model: 'LGT Formation' and 'Needs (Gap) Assessment'. Based on extant literature, it was determined that LGT Formation in the process of reverse innovation as we know it, occurs first in the advanced market, which is why each of the 10 innovation flows begins with an 'A'. This

is, as mentioned, based on the case of a Western MNC organizing the reverse innovation initiative. It was also determined, based on popular belief in literature, that the Needs (Gap) Assessment must take place in the developing market context, hence why the letter ‘D’ is represented in the entire second column.

Evaluation of the Locus of Action Point from LGT Formation to Secondary Market Introduction

This section will analyze in which location – either advanced market ‘A’, or developing market ‘D’ – each action point took place along the flow of the reverse innovation process.

Beginning with the LGT Formation, although there were 4 different project teams formed during the course of the project, including the initial planning team, each of them were predominantly, initially formed in Finland – the advanced market. Specifically analyzing the first team that came up with the idea for the Elephant Tap during the 2011-2012 academic year, they were also predominately formed in Finland even though there were four Makerere University students chosen by the Ugandan university’s staff to be members on the project team. Nevertheless, the bulk of the team was formed in Finland, thus it will be concluded that the LGT Formation occurred mainly corresponding to the letter ‘A’ – advanced market – even though it occurred slightly in ‘D’ – developing market, as well.

For the Needs (Gap) Assessment, although the teams were never exclusively present in Uganda, each of them initially went to Uganda for a 2-week time period to carry out a needs assessment. This was also specifically the case for the needs assessment prior to the concept ideation of the Elephant Tap; the entire team traveled to Uganda for a two week time period. As the needs assessment has not been given a specific time frame, it can be concluded that even though it was only for a 2-week period, the Needs (Gap) Assessment was always fully carried out in the local, developing market context of Uganda. Therefore, the corresponding letter for where it took place is confirmed as ‘D’ – developing market.

For the Concept Ideation, or where the idea of the product concept originated in, this often occurred once the team had arrived back to Finland from Uganda. This also held true in the specific case of the Elephant Tap; the idea for the Elephant Tap was based off of market insight discovered in Uganda and then this information was collected together in Finland to come up with the idea for the tap. Therefore, the corresponding letter for concept ideation would be 'A'.

For each of the project teams, except for the Summer Implementation team, after their ideation phase in Finland, they would begin prototyping and developing their ideas in Finland, initially. However, they would then embark on a second trip to Uganda to test and further develop their concepts at the time, after which they would return to Finland and continue development. During the case of the Summer Implementation project in specific however, they purely did the development of the products and concepts in Uganda. Looking at the Elephant Tap specifically, the first project team during the 2011-2012 academic year tested and developed the tap both in Finland and Uganda. Its initial development began in Finland in January 2012 and immediately after, almost simultaneously, in Uganda. Then in March 2012, some of the project team responsible for the tap further developed it in Uganda. After that, development continued in both Finland and Uganda until the Summer Implementation project continued its development in Uganda starting in June 2012. From that point on though, the physical product of the tap itself was further developed in Uganda. However, business modeling and further ideas and evaluation of the taps development occurred mainly in Finland and occasionally in Uganda during the following academic year from 2012-2013 by the new project team. Despite this complex reversal of development, it can be argued that the development of the Elephant Tap has occurred more often in Uganda rather than in Finland, as development of the tap in Uganda progressed even if the active project team was not responsible for doing so. This was the case when Felix, continued the physical development of the Tap in Uganda after the Summer Implementation project while the IDBM team was evaluating the implementation of the Elephant Tap and related products. The tap had also been temporarily implemented at a number of facilities in Gulu, Uganda so it could also be argued that the product developed to a greater extent in Uganda even if more time was spent in the very initial stages of development in Finland. Based off of the

provided information, it will be concluded that the letter ‘D’ will be given for product development stage of the Elephant Tap as its development predominately took place in Uganda, even though some of the development took place in Finland as well.

The action point of primary market introduction cannot be entirely addressed, as the Elephant Tap has not been introduced into the primary market. However, based on the information shared in the Case Study, especially considering that each of the project teams were given the brief to develop an output specifically for the Ugandan context, we do know that the intended primary market is Uganda. So it can be assumed that this will be ‘D’.

The action point for secondary market introduction is even more difficult to address, as it was never officially discussed whether the output(s) would be distributed globally. Therefore, another assumption needs to be made based off of key points. During the course of the collaboration, the Finnish company Biolan had expressed their interest in getting involved somehow into the project – first by raising the option of having them donate some of their latrines to the project and then later on mentioning that they would potentially be interested in bringing the tap back to Finland and distributing it there. As Biolan became an official partner in the collaboration in Spring 2014, it increases the possibility and opportunity for them to reverse the innovation into an advanced country such as Finland. If this were the case, then naturally ‘A’ would be applied to the action point of secondary market introduction.

Output

Frugal/Cost/Good-Enough Innovation

Based on a reference model for reverse innovation proposed by Zeschky et al. (2014a), three determinants of reverse innovation are characterized, one of those being frugal innovation. In a later article by Zeschky et al. (2014b), the authors further conclude that there are in fact three distinct types of resource-constrained innovation that reverse innovation can be built on: cost, good-enough, or frugal innovation. (p. 21) Cost-

innovations were explained as, “solutions that offer similar functionalities to Western products at lower costs for resource-constrained customers...They can also attract more affluent customers seeking a bargain or expand the market for what had once been a niche or specialty product.” (pp. 21-22) They proceeded to describe good-enough innovations as, “tailored functionality at a lower cost...like cost innovations, good-enough innovations achieve low price points...however, are also adapted or re-engineered to fit the specific use requirements of the target market.” (p. 22) Finally, they expose frugal innovation as, “innovations specifically developed for resource-constrained customers in emerging markets...[that] build on good-enough innovations but feature new applications developed specifically for resource-constrained environments, generating an entirely new value proposition.” (p. 23-24) Out of each of the resource-constrained innovations, the authors describe frugal innovation as the most challenging as entirely new limitations need to be discovered and defined before creating frugal innovations. (p. 24)

Evaluation of Frugal/Cost/Good-Enough Innovation

In determining whether the collaboration proved to exhibit either frugal/cost/good-enough innovation, or none of them, a brief overview of the action points before those of market introduction will be discussed.

Each year, the project teams were formed from scratch and were given a personal brief by UNICEF Finland. Based on the fact that each team was new to the context of the work, they were required to start from a blank page, first carrying out background research in Finland and then assessing needs gaps in Uganda before returning to Finland to start ideating and prototyping. It is clear that from the start, based on the briefs given to each of the project teams, that the rural Ugandan school children were the target audience for which solutions would be developed. Based on the information provided in the Case Study, the project teams involved with the assessment, ideation, and development of the Elephant Tap each had to learn to develop this product based on an entirely foreign set of constraints that they came to learn over time. They developed the Elephant Tap with the

needs and constraints of the context in mind, while eventually attempting to localize the entire procurement and development process of the tap. With this information, it can be concluded that the work with the Elephant Tap has been carried out in a process of frugal innovation.

Business Model Innovation

Serrat (2012) explains a business model as “the core design, the logic, that enables an organization to capture, create, and deliver value to meet explicit or latent needs.” (p. 3) Teece (2010) continues by sharing views on business model innovation by explaining in order for organizations to continue to generate value they must exhibit the ability to establish new business models. Adding on to this, he explains that it is not enough to simply offer an interesting value proposition, because unless a type of profitable business ecosystem is established around it, provided the expected quality and complementing price point, ultimately the initiative will be considered unsuccessful regardless of whether the innovative solution is welcomed by consumers. (p. 186)

Teece (2010) discusses that, “Designing a new business model requires creativity, insight, and a good deal of customer, competitor, and supplier information and intelligence.” (p. 187) It is rare that the perfect business model is clear from the beginning of new initiatives, therefore it is not only important to focus on building a flawless business model but also be ready to adjust the model to more favorable circumstances along the course of its development. (p. 187) The characteristic that leaders of business model innovation demonstrate is the ability to acquire a thorough understanding of their target consumers’ fundamental needs, fully comprehend how other players in the market are either succeeding or not succeeding in addressing these needs, and ultimately recognize the possibilities and path to improvement. (p. 188)

Specifically in the context of developing markets, Zeschky et al. (2014a) maintain that the traditional business models of Western MNCs, although very successful in the past, are now being threatened as resource-constrained consumers are increasingly requiring affordable solutions. (p. 256-257)

Evaluation of Business Model Innovation

In evaluating the business model innovation of the collaboration, both the organization of the project as well as the business model development of the Elephant Tap itself will be covered.

Starting off with the Elephant Tap, although a business model has not been completed for it yet, it is clear from the evidence of the Case Study that great efforts have been put in to establishing greater value as well as creating a sustainable business ecosystem around it. The value that the Elephant Tap has set out to offer, combines a robust solution that is easy to use and maintain, difficult to break and steal, offering unique functions that regulate both the amount of water used and time it would take to wash one's own hands. This ultimately teaches children the proper amount of time they need to spend in washing their hands, as well as suppressing the amount of recontamination of hands by incorporating a function that does not require the user to turn off the tap after washing his/her hands. Also, the project teams had placed great efforts in trying to create a sustainable business ecosystem around the Elephant Tap. This fact came into play especially while the teams were trying to establish a plan for the tap to be manufactured locally; they sought out to build a network of local stakeholders who could take part in the tap's production and maintenance. Additionally the teams spent countless hours in attempts to develop a local procurement plan for the materials needed for the tap. What they were trying to achieve was rather unique as they had discovered that there was insufficient local manufacturing; typically most products would come from Kenya, China, or India.

It appears that the organization of the collaboration could in itself be considered a business model innovation as well. This holds true for several reasons. The first being, that this collaboration between UNICEF (as an IDO), academia, and eventually private sector as well, is the first of its kind. UNICEF had recognized problems that need to be addressed in their field of work that other companies and organizations were insufficiently tending to. However, UNICEF also acknowledged that it does not

necessarily specialize in the area of research and product development and does not have significant manpower to specifically address this area. Therefore, upon meeting with Aalto University delegates initially and subsequently with Makerere University representatives, it became clear that the multidisciplinary students of these universities – and academia in general – could offer what UNICEF is lacking in terms of R&D with a clean-slate mindset. Once concepts and products began to develop during the course of the collaboration, it also became evident to both UNICEF and its partners in academia, that although UNICEF would acquire the intellectual property rights of the products, it did not specialize in producing and distributing these products. Therefore, the need to involve private sector emerged later in the collaboration. Considering that this was an entirely new type of collaboration for UNICEF, it also became necessary to establish new effective ways of working and communicating in order to sustain the development of the collaboration itself. Based on the information in the Case Study, it is evident that there were greater difficulties in the beginning regarding understanding the roles of other stakeholders involved as well as individual roles and contribution to the collaboration. This proved to be a factor that developed over time and due to the pioneering nature of the collaboration, it was not a factor that could have been flawlessly executed from the start.

All of these factors combined prove that the project teams involved were working to establish an innovative business model for the Elephant Tap, although according to the theoretical framework, this has not yet been completed, as the tap has not been officially introduced into its primary market of Uganda yet.

Organization Innovation

When engaging in reverse innovation, Western MNCs now have to assess the style in which their organizations are structured in order to work in parallel with frugal and business model innovation. (Zeschky et al. 2014a, p. 257) Govindarajan and Trimble (2012) clarify that ultimately the clean-slate approach needs to be built through clean-slate organizational design (p. 55), which can be put into practice by the LGTs. Only with

clean-slate organizational design do LGTs have the ability to take a market-back approach instead of a technology-out approach. (p. 96) The existing R&D structures, or LGTs, need to be able to adapt to new processes and develop a new mindset to complement the frugally innovating. (Zeschky et al. 2014a, p. 257)

Zeschky et al. (2014a) propose the following points related to organization innovation – the strategic and operational roles of MNC’s headquarters and subsidiaries – in reverse innovation:

1. Whether the roles of the subsidiaries are strict and limited, or if they are highly self-directed, it does not have an affect on the capacity for a firm to carry out reverse innovation.
2. If the subsidiary has sufficient access to the Western MNC’s resources, there will be a higher probability for reverse innovation to occur.
3. If the Western MNC can accept the idea that the reverse innovation may replace its existing higher-end offering in the advanced country market, there will be a higher probability for reverse innovation to take place.
4. Initially, the reverse innovations need to be designed by the subsidiaries in the developing country context in order for frugal innovation to truly take place.
5. In order incorporate affordability, reverse innovations need to be developed by the subsidiaries in the developing country context. (pp. 266-270)

Evaluation of organization innovation

Through each point mentioned above, the ability for the collective efforts of UNICEF and academia to adapt their organizational structures will now be analyzed on numbers 1-5. Once again UNICEF Finland will be regarded as the headquarters and the project team will be regarded as the subsidiary, or LGT. Any discussion related to product development will focus on the Elephant Tap.

1. It is difficult to determine where exactly the locus of the global product mandate resided as one would first assume that it was at (‘the headquarters’) UNICEF Finland, as they provided the project teams with a specific brief as well as a set time schedule and

budget – also partially assigned by Aalto University. Additionally, the project teams' role was limited to gaining local knowledge and developing localized solutions. However, they were not limited to establishing innovation based on existing technological platforms, which Zeschky et al. (2014) claim as a determinant of the headquarters as the locus of the global product mandate. The project teams had a greater amount of autonomy than that and they were able to suggest changes in the project brief during the course of the work. Therefore, it will be concluded that the global product mandate didn't reside in either the headquarters or the subsidiary (LGT) rather they shared the responsibility.

2. When the project teams required existing knowledge from the field, UNICEF was able to both present them with existing information and UNICEF representatives connected and introduced the team members to a valuable, trusted network of relevant people and other organizations that could provide useful input into the project work. The only aspect that may be criticized is the lack of importance placed on the project work by some UNICEF employees in Uganda. For instance, this was evident from the cancelation of certain, important meetings. However, this occurred only with UNICEF Uganda and Gulu and as they were project partners and not represented as the 'headquarters', this information is then not entirely relevant. Another point to take into consideration was that the project teams had wished from the start to be given a better introduction into UNICEF and its experience in the field. However, the problem was not in the lack of will to share resources and information but more likely in the lack of time and understanding of what information was necessary to share. Therefore, it will still be established that UNICEF Finland did provide the project team with significant access to its resources.

3. This point is difficult to analyze due to the fact that UNICEF Finland would not necessarily be bringing any products back to Finland and there would be no related, existing solutions to cannibalize. However, if Biolan decides to specifically bring the Elephant Tap back to Finland, then it can be examined whether Biolan showed a willingness to accept potential product cannibalization.

4. As this point has been discussed in earlier parts of the analysis it will not be analyzed in detail here. It will be acknowledged though that based on needs that were identified by the project team visiting Uganda, they arrived at the idea of designing the Elephant Tap. Although the ideation mainly occurred in Finland, the basis of the idea came from the rural Ugandan context. In other words, the whole design process was not carried out in a resource-constrained environment but was primarily driven by the needs identified in the environment.

5. As this point has also been discussed previously in the analysis it will not be analyzed in further detail. To briefly go over the findings, the development of the Elephant Tap was carried out both in Uganda and Finland, but primarily in Uganda. The development was focused on localizing the entire offering of the Elephant Tap and meeting the price points suitable for the target audience in rural Uganda. Hence, although development was not solely in a resource-constrained environment, the outcome will be entirely based on the needs of the said environment.

It can be concluded that there was a great level of novelty and significance to organization innovation presented through the collaboration. A new type of organizational structure was established, not only through the stakeholders involved but also through the actions in which the stakeholders engaged in order to establish a successful collaboration.

New Value Proposition

“The unique ideas being generated to meet the needs of the bottom of the pyramid are transforming into revolutionary innovations...These innovations are both disrupting current offerings in the West as well as attracting new buyers from developed nations.” (Petrick and Juntiwasarakij 2011, p. 24) Throughout the literature review, the topic of creating new offerings for developing markets was increasingly cited. It was shared that these new offerings would typically incorporate higher value at a lower price point, ultimately establishing an entirely new value offering for the developing market consumer. Due the offering’s unique, low cost - high value attributes, when eventually

introduced into an advanced market it may stand well above existing offerings, providing entirely new value also to the advanced market consumer.

Petrick and Juntiwasarakij (2011) state, “Value, in emerging markets, means reducing products and services to their essence. Products have to meet the needs of the consumer and work reliably in challenging environments.” (p. 27) On the other hand, when introducing these innovations into advanced markets, they may provide new value to the lower-end of the market, potentially even being disruptive, as no other similar solution may exist at that time for that specific market. (Sinha 2013, p. 70)

Evaluation of New Value Proposition

Since it was established that the Elephant Tap had not yet entered the action point of market introduction, it is not possible to draw reliable conclusions on whether the Elephant Tap in fact would offer new value to both a developing market consumer, in Uganda, and a advanced market consumer potentially in Finland. Therefore, it is only possible to predict what new value the tap would offer to these markets. The following analysis will be based under the assumption that the tap would be primarily introduced in Uganda and subsequently introduced in Finland and it would offer new value to both markets.

Based on information provided previously in this analysis and in the Case Study, the intended value of the Elephant Tap would be that it is educational (relevant for the school environment), it is difficult to steal and break but easy to maintain, it saves water, and to an extent helps to save children’s lives since it encourages hand washing and prevents recontamination of hands. Based on the thorough analysis of the needs in the local Ugandan context, if the Elephant Tap continues development based on above-mentioned qualities, it can be assumed that these will collectively present an entirely new value offering. It not only will address identified needs, but it will also provide a solution that doesn’t exist yet on the market.

Considering the potential introduction of the Elephant Tap to Finland or a similar advanced market, assumptions will be made based on the following points made in literature:

As it has been established that the Elephant Tap is a frugal innovation, and literature shares that “frugal innovations...are typically more closely tailored to their emerging market use environments [as compared to cost and good-enough innovations]...Frequently, the frugal value proposition is unique to the emerging market.” (Zeschky et al. 2014b, p. 26) According to Hart (2014) during the second half of the reverse innovation process when innovations are brought back into advanced countries, this phase typically requires frugal designs to be modified to appeal to the rich world consumers. He points out that there may not be many innovations that can flow from bottom of the pyramid to the top without undergoing alterations. (p. 1) Govindarajan (2009) also states that, “Multinationals complete the reverse innovation process by taking the innovations originally chartered for poor countries, adapting them, and scaling them up for worldwide use.” (p. 1)

Therefore, when looking at the potential for the Elephant Tap to bring new value into Finland the structural elements will not be considered as they are especially significant to the context of Uganda. However, two intangible key offerings of the Elephant Tap that might bring value to children (or another specified target group) in Finland as well as the Finnish environment are: that it is educational and it saves water. It is fairly common knowledge that children do not proactively wash their hands and therefore they don't spend adequate amounts of time doing so. The educational offering of the tap – being that the water runs for the proper amount of time that one should wash his/her hands – will be able to teach children and perhaps make it a habit for them wash their hands for the correct amount of time. Also, the element of saving water that the tap offers is valuable as well. It is also common knowledge that water is being wasted in colossal amounts worldwide. If the tap for the Finnish market could be designed to save water in an attractive manner to the user, it may prove extremely valuable to the environment. Thus, this analysis is suggesting that if the Elephant Tap were to be undergo alterations after being introduced to the Ugandan market and reversed into an advanced market –

potentially Finland – it may be able to offer a unique educational and environmentally-friendly new value proposition.

After the entire analysis of the Case Study utilizing the proposed theoretical framework it can be concluded that the resource-constrained initiative, carried out between UNICEF and academia creating the Elephant Tap has not completed the reverse innovation process. Although each of the action points of the reverse innovation process up until product development have been adopted thus far, the initiative will remain a frugal innovation initiative unless a version of the Elephant Tap is eventually introduced to a developed country market.

Referring back to the theoretical framework, the process around the Elephant Tap did go through the initial established action points of LGT formation, needs (gap) assessment, concept ideation, and product development while incorporating a clean-slate approach, but it has not yet been introduced to the primary or secondary markets. Based on the findings through the analysis, the Elephant Tap predominantly went through an A-D-A-D- (?) - (?) flow of innovation. Based on the assumptions made of how the progression of the Elephant Tap will continue, it can be anticipated that the Elephant Tap will ultimately be carried out as A-D-A-D-D-A. If this is the case, then the reversal of innovation will occur upon introduction into the advanced market and this process will be considered a strong reverse innovation, as opposed to a weak initiative. Although the value that the Elephant Tap could provide was established, it could not be concluded what new value offering it would provide to each market as this stage of the reverse innovation process had not been reached.

As there is not an existing method to determine which market the different action points of the Elephant Tap predominantly took place in, there was not a concrete method utilized to define this through the analysis. Instead, conclusions were made based on an understanding of where the bulk of the efforts took place – based on experience in the initiative.

This section addresses Research Question 2 by answering: Can a frugal innovation initiative that is carried out collaboratively evolve into a process of reverse innovation?

The findings from this section reveal that a frugal innovation initiative can in fact be carried out collaboratively and become a process of innovation, under certain conditions. Private sector must be involved in the initiative, as they will ultimately play a role in introducing the output to the primary market as well as be responsible for the reversal of the innovation to introduce it into an advanced country from a developing country. Also, either the LGT should be based full-time in the developing country or one of the partners should be based there full-time in the case that the LGT may move between advanced and developing country, as what occurred in the Case Study. As the time spent in each action point may be shared between the advanced country and developing country, it will be necessary that a bulk of each action point is spent predominately in one of the markets. Ultimately, the sequence of the markets that exhibit the bulk of the work would need to match one of the 10 proposed flows of reverse innovation. In other words, as it was established that the bulk of each action point related to the Elephant Tap led to A-D-A-D and it was assumed that the final two action points would be D and subsequently A – establishing a flow of A-D-A-D-D-A – this confirms the potential for a process of reverse innovation as specifically the last 4 action points of A-D-D-A are accepted as the strong flow of reverse innovation, specifically coined as ‘Developing Country Spillover’.

The following section will address Research Question 3a, describing which elements will need to be considered in order for UNICEF (or a related IDO), academia, and private sector to carry out reverse innovation collaboratively.

5.3. Collaboration of an International Development Organization (IDO), Academia, and Private Sector in Reverse Innovation

This section will address Research Question 3a: How and why might UNICEF (or a related IDO), academia, and advanced country private sector carry out reverse innovation collaboratively? First, this section will briefly introduce ‘The Why’ – the literature on collaboration in developing countries and the benefits of collaborating in the context of the Case Study. Then ‘The How’ will be discussed – an adapted version of the theoretical

framework will be shared, specifically pertaining to collaborating in the process of reverse innovation in the context of the case study.

A collaborative, resource-constrained initiative such as the one presented in the Case Study of this thesis proves very useful in the commencement of research to discover why and how collaborative initiatives could engage in reverse innovation. Although von Zedtwitz et al. (2014) claim, “Given the multilateral collaboration in such innovation projects, we suspect they would not qualify as reverse innovation” (p. 13), this thesis explores otherwise.

Traditional views in literature may focus on models for MNCs to single-handedly employ when approaching developing countries to generate economic value – proven also in literature concerning reverse innovation. However, there are several authors (Prahalad 2010, Van Dijk and Sandee 2002, and Dahan et al. 2010) who propose a different approach. They address the idea of constructing new business models or ecosystems in developing countries. These collaborative networks would consist of businesses, local development organizations, as well as universities, and other partners to work together and develop entirely new products and services. As a collective, they would help to establish viable business practices as well as general new economic and/or social value to both consumers and the partners involved. Not only that, but also the knowledge and skillsets that would unite within this ecosystem would be difficult to come across in any other manner. Thus, it is proposed that collaborating would prove much more valuable than taking a solitary path to developing countries.

It is evident that a collaborative initiative between an IDO, private sector, and other relevant institutions such as academia proves very fertile in the context of developing markets. Compared to extant literature on how MNCs should engage in reverse innovation, the collaborative initiative introduces a new approach to how such actors can engage in an innovation initiative that may evolve into a process of reverse innovation. The benefits that these actors may bring and/or receive through collaborating will now be discussed.

Academia, specifically Aalto University, will benefit from the collaboration as staff and students will gain experience into the unique process of frugal design, development, and innovation. Makerere University staff and students will benefit from joining forces, as they will not only have the opportunity to have a positive impact on their society but also to share and disperse their local knowledge and utilize it for the benefit of Uganda. Through meetings it was discovered that Makerere University has conducted immense amounts of research that simply has not been published; they could utilize this built up information to positively impact the progress of the collaboration.

UNICEF Finland and UNICEF Uganda discussed that involving academia allows for greater focus and achievement in the needs assessment stage as well as the evaluation of products that are in the development stage. It is very useful for students to be incorporated into the work, as they do not maintain a dominant logic of the field. It was even proven that the students were able to extract information from the field that UNICEF was not yet aware of. This could be due to the fact that the community may have a different response to a project team of mixed foreign and local students as opposed to a group of UNICEF employees showing up with “their uniforms” on. In regards to collaborating with private sector, UNICEF Finland believes that by involving private sector it will allow for the transfer of innovations into sustainable, commercially viable results. UNICEF Uganda representatives addressed that collaborating will influence private sector to change the way they do business. As UNICEF Uganda has recently been mapping the private sector in Kampala for future collaboration possibilities, this initiative will prove to be a beneficial case example for them. Wholly, UNICEF is confident that they can help companies to better understand the local environment, as foreign company representatives rarely interact with the local community – businessmen will simply visit Uganda to sit in meetings without experiencing the context.

Private sector will profit from the collaboration not only through gaining a thorough understanding of how the Ugandan market operates but also through opening up opportunities for future business. Through collaborating in this type of initiative, they may additionally save on investment and will benefit from the R&D carried out by the students. However, it will be critical for companies to not expect the business opportunity

to be handed to them. Rather, they need to become involved in earlier stages, go to Uganda and work together alongside UNICEF and other stakeholders. It is especially important for UNICEF – based on the respect that they have from communities and trusted work ethics – to carefully screen members from private sector who are interested in getting involved in such a collaboration. The predominate reason why UNICEF agreed to incorporate Biolan as private sector into the partnership was because the company maintains good, strong values.

In the end, all partners may benefit from the sharing each other's immeasurable experience and the new knowledge they each will personally develop. This initiative will certainly stand as a pioneering model for future, similar initiatives.

After establishing why collaboration should occur in developing countries, we will now discuss *how* this could happen in the process of reverse innovation.

It has been established that if the Elephant Tap is eventually introduced to an advanced market – assuming that it will be introduced to the Ugandan market according to plan – then it could be considered a reverse innovation initiative. This is based on the fact that it proved to perform in each of the action points mentioned up until product development, it also began with an A-D-D-A innovation flow which is present in the framework, and fulfilled the outputs described.

It is essential to establish, due to the nature of the collaboration, that without partnering with private sector, the probability of the Elephant Tap – or any other solutions for that matter – to undergo the reversal process and ultimately be introduced into an advanced country, is slim. From the beginning of the collaboration, it was never mentioned that the outputs might subsequently be brought into advanced markets; Uganda was the only target market in question and any other developing markets in which UNICEF engaged were most likely to be the only other subsequent markets to which the outputs would be introduced. Hence, the involvement of private sector into the collaboration sparked the potential for reverse innovation to occur. The question arises however, when is it appropriate to involve private sector for reverse innovation to occur in the case of a collaborative initiative that begins between such players as an IDO and academia?

Reflecting on the fact that it would be beneficial for private sector to become involved early in the initiative and considering the greatest issues in the evolvement of the Elephant Tap came during the action point of product development it could be suggested, that in order to sidestep difficulties in the development process, private sector should begin involvement during the concept ideation stage, or earlier.

Based on the analysis from the previous section 5.2. as well as on the preceding information provided on collaborative initiatives in developing countries, an adapted model of the theoretical framework will further be presented. This model will be applicable for the collaboration of UNICEF (or a similar IDO), academia, and advanced country private sector in the process of reverse innovation.

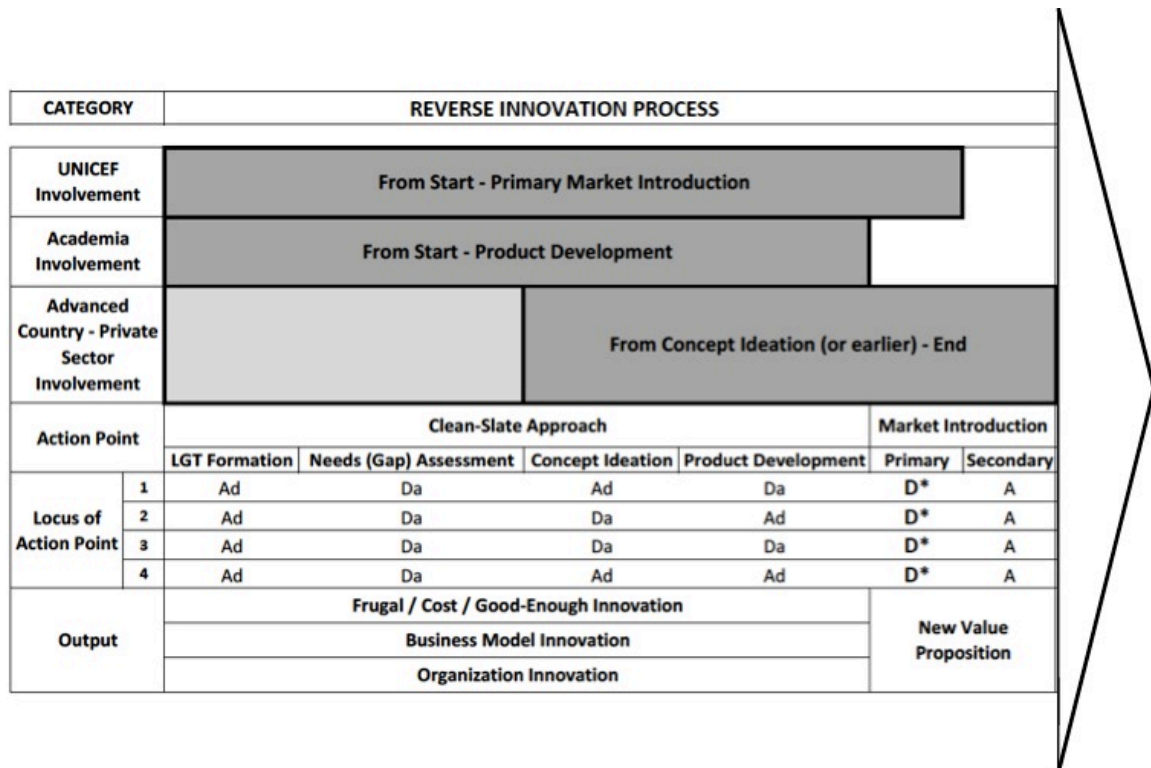


Figure 6: Framework - Collaboration between UNICEF, academia, and advanced country private sector in the process of reverse innovation

Key:

Locus of Action Point 1 – Considered a ‘Developing Country Spillover’ (Corsi, 2012) as the product life cycle from Concept Ideation to Secondary Market Introduction predominantly follows the A-D-D-A

innovation flow. As at least three out of all Action Points take place in a developing country this flow can be considered a strong reverse innovation.

Locus of Action Point 2 – Considered a ‘Double Reverse Innovation’ (Corsi, 2012) as the product life cycle from Concept Ideation to Secondary Market Introduction predominantly follows the D-A-D-A innovation flow. As at least three out of all key Action Points take place in a developing country this flow can be considered a strong reverse innovation.

Locus of Action Point 3 – Considered a ‘Reversed Product Life Cycle’ (Corsi, 2012) as the product life cycle from Concept Ideation to Secondary Market Introduction predominantly follows the D-D-D-A innovation flow. As at least three out of all Action Points take place in a developing country this flow can be considered a strong reverse innovation.

Locus of Action Point 4 – Considered a ‘Spill-Back Innovation’ (Corsi, 2012) as the product life cycle from Concept Ideation to Secondary Market Introduction predominantly follows the A-A-D-A innovation flow. As less than three out of all Action Points take place in a developing country this flow can be considered a weak reverse innovation.

A – Advanced (Developed) Markets

D – Developing Markets

Ad – Mainly in Advanced (Developed) Market, slightly in Developing Market

Da – Mainly in Developing Market, slightly in Advanced Market

D - Second round of needs assessment for the Advance Market followed by the reversal point of the innovation from Developing to Advanced Market.*

Grey-shaded row (in Involvement) – Signifies which Action Points the stakeholder could take part in

This model assumes the position that UNICEF, academia, and advanced country private sector would collaborate to engage in a reverse innovation process. The adaptation first incorporates the points of involvement of the key stakeholders. From the model, it can be seen that UNICEF - or a related international development organization - should participate from the beginning of the process up until the solution is introduced in the primary market. Academia should take place from the beginning of the process until the product is ready to be introduced to the primary market. Advanced country private sector should become involved in the collaboration at latest by the concept ideation stage, but could get involved earlier. They would then stay involved through to the secondary

market introduction, ultimately being the key player in reversing the innovation to an advanced country.

This model does not cover if and when a developing country SME might join into the process, especially in order to play a part in developing market introduction. In the context of the presented model, as the developing market SMEs would potentially benefit most from new business opportunities, it could be assumed that they may join in during the product development stage and stay involved into the primary market introduction phase. However, if relevant SMEs would be encountered towards the beginning of the reverse innovation process, it would be recommended to involve them from a distance, by keeping them up-to-date on the progress but only directly involving them in later stages. This is based on evidence from the Case Study, which proves that the more key stakeholders there are, the more disorderly it may become. Although collaboration proves to be beneficial in developing countries, at the start of the initiative it's best to focus by involving fewer stakeholders and evolve gradually by welcoming relevant players when time is right.

The model narrows down the amount of flows of reverse innovation from the original 10 presented in the model of Corsi (2012), to 4 flows of reverse innovation – or as labeled in the model 'Locus of Action Point'. The flows of reverse innovation were narrowed down specifically to these four as it was found that they most closely related to the type of collaborative initiative at hand. As the plan is to initially introduce the Elephant Tap to the Ugandan market, the flows of reverse innovation that pinpointed developing country as the primary market of introduction were chosen for this model. This can be seen in each flow, as there is a bolded 'D*' that indicates the point of reversal happening first from the developing country and subsequently to the advanced. This model proposes that for similar types of initiatives that carry out frugal innovation to primarily introduce a solution to a developing market context before subsequently introducing the solution to an advanced market, only these four flows of reverse innovation would be applicable. There are, however, four additional flows of global innovation presented by Corsi (2012), which involve primarily introducing a solution to a developing market (A-A-D-D; A-D-D-D; D-A-D-D; D-D-D-D). Nevertheless, they have not been included in the model as

the model displays qualifications for the process of reverse innovation and these four additional flows are not cases of reverse innovation since subsequent advanced market introduction does not occur within them.

The adapted model also incorporates the primary differentiating factor that stood out specifically in the locus of the action point when comparing a traditional case of reverse innovation to that of the Case Study. This differentiating factor was that the locale of the phase of innovation was not always entirely carried out in one location. Even though through the Case it was clear where a greater amount of the work pertaining to a certain action point was carried out, it was often evident that part of the work of the action point had also slightly been carried out in the opposite market. Therefore, in the presented model the locus of each action point, except for those in market introduction, are represented as ‘Da’ or ‘Ad’ – the capital letter representing which market the action point is predominantly carried out and the lower case letter signifying that the action point was also slightly carried out in the other market. As von Zedtwitz et al. (2014) explain, “Most new product development projects are still conducted in one location or in one country only, and even when several countries are involved, the leadership and the lion’s share of the work usually resides in one location.” (p 13)

This section addressed Research Question 3a by answering: How and why might UNICEF (or a related IDO), academia, and advanced market private sector carry out reverse innovation collaboratively? Extant literature in recent years as well as empirical research related to the Case Study first explained the benefits, especially the economic and social value, that could be gained through collaborating on work in developing countries. It was concluded that each partner addressed – academia, UNICEF, and private sector – would gain more value through collaborating rather than trying to carry out such an initiative alone. In terms of how might this type of collaboration be carried out to successfully achieve a process of reverse innovation, a model was presented that displays at which points each key partner should be involved during the process. The model also identifies the four most applicable types of reverse innovation flow to this context, which ultimately plan to initially introduce a solution into the developing market before introducing it to an advanced market. In these flows of innovation, the model considers

the high likelihood of such an initiative to have related innovation efforts occurring almost simultaneously in developing and advanced countries during each Action Point.

The next section will discuss what factors should be taken into consideration when planning to collaborate on an innovation initiative in the Ugandan context.

5.4. Collaboration and Innovation in Uganda

This section will address Research Question 3b: What should be taken into consideration when setting up a collaboration and innovation initiative for the context of Uganda?

Setting up a collaborative initiative

Raising additional factors into the equation, which may need to occur relating to setting up the collaboration before the reverse innovation process begins, Kreiner and Schultz (1993) and George and Farris (1999) as cited in Bossink (2002), “describe the development of co-innovation strategies in dynamic networks of organizations as a process with distinctive stages...[they] distinguish three stages: (1) discovery, (2) explorations of collaborative opportunities, and (3) crystallization of collaborative relations.” (p. 313) This can be compared to the beginning of the Case Study, when establishment of the collaboration developed over one year, prior to the formation of the first project team.

Looking more closely into the actions that should be taken when first setting up collaboration, based on findings from the Case Study, personal involvement, and conversations with key stakeholders related to the collaboration, the following suggestions will be recommended (in random order):

Setting up a collaborative initiative for reverse innovation

1. Building a relationship will take time – prepare for that;

2. Choose specific individuals to set up the collaboration who have sufficient experience and skills in preparing agreements between partners;
3. Agree on mutual goals and ethics;
4. Establish concrete roles and responsibilities, especially concerning a main coordinator and which partner will be the driver or ‘headquarters’ of the initiative;
5. Clearly communicate assumptions and expectations to every stakeholder, transparency is key;
6. Establish a common language and understanding of critical terms (i.e. innovation, implementation, etc.);
7. Agree on formal communication channels (i.e. workshops, meetings) and keep in mind that communications channels such as Skype which require reliable internet connection, may not always be the best choice when working in developing markets;
8. Develop an understanding of each other’s schedules and agree on time commitment;
9. Develop a thorough understanding of the organizational culture of each key stakeholder;
10. Carry out contextual coaching including anthropological workshops focused on the context, to provide guidance for fieldwork;
11. Determine who will gain the intellectual property rights or if the solution will be open source;
12. Plan to keep the size of the LGT small, to use time efficiently

These recommendations concern what should be established before the start of the reverse innovation process when setting up a collaborative initiative. In the following section, guidelines to innovating in the context of Uganda will be produced.

Innovation in the Ugandan context

The following information has been both extracted from the lessons learned through the Case Study, as well as from the research journal produced through meetings and

conversations carried out during the course of the Case Study collaboration. In addition to meetings held with primary stakeholders, there were additional meetings with Ugandan entrepreneurs, the Ugandan Investment Authority, the General Consul of Finland in Uganda, non-profit organizations, an incubation hub, as well as representatives from the business sector in Uganda.

Existing literature has addressed reverse innovation predominately in the context of emerging markets such as China and India. This thesis would like to add on to literature by sharing insight from what is relevant to consider when carrying out reverse innovation efforts in Uganda. Specifically, a suggested model for conducting the needs assessment through to the product development action points in Uganda will be introduced. Adding on to the information provided earlier on Uganda, in section 3.1, the model and background information on Uganda will be relevant for firms or institutions looking to immerse themselves into the Ugandan context as a part of the reverse innovation process.

From Needs Assessment to Product Development in Uganda

1a. Identify a local Ugandan champion

It is necessary to have a contact in Uganda when you first arrive. Both prior to and upon initial entrance into Uganda, it is important to first pinpoint an individual(s) who appreciates and understands the type of work you are looking to carry out. This person(s) will both help introduce you to the Ugandan context as well as be able to serve as “the local face” of your solution in Uganda.

1b. Identify with the Ugandan Investment Authority

They can help as a type of ‘travel agency’ for surveying the market. They can help you to connect with local partners and they have a database for Ugandan businesses that are interested in partnerships. In order to get a work permit in Uganda you need to first get an investment license. They: 1. License projects, 2. Manage industrial parks (in and out of Kampala), 3. Provide business advisory services, 4. Help investors acquire secondary licenses.

Local partners can alternatively be met through utilizing existing networks, attending local networking events, and exploring other organizations that are working in the same community that you wish to work in.

2. Contextualize the problem

Either plan to go and observe in a specific community or conduct a study with a focus group. Remember to approach every situation with an open mind and always anticipate that everything will take longer than you may have planned.

3. Identify the local gatekeeper (through conversation and observation)

Communities are very oriented towards religion, so the gatekeeper may be found here. Otherwise, go to visit the sub-county where you can talk with a community officer and the sub-county chief, and they can help you to pinpoint the gatekeeper. With this gatekeeper, you can go into the community and he/she will give you a noteworthy introduction. Being a local, this gatekeeper will be able to break through boundaries of any communication problems or worries concerning obtaining legitimate information.

4. Observe, understand, and identify

Once in the community or working with a focus group, observe to discover the need and the magnitude of the problem, understand the impact that your work will have, and identify if the problem is resolved, what value will it add to the community? And remember to involve local people in your team, like the ‘local Ugandan champions’ that you initially identified.

5. Create a prototype

Based on the information you have collected, play with the information to create examples of concrete solutions.

6. Feedback loop

Get a sample (prototype) and revisit the same community or the user group to test it. Have the introduction of the sample carried out by a reliable person – perhaps the same gatekeeper. When introducing the sample to them, discuss its affordability and potential

means of payment. It is important to have someone reliable or familiar giving the introduction of the sample, as sometimes people will be suspicious of new solutions. They will embrace further educational aspects of the sample; if there is information taught to them in connection with the solution that would be of value to them, this will be a promising factor to the success of the solution. Using the feedback loop method will allow for greater product recognition within the community as well as a feeling of ownership within the community as they will feel a part of the process from beginning until end. Ultimately, there must be someone or a group of stakeholders who should gain a mentality of ownership over the said solution and be educated in its upkeep in order to keep it maintained.

This section addressed Research Question 3b by offering two different guidelines for the question: What should be taken into consideration when setting up a collaboration and innovation initiative for the context of Uganda? Before engaging in a collaborative process of reverse innovation the terms, conditions, and goals of the collaboration itself need to be established. 12 steps were provided as a guide to setting up the collaboration. Additionally, even though every developing country may display similar needs problems, it is crucial to not assume that the process from needs assessment through to product development would be the same for each country. Therefore, a model was provided, dedicated to innovating in the context of Uganda. Combined, both of these models set the foundation for a successful collaboration and process of reverse innovation in the Ugandan context.

6.0 CONCLUSION

The previous section presented a thorough discussion and analysis of this study. The conclusions of this thesis will now be presented throughout the following five segments. A restatement of the purpose of the research will first be presented followed by a summary of the key findings. Next, the theoretical implications of this study will be discussed. Fourth, the managerial implications of this study will be offered. Lastly, suggestions will be made for future research.

6.1. Purpose of Thesis

The purpose of this thesis was to establish the increasing importance of reverse innovation and explore the possibility of carrying out reverse innovation collaboratively. The topic of the thesis was derived from the author's personal involvement over the course of 2.5 years in an ongoing collaborative initiative.

Once the author embarked on the research related to reverse innovation, it became clear that the potential to carry out reverse innovation collaboratively had not yet been published in literature. As existing literature only focuses on strategic implications for MNCs when engaging in reverse innovation independently, this thesis wanted to explore the possibility of different stakeholders carrying out the reverse innovation process collaboratively. This is especially relevant as there is an increasing amount of literature sharing the benefits of collaborating in developing countries as opposed to approaching developing countries individually for innovation initiatives.

In order to start building a foundation to understand the phenomenon of reverse innovation, a review of literature pertaining to both innovation and collaboration in developing countries was first carried out and then deep focus was brought into the phenomenon of reverse innovation. As it was discovered that a framework did not yet exist in literature, which systematically explains the process of reverse innovation, the

literature review was utilized to produce a framework that displays the elements of the process of reverse innovation from start to end. This framework was then used to examine the case study of an ongoing collaborative initiative between UNICEF (as an international development organization), academia, and advanced country private sector in the context of the developing country, Uganda. Findings from the case study were utilized to produce an adapted framework to offer a process for carrying out reverse innovation collaboratively. Empirical data was further employed to share a model of setting up a collaborative initiative as well as a model for innovating in the context of Uganda.

6.2. Summary of Key Findings

As reviewed in section 4.3 of the Methodology, the findings were subject to various assumptions due to the young nature of the phenomenon of reverse innovation and the novelty of the idea of carrying out reverse innovation collaboratively.

In order to fulfill the first objective of the research, extant literature was reviewed to develop an understanding of the theories and principles underlying the process of reverse innovation. Ultimately a theoretical framework was presented, predominantly built off of the work of Corsi (2012), von Zedtwitz et al. (2014), Govindarajan and Trimble (2012), and Zeschky et al. (2014). The framework encompassed a detailed explanation of the elements necessary to take part in the process of reverse innovation. Starting off with establishing the main action points of reverse innovation, the framework identified the following in a linear model: local growth team (LGT) formation, needs (gap) assessment, concept ideation, product development, primary market introduction, and secondary market introduction. The first 4 steps would all be carried out under a clean-slate approach to innovation. The next section of the framework, the ‘Locus of Action Point’ built upon a model offered by Corsi (2012) by sharing the 10 different flows of reverse innovation, both weak and strong examples of reverse innovation depending on how much of the process was carried out in the developing country – strong reverse

innovation being the process with more of its key innovation phases focused in a developing country. Each of the 10 flows of reverse innovation were divided into 6 parts and given a locus of either advanced 'A' or developing 'D' country for each point, corresponding to where the specific Action Point took place. Finally, the last section of the model shared the outputs over the course of the reverse innovation process, corresponding to the Action Points. Prior to the Action Points of market introduction, it was determined that the outputs would be either frugal/cost/or good-enough innovation along with business model innovation and organization innovation. Once the process of reverse innovation reached the stages of primary and secondary market introduction, it was determined that a new value proposition would be the output for each market.

This framework was utilized as a sifter to examine data presented in the case study. This was done to determine whether the collaborative initiative depicted in the case study exhibited elements of the reverse innovation process. The intention was to explore whether reverse innovation could potentially be carried out collaboratively. The findings revealed the answer to the second research question that is in fact possible for reverse innovations to be carried out collaboratively, under certain circumstances. Private sector must be involved in the collaboration and one of the partners should be based full-time in the developing country. As it is expected that the innovation will be carried out concurrently in both an advanced and developing country, it will be necessary that a bulk of each phase of the reverse innovation process is spent predominantly in one of the markets. Ultimately, the sequence of the markets that exhibit the bulk of the work would also need to match one of the four relevant flows of reverse innovation, presented in Figure 6.

Based on these findings, in order to answer the third research question it was first established why might UNICEF, academia, and advanced country private sector carry out reverse innovation collaboratively. It was proven that not only is collaboration is beneficial in the context of developing countries but it is specifically beneficial to each stakeholder involved in this collaboration. UNICEF would benefit from R&D carried out by academia and have private sector implement the solutions sustainably. Academia would benefit from the new knowledge on frugal innovation processes and the ability to

utilize existing research for great impact. Private sector would benefit from a noteworthy introduction to the developing market (of Uganda specifically) and new business opportunities that it would open up for the firm. In the end, all partners may benefit from the sharing each other's valuable backgrounds of expertise and the new knowledge they each will personally develop.

In order to subsequently answer how might these players carry out reverse innovation collaboratively, an adapted framework was proposed specifically pertaining to a collaborative process of reverse innovation involving the stakeholders of UNICEF, academia, and advanced country private sector. This framework presented when each stakeholder should be involved along the course of the process, corresponding to the Action Points. Also, the flows of reverse innovation were narrowed down from the 10 original flows down to 4, which most closely related to the flow of innovation that would need to occur in this type of collaboration in order for it to be established as a reverse innovation initiative. In these 4 proposed flows of reverse innovation it was further proposed that instead of the locus of each Action Point specifically residing in either an advanced or developed country – as innovation would typically be carried out concurrently in this type of collaboration – the locus of innovation would be determined as predominately occurring in one of the markets and slightly occurring in the other market.

Additionally, it could also be claimed that that this adapted framework offers a link between frugal innovation and reverse innovation. As the collaborative initiative of the case study was proven to be a frugal innovation initiative and a framework was provided showing out this initiative could carry out a process of reverse innovation, it subtly provided a means to understand the four different flows of innovation that could take place in order for a related frugal innovation initiative to become a reverse innovation.

Furthermore, to answer the final research question empirical research both from the case study and from meetings and conversations carried out when primarily involved in the collaboration, two models were offered to compliment the adapted framework for collaboratively carrying out reverse innovation. First, a 12-step model was provided listing crucial points to employ when setting up a collaboration for such an initiative.

Second, a 6-step model was presented on how to approach the innovation process in the context of Uganda. Specifically, this corresponded to the Action Points from needs (gap) assessment to product development.

6.3. Contributions to Literature

The findings both add on to existing knowledge of reverse innovation and counter-claim assumptions made that presume a multilateral innovation initiative may not lead to reverse innovation.

Existing research on reverse innovation only attempts to define reverse innovation and discuss it in the context of MNCs regarding how it can be put into action. Since the phenomenon of reverse innovation is so young, the theory utilized for the scope of this research was adopted from the main elements of reverse innovation extracted from existing literature and formed into a chronological framework of the reverse innovation process. The main elements were predominantly borrowed from the views of Govindarajan and Trimble (2012), Corsi (2012), von Zedtwitz et al. (2014), and Zeschky et al. (2014). Thus, a framework was proposed for the process of reverse innovation, including elements outside of purely the product life cycle. This detailed framework adds on to the more simple models of reverse innovation addressed in literature. The study also further addresses the idea of carrying out reverse innovation collaboratively.

The thesis goes on to further counterclaim assumptions made specifically by Corsi (2012) and von Zedtwitz et al (2014). After sharing their model of global innovation flows, particularly which flows of global innovation are constituted as flows of reverse innovation, these authors claim that multilateral collaborating in multinational innovation projects would not be classified as reverse innovation. By establishing the value of collaborating on projects in developing countries and assessing whether the case study's collaboration can carry out reverse innovation, it was concluded that it is in fact possible to do so. Not only were the authors counterclaimed but also a new framework was

proposed to how reverse innovation could be carried out collaboratively between UNICEF, academia, and advanced country private sector.

Additionally, as the collaboration in the case study proved to have first been a frugal innovation initiative and later developed the potential to become a process reverse innovation this may add on to existing literature of frugal innovation and serve as a link between processes of frugal and reverse innovation.

Furthermore, this may add on to literature pertaining to both reverse innovation and Uganda, as this was an entirely new type of case study carried out in the Ugandan context. Previous studies in reverse innovation predominantly focused on, but were not limited to, the contexts of India or China.

6.4. Managerial Implications

One of the main goals of this thesis was to address the subject of whether reverse innovation can be carried out collaboratively. As discovered through existing literature, managers of MNCs have been provided with one general route to carrying out reverse innovation individually; the possibility of carrying out reverse innovation collaboratively had not been presented.

The findings of this study suggest that managers should explore the option of collaboratively carrying out reverse innovation because not only is it possible but collaborating in developing market projects also proves to offer value to each stakeholder involved.

The adapted framework in Figure 6 provides one way in which managers could engage in a collaborative reverse innovation process, through combining the stakeholders of UNICEF (or a related international development organization), academia, and advanced market private sector. This specific process would first have the aim of establishing a frugal innovation, hence first introducing an innovation to the developing market, before completing a process of reverse innovation by subsequently introducing the innovation to

an advanced market. The framework implies when each stakeholder should become involved in the reverse innovation process. Within the established action points of the process, the framework also identifies the four key formulations of the flow of innovation, when transitioning between advanced and developing country. In the case of first emitting a frugal innovation, these four are the only flows of innovation that can be classified as reverse innovation processes.

Furthermore, two models were provided that would benefit management in setting up a collaboration. A 12-point criteria was offered and it is suggested that management takes time and gives proper attention to set up such an initiative in order to avoid misunderstandings or complications during the reverse innovation process. Although setting up and engaging in such a collaborative initiative may not be as efficient as compared to carrying it out alone, findings suggested that collaboration would ultimately prove to offer great economic and social value.

Additionally provided was a 6-step model for managers to employ when innovating specifically in the context of Uganda. Although developing countries may exhibit similar characteristics, they have very unique cultures with communities that have specific needs and acceptable means of discovering and addressing these needs. It should not be assumed that just because something is confirmed to work in one developing country, it would work just as well in another similar country. Instead, each developing market should be viewed individually and a unique process or a solution should be adapted to the context. The 6-step model for Uganda explained how managers should approach the innovation process in Uganda between the action points of needs (gap) assessment to product development.

6.5. Suggestions for Future Research

As indicated numerous times throughout this study, there are clear gaps in existing theory on reverse innovation. Many points were introduced which opened up possibilities for future research. This section will address these suggestions for future research.

The initial theoretical framework presented in the thesis for the process of reverse innovation, adds on to existing literature by providing a relatively generic model that allows for it to be applied in the context of MNCs. However, the adapted framework presented is only directly applicable to a frugal innovation initiative and collaboration between UNICEF (or a related international development organization), academia, and private sector. If further research were to be carried out on collaborative reverse innovation, examination of a few different cases would be suggested. First, according to the theoretical framework, aside from frugal innovation either cost or good-enough innovations can be involved in the reverse innovation process. Therefore, collaborative cases exhibiting either-or could be assessed. Furthermore, research on collaborative initiatives involving different combinations of parties should also be carried out to explore what types of other partnerships could potentially work towards reverse innovation. Additionally, it is recommended that further research be carried out on initiatives closely related to that of which was presented in the case study to either support or counterclaim the assumptions and results established in the thesis.

As the author did not have a tool for assessing in which country the bulk of each Action Point was carried out, some may argue that the assumptions made were not credible. Therefore, in future research that encompasses such multilateral innovation initiatives, it would be suggested that a tool be developed in order to accurately measure where the work related to the development of the innovation was predominantly carried out.

Furthermore, as it became evident that SMEs – specifically local Ugandan SMEs – would become involved in the continuing collaboration, it could be suggested that a future researcher explores at which point during the collaborative reverse innovation process it would be best to involve the SMEs. Although in the Discussion and Analysis it was suggested the SMEs take part in the product development and primary introduction phase, related to the proposed model in Figure 6, this needs to be further tested based on proof instead of assumptions as the author did not have evidence in the case study to base her assumptions on. To add on to this, it could further be suggested that a complimenting study be carried out either during or after the continuing 3-year collaboration comes to an end. This will especially be relevant once the fate of the Elephant Tap is determined.

Finally, when dividing up countries into purely advanced or developing country, the framework did not specifically address the different classification of developing countries. Future research could explore whether differences arise when carrying out reverse innovation in a market classified for instance as an emerging market as compared to a market considered to be in the Bottom of the Pyramid. Additionally, as the country of Uganda was focused on in this study, reverse innovation initiatives could be further explored in the context of different developing markets worldwide as existing research appears to mostly focus on that of either China or India. Research on the above mentioned points could both be carried out for purely the process of reverse innovation as well as a collaborative initiative working towards reverse innovation. Furthermore, within the classification of different developing markets it could be explored whether a similar type of reverse innovation initiative could occur, for instance with a solution being produced in a BOP market and then into an emerging market. However, based on the accepted idea of reverse innovation being that the solution is subsequently introduced into an advanced market, the concept of reverse innovation may not be applicable solely between different types of developing countries.

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APPENDIX

Appendix 1: Reverse Innovations in the Strong and Weak Sense

Strong Reverse Innovation

DADA (Double Reverse Innovation) – “With two reversals in the flow of innovation: the product is first conceptualized in developing countries, and then developed in advanced countries; it is commercialized first in developing countries and later in advanced countries.” (von Zedtwitz et al. 2014, p. 7)

DDAD (Advanced Country-Targeted Innovation)– “Products are primarily developed for advanced markets before ultimately being reintroduced to developing countries, usually as part of a general globalization of the product.” (p. 8)

DDAA (Developing Country Innovation) – “A product is ideated and developed entirely in a developing country for the purpose of being marketed and sold solely in advanced countries. Often this flow occurs in innovation where the developing country-based innovator has unique know-how or a unique capability that he applies to an advanced country-based customer for local use.” (p. 8)

DDDA (Reverse Product Life Cycle)– “In this reversed product life cycle, innovations are developed and launched almost completely in developing countries first, and subsequently introduced in advanced countries.” (p. 10)

Weak Reverse Innovation

AADA (Spill-Back Innovation) – “A type of innovation that is created and developed in an advanced country specifically targeting an emerging market and eventually spills back to an advanced country.” (von Zedtwitz et al. 2014, p. 10)

ADAA (Cost/Capacity Innovation) – “The innovation targets markets in advanced countries...the R&D effort is led by and carried out in a developing country before the product is commercialized in an advanced country, then a reversal of the traditional innovation flow has occurred.” (p. 10)

ADAD (Reverse Spillover) – Similar to ADAA, this innovation will first target markets in advanced countries, then run the major R&D functions in a developing country, after which it is introduced to the advanced country, then subsequently re-introduced to the developing country “without much adaptation.” (p. 10)

DAAA (Front-End Reverse Innovation) – “Called front-end reverse innovation because of the reversal of the flow happens early, this type of innovation has its origins in a developing country but is completed and commercialized in an advanced country; it is barely distinguishable from more traditional types of innovation.” (p. 10)

DAAD (Developing Country-Inspired Product Life Cycle) – “This developing country-inspired product life cycle is similar to the DAAA flow except that the innovation is ultimately introduced back to a developing country.” (p. 10)