Towards A Subscription Economy: *Digital Transformation Journey of a Traditional Product-Based Company*

Master Thesis

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ABSTRACT

Background: Many organizations have started to embark the journey of digital transformation to reinvent themselves. All businesses need to embrace this transformation to keep in pace with competitors and meet the demands of their customers. This study addresses how to transform the existing business model of a traditional product-based company into a digital service-oriented business model. The study also focusses on the importance of servitization and the sale of product-service packages as subscriptions.

Design/Methodology/Approach: This research is an exploratory holistic qualitative case study**.** The research paper follows a qualitative approach with semi-structured interviews as the primary source of data collection. A bottom-up approach of inducing theory from the collected data is practiced here.

Findings: There are three major findings for this study. (1) Digital transformation paves way to improved customer value propositions, better comprehended today with service-oriented business models. (2) The product-services package sold as subscriptions results in stable revenue as well as better value and relationship with the end customer. (3) The acceptance of technology is less of a barrier in emerging economies, with the possibility of alternative sources of service reception for digital services.

Practical implications: The practicalities of this research can be applied to any existing product-based company trying to incorporate services into their business as part of digital transformation.

Originality/Value: The result of this study sheds light into the digital transformation process of a traditional product-based company. The study also emphasizes on the current trend in service-orientation and opportunities of subscription business. It also highlights how customer value propositions and customer relationship can lead to stable recurring revenues periodically.

ABBREVIATIONS

DF	Digital Farming
BU	Business Unit
VP	Vice President
EVP	Executive Vice President
CEO	Chief Executive Officer
CFO	Chief Financial Officer
AI	Artificial Intelligence
Q2	Quarter 2
S&P	Standard & Poor's
SEI	Subscription Economy Index
B2B	Business to Business
B2C	Business to Customer
IoT	Internet of Things
SaaS	Software as a Service
APAC	Asia Pacific

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1. INTRODUCTION

According to Pierre Nanterme, Accenture CEO, "*Digital is the main reason just over half of the companies on the Fortune 500 have disappeared since the year 2000*".

These companies have vanished as a result of mergers, acquisitions, and bankruptcies (Tzuo, 2018). About 88 percent of the Fortune-level companies have taken important initiatives to transform digitally in the next three years (Gale & Aarons, 2018). To be digital in the core necessitates redesigning the business models. It is required to have a clear digital strategy fostered by the management for digital business model innovation (Kane, Palmer, Phillips, Kiron, Buckley, & Press, 2015).

In the traditional product-based model, companies used to focus on getting products to market and sell as many product units as possible through different distribution channels *(Refer Figure 11)*. They don't really care about the customer at the other end, who buys this product as long as their sales achieved the target. In today's economy, successful companies start with the customer. They try to understand the customer needs, serve them and thus improve their relationship with the end customers (Tzuo, 2018).

This chapter begins with the background (Chapter 1.1) and motivation (Chapter 1.2) of the study to revamp the business model of a traditional product-based company as part of digital transformation. By proceeding along with the chapter, research objectives (Chapter 1.3) and research question (Chapter 1.4) are also defined. This chapter concludes with the thesis structure (Chapter 1.5) providing an overview of the rest of the study.

1.1. Background

We live in the era of Industry 4.0, commonly referred to as the fourth industrial revolution. It alludes to the current trend of automation and data exchange in manufacturing technologies which includes cyber-physical systems, IoT, cloud computing and cognitive computing. Industry 4.0 seems to have a deep impact in the agriculture sector as well (Wikipedia, 2018).

The agriculture industry is no exception to this trend. Studies show that this industry was a laggard in terms of digital transformation for a long time. The digital transformation of

agriculture calls for the need to develop new digital tools and machinery which will help farmers to increase their yield and quality.

To incorporate digital into the business, companies need to reinvent their business model. Nowadays, born-digital start-up firms are exploring new opportunities in e-commerce through innovative business models. Established firms are competing with these start-ups to transform their existing business models to be a digital accommodate (Amit & Zott, 2000).

Being digital enables companies to provide digital services to their customers. This, in turn, marks the starting of another transformation for companies, being digital and service oriented at the same time. At this age of service orientation, it is important for companies to embrace this dual transformation.

By being service oriented, companies place themselves in a position to provide both products and services to customers from a single platform. In the early days of the product-sales model, customers never had the chance to opt for the products. Their choices were very limited. With the advent of the internet, customers have the information they need and hence, the buying power has increased.

With the beginning of digital transformation and service orientation, companies employ digital tools in learning customer behavior; to seek assistance with decision-making processes as well as in collaborating with customers and partners. Digital tools assist companies to learn customer behavior and make decisions out of it (Fjeldstad & Haanæs, 2018). Patterns can also be identified with customer data leading to better services and products (Saarijärvi, Grönroos, & Kuusela, 2014). Today, evaluating customer experiences and business success is the flip sides of the same coin.

According to Tzuo (2018), '*Ownership is dead. Access is the new imperative'*. For example, customers wish to have a ride, rather than a car. By 2020, fifty percent of the business of the corporates will depend on their ability to innovate digitally enhanced products, services, and customer experiences.

With service orientation, most of the companies are transforming towards subscription business. For example, the furniture giant, Ikea will roll out Furniture As A Service (FAAS) in around 30 countries. The furniture rental through subscriptions will offer a circular outcome, cycling back the used materials into the integrated value chain (Thomasson, 2019).

1.2. Motivation

My experience as a Senior Enterprise Solution Developer in my previous company, UST-Global and pursuing Master's in Innovation and Entrepreneurship course led me to choose a thesis subject which is at the intersection of both technical and business. I noticed the digital transformation that is sweeping through the traditional industry such as agriculture particularly interesting. At my own initiative, I found that Yara International ASA, one of the biggest fertilizer company in the world has already started embracing digital transformation with their Digital Farming initiative. I pitched my thesis idea to Yara International ASA and was also offered an internship position in their Digital Farming business unit. This study is done in collaboration with Yara International ASA and the report will also be submitted to the CFO, Digital Farming and all the interview subjects.

1.3. Research Objectives

There are four objectives for this study:

- To understand how to digitally transform the business model of a traditional product-based company.
- To explore how the new business model can incorporate both digital elements and service orientation at the same time.
- To examine if the subscription business model proves to be a better business model in terms of revenue and customer relationship.
- To investigate the adoption of digital service in emerging markets, also referred to as developing economies.

1.4. Research Question

It seems there is a gap in the literature on the transformation of traditional business models into a digital business model. The situation is almost the same when it comes to the transformation towards a service-oriented business model. During this era of Industry 4.0, it appears to be highly relevant to come up with research that aggregates digital transformation of existing business models and how to be service oriented at the same time. Bundling of products-services also seems to be the demand of the hour. Hence, the following research question is formulated:

RQ: How to revamp the business model of a traditional product-based company to service orientated by embracing digital transformation?

1.5. Thesis Structure

This research paper begins with an introduction about the topic of my study and the background on the digital transformation in Yara. This chapter also provides insights into the research objectives and the research question.

Chapter 2 begins with the literature review explaining the approach and methodology for redesigning a business model. It further narrows down to elaborate on the service-oriented business model and a suitable example for the service-oriented business model. i.e. subscription business model. Chapter 3 focuses on the theoretical framework focusing on the resource-based view and VRIO framework. It was important to include the resource-based view for understanding the sustained competitive advantage of Yara. Chapter 4 describes the research approach and methodology used. Chapter 5 emphases on the analysis of the data collected in a narrative way using original quotes. Finally, Chapter 6 concludes the research paper with the limitations of the study and implications for future work.

2. LITERATURE REVIEW

Digital transformation is the adoption of disruptive technologies to create value propositions thereby increasing productivity and social welfare (Ebert & Duarte, 2018). The universal adoption of digital technologies has led to new business models in every industry by creating new value propositions (Remane, Hanelt, Nickerson, & Kolbe, 2017). It is also accentuated that the digital transformation varies with industries.

There are also three strategic ways to digital transformation: focus on value propositions, change the business model or a combination of both approaches. Companies that follow a combination approach will attain a better position in the industry afterward (Berman, 2012).

For successful digital transformation, companies have to redesign both business and technology (Riss & Cigaina, 2017). According to Chesbrough (2006), there are three ways of value creation with new technology. One way is to incorporate technology into the current business, another is to license the technology to other firms and the final one is to launch ventures that exploit technology in new business areas.

To be successful with digital transformation, it is necessary to rebuild the organization from the foundation, which is the most difficult factor. It is important for companies to be digital at the core, rather than to just run digital projects. This necessitates connecting people, process, and products digitally (Gale & Aarons, 2018). There are mainly two complementary activities for successful digital transformation: to promote customer engagement with digital technologies and to reshape the business value proposition (Berman, 2012).

Based on IT's role in the entire business, there are mainly two different types of digital business models: 'Digital Business Model' and 'Digitally Enabled Business Model'. If digital technology plays a major role in the value proposition and the entire business, it is digital business model, whereas if at least one of the business model component is based on digital technology, it is digitally enabled business model (Cigaina & Riss, 2016).

Companies focussing on reshaping the business model usually center their value chain around customer engagement (Berman, 2012). While redesigning, we need to keep in mind the economy shift from product centric to a more customer-centric one (Tzuo, 2018).

Traditionally, organizations followed the hierarchical design in which superiors' plan and assign the tasks of their subordinates. In today's environment, these structures are unstable with digital evolution. Digital tools help the organization to become smarter with agile ways of working. Digital transformation also calls for the need to change existing ways of organizing and adapting to collaboration and self-organization. These digital organizations are less hierarchical, agile and collaborative. The design of an organization must also support its value proposition (Fjeldstad & Haanæs, 2018).

2.1. Business Model Redesign

A business model can neither be right nor wrong, but it can be either appropriate or inappropriate based on the company specifics (Blaschke, Cigaina, Riss, & Shoshan, 2017). It is certainly difficult for business model innovation, but it is doable (Chesbrough & leadership, 2007).

2.1.1. Redesign Approach

A business model represents the core business logic of the enterprise. One of the widely used business model representations is Alexander Osterwalder's Business Model Canvas (Cigaina & Riss, 2016).

Insert Figure 1 about here

This model provides an enterprise view focussing on the value creation of a single company in the business network (Blaschke et al., 2017). The key component in this model is the company's 'value proposition', the value proposed by the organization to its customers (Cigaina & Riss, 2016). In addition, there exists the network view emphasizing on the whole business network consisting of the company, customers, partners and competitors (Blaschke et al., 2017).

Insert Figure 2 about here

Businesses often lack a common communication medium between IT and Business units that proves to be a hurdle for digital transformation. To overcome this, we start with the

canvas model on the business side and a similar IT design model with the digital key elements on the other side. The five digital key elements are People, Businesses, Things, Data and Cloud.

People are referred to us digitally connected individuals emphasizing on mobility. Businesses are considered as a single business or group of business when interacting together provides complete solutions. Things are digitally connected objects with sensors for collecting data. Data in a digital model stands for real-time, consistent and transparent data. Cloud is a value-creating service model as well as a shared environment to which people, businesses and things are connected (Blaschke et al., 2017). Value is created when different digital key elements interact with each other, often referred to as the digital value drivers (Amit & Zott, 2000).

A threefold approach is followed on the business model redesign process: strategic focus areas, business model patterns, and digital value drivers. The objective of strategic focus is to keep the emphasis on digital transformation. These digitally focussed business model patterns generate value through digital offerings. This threefold approach helps to keep the focus targeted on the digital transformation, throughout the redesign process (Blaschke et al., 2017).

2.1.2. Redesign Methodology

To redesign the existing business model, we use the Business Model Design and Innovation (BMDI) methodology. BMDI is used to develop and evaluate business models (Eisert & Doll, 2015). Companies are considered to be successful with business model innovation when they are able to first roll out ideas which were originated by others (Lindgardt, Reeves, Stalk, & Deimler, 2009). BMDI takes both an enterprise view and network view into account (Blaschke et al., 2017). This design is used to identify new opportunities and provide possible layouts for the new business model. BMDI starts with the analysis of the existing business model. There are mainly four phases in BMDI: Analyze and improve, Challenge and change, Test and verify, Evaluate and decide. This order can be changed or repeated as required (Cigaina & Riss, 2016).

During the *Analyze and improve stage*, the current company's position in terms of business and market trends are studied. This includes analyzing customer value proposition and ways to improve it. It also consists of examining the competitor's value proposition and how to incorporate it to improve our company's value offering. Another investigation done in this stage is to identify how the existing services can be provided digitally (Cigaina & Riss, 2016). In

addition, analysis is carried out to find if the traditional service offerings, when replaced digitally will add to the revenue streams of the company (Berman, 2012).

The *Challenge and change step* is to identify the threats of the existing business model. In this step, we fundamentally focus on digital challenges and opportunities. This involves exploring the competitors' digital initiatives as well as figuring out customer expectations in a digital economy. Based on the above results, business model designs are developed with digital value drivers to guarantee focus on digital business (Cigaina & Riss, 2016).

While developing a business model design, companies must explore ways to establish a better position in the industry (Berman, 2012). Digital business model patterns are used to generate feasible model designs. It is also necessary that every business model design should address four aspects of a business: value proposition, customer segment, business operations and financial gain of introducing the new model (Blaschke et al., 2017).

During *Test and verify step*, the designs are consolidated after validating using the 'build-measure-learn' cycle. It is also important to validate the design based on customer demands at this stage (Cigaina & Riss, 2016). 'Test and learn' is considered to be one of the key elements determining the success of digital transformation (Burkacky, Deichmann, Hepp, & Mühlreiter, 2018). Companies need to test different variants of the business model and widely deliver the one with more potential (Chesbrough & leadership, 2007).

In *Evaluate and decide stage*, the best promising business model design is chosen and is tested quantitatively and qualitatively against two dimensions - the impact and the ease of implementation. The impact is the effect of the business model execution, while ease of implementation refers to the possible barriers like potential costs involved and internal resistance. The major challenge in this process is to keep the design target focussed on digital business (Cigaina & Riss, 2016).

Over the past 9 years, there is a tendency to adapt to new business models to keep consistent customer engagement leading to long term relationships. Netflix, Amazon Prime, Uber, Spotify, Salesforce, Zendesk, Box are examples of companies that happened to pass through this shift (zuora, 2019d).

As organizations mature, their ability to adapt to change decreases. The average life expectancy of the firms in the S&P 500 reduced from 90 years in 1935 to 15 years in 2005

(O'Reilly III & Tushman, 2008). Considering the Fortune 500 list, we can find the companies that digitally transformed only persisted. A very good example of a company that stayed in the list is the industrial giant GE, now known to the world as 'the digital industrial company' (Tzuo, 2018).

2.2. Service Oriented Business Model

Competition and customer demands are driving traditional industries to transform their existing business models based on product-sales to be more service-oriented nowadays. The service-oriented business models help in maintaining the focus on digital services as well as in providing better solutions. Decreased sales due to commercialization along with low-cost players are forcing incumbent players to offer their products with high service content. This, in turn, helps the traditional companies in extending their market scope (Kindström, 2010).

When it comes to digital transformation, companies are trying different approaches to bring talents together (Nott, 2017). One great example is IBM that changed its business from selling products to product-services instead.

Firms must develop dynamic capabilities to kickstart service innovation to develop new services. Dynamic capabilities mainly consist of three activities: sensing and seizing opportunities as well as reconfiguring resources accordingly. Product-centric firms are moving towards a service delivery model. To implement these activities, an accommodating business model should also exist. It is better to make changes to the existing business model and focus on the exploitation of existing opportunities rather than chasing the exploration of new opportunities (Kindström, Kowalkowski, & Sandberg, 2013).

Firms redesign the business model after realizing the importance played by services in their business. The most important focal points for redesign are value creation and value capture. Service-oriented business models that address the explicit analysis of value creation and value capture are sustainable. The emergence of service-oriented business models is due to the fact that the concept of services proves to be valuable as compared to goods (Golnam, Ritala, Viswanathan, Hanser, & Wegmann, 2012).

One of the core objectives of value propositions is the creation of multi-service platforms to attract customers (Kotarba, 2018). Most of the traditional product-centric firms

previously provided services for free to improve their product sales, but recently they are converting from free services to fee-based as part of digital transformation.

These product-centric firms usually struggle with service innovation. Service innovation is the reorganization of resources in a value chain to create new opportunities for the actors involved in the business network. There are mainly two dimensions for this service innovation: service focus and revenue model. Services can either be product oriented like the one to improve sales or process-oriented, i.e. to improve the customer processes like quality control (Kindström, Kowalkowski, & Marketing, 2014). Another dimension is the revenue model, where customers are introduced to recurring revenue models like subscriptions. For example, GE Aircraft Engines successfully reinvented their business model to be more profitable with a pay-per-use value proposition (Lindgardt et al., 2009).

Nowadays, users are more convenient with fee-based subscriptions due to the ease of use. Prior studies also suggest that strong gender-based marketing strategies can acquire subscribers for the service providing platforms (Bhattacharjee, Gopal, & Sanders, 2003).

2.2.1. Subscription: A Service-Oriented Business Model

Accessibility is the future as opposed to ownership (Polanka, 2013). This attitude had given rise to a new service-oriented business model: *subscription business.* In a subscription business, customers pay a recurring fee in return to access a service or product. Most of the companies are shifting towards subscription business due to the rise in interest to predict the revenue streams (McCarthy, Fader, & Hardie, 2017). Another highlight of these subscription services is their reasonable cost. For example, the subscription services for printed books existed for a long time (Polanka, 2013). Of late, with digital transformation, these subscriptions are offered with e-books.

Every western country households are one way or the other involved in different subscription services. There are different charges for subscriptions mainly an activation fee which is a one-time installation fee; a subscription fee which is the recurring fee; a usage fee which is for additional usage and a cancellation fee for exiting the contract before the agreed period. One of the challenges for the service provider is to come up with an optimal pricing policy which is a combination of any of the three above said fees. This optimal pricing needs to be appealing for the customers and at the same time follow a penetration strategy. The cancellation fees are a source of revenue with which service provider can maximize profit if a

customer leaves during the regret period. The subscription model provides the service provider with a predictable revenue stream and a list of loyal customers (Fruchter, Sigué, & Control, 2013).

The latest SEI shows the growth metrics of hundreds of companies across Europe, North America and APAC which includes industries like SaaS, IoT, corporate services, media, and telecommunications. It is clearly indicated in Figure 4 that IoT is still the fastest growing sector (Zuora, 2019a).

Insert Figure 3 about here

Most of the companies are building customer-centric models and transforming towards subscription business. In a subscription business, customers will stay long term, which will ultimately increase the company's value (LI, 2019). An analysis of the last year's subscription data revealed the fact that revenue was driven by customer acquisitions rather than revenue per account. The B2C growth has outrun B2B and the B2C churn rate has also reduced (Zuora, 2019a).

Many of the early adopters of this model are experiencing growth and that is the reason why more businesses are turning towards this subscription model. There is also a slight rise in adapting to a subscription economy especially in Europe as compared to the US (LI, 2019).

3. THEORETICAL FRAMEWORK

We draw on two separate theoretical perspectives: the resource-based view of the firm incorporating the VRIO framework and knowledge-based view of the firm to emphasis on tacit knowledge gained over years of experience.

3.1. Resource Based View

Resource-based view indicates that differences in firms' performance are mainly determined by its resources and capabilities. Resources can be further classified as tangible and intangible resources. Tangible resources are those that can be easily observed and measured. It is further categorized into financial resources and capabilities, physical resources and capabilities, technological resources and capabilities, organizational resources and capabilities.

Intangible resources are those resources that are hardly observable and are very difficult or even impossible to quantify, but these intangible resources are widely accepted. It is difficult for a firm to have competitive advantage by relying entirely on tangible resources and capabilities. Examples of intangible resources include human resources and capabilities, innovation resources and capabilities, reputation resources and capabilities.

3.1.1. VRIO Framework

The resource-based view mainly focuses on value (V), rarity (R), imitability (I) and organizational (O) aspects of the resources and capabilities. According to the VRIO framework, it is difficult to evaluate resources and capabilities in isolation.

Insert Figure 4 about here

Hence, the VRIO framework presents four series of steps for any resources and capabilities to lead to sustained competitive advantage.

Value

The resources that add value can possibly lead to a competitive advantage for the firm. On the contrary, non-value adding resources may lead to competitive disadvantages. When changes occur in this firm's competitive space, the resources and capabilities that were earlier

considered as competitive can become obsolete. If a firm is unable to toss out non-value adding resources and capabilities, this will ultimately lead to below average performance.

Rarity

Even if resources are valuable, they might not be rare. Valuable resources and capabilities cannot lead to a competitive advantage but can rather lead to competitive parity. In order to provide some temporary competitive advantage for the firm, the resources and capabilities need to be both valuable and rare.

Imitability

If the firm possesses a valuable and rare resource, then it might be difficult for the competitors to imitate them. It is relatively easy to imitate a firm's tangible resource such as production plants, while it is challenging and difficult to imitate intangible capabilities such as tacit knowledge, motivation, and managerial talents. Imitation is difficult because of casual ambiguity: the difficulty in identifying the determinants of a firm's successful performance. In essence, valuable and rare but imitable resources and capabilities may provide the firm with a temporary competitive advantage over a short period of time with an above average performance.

Organization

To leverage the full potential of the value, rare and inimitable resources and capabilities, the firm needs to be properly organized. In order to enable a firm to gain a competitive advantage, there might be thousands of organizational components that are bundled together to generate such a sustained competitive advantage. In short, only the valuable, rare and hard-to-imitate resources and capabilities that are exploited at the organization level can lead to sustained competitive advantage and above average performance consistently (Peng, 2009).

3.1.2. Dynamic Capabilities

The resource-based view can be further strengthened with an emphasis on dynamic capabilities. Very recently, scholars started to stress on the prominence of the knowledge-based view of the firm. Tacit knowledge is a valuable, rare, inimitable and organizationally complex resource. It is the ultimate dynamic capability a firm can have in its pursuit for competitive advantage. These invisible assets include knowledge gained from customers interaction over the years as well as knowledge from product development and political connections (Peng, 2009).

4. RESEARCH METHODOLOGY

4.1. Research Design

4.1.1. Choice of research design

A research design is a framework or plan that guides you through the research process for achieving the research objectives. Typically a research design includes research question, propositions, unit of analysis, linking data to propositions and criteria for interpreting results (Wilson, 2014).

According to Yin (2018), there are three conditions used for determining the method of the research (1) form of the research question (2) the extent of control a researcher has over actual behavioral events, and (3) the degree of focus on contemporary as opposed to entirely historical events. Table 5 shows the relevant situations for different research methods.

Insert Table 5 about here

Based on the above table, a Case Study is the most compatible method for my research.

Case studies are widely used research method as they offer insights which cannot be achieved through other approaches. It uses a wide variety of evidences such as interviews, observation, and documents. In short, case studies are useful when a ‘how’ or ‘why’ question is asked focussing on contemporary events over which the researcher has no or little control (Rowley, 2002).

- My research question starts with ‘how’: The aim is to understand how to revamp the business model of a traditional product-based company and how to switch to a service-oriented business model by embracing digital transformation.
- The researcher has no or little control over the events: I do not have any control of the events happening in Yara on the focal subject of this research.
- Focus on contemporary events versus historical events: The research should focus on events happening at the present time. My study concentrates on events related to digital transformation and business model redesign. Most industries especially agriculture has very recently started to embrace this transformation.

Considering the above facts, I have designed a single case study. According to Yin (2018), one of the rationales for a single case study is a common case. This study about the change in business models as part of digital transformation during Industry 4.0 can be considered as a common case. It can also be viewed as a traditional product-based company entering into services as part of digital transformation. The results of this study can contribute to external validity and reliability.

4.1.2. Conceptual framework

The framework by Eisenhardt (1989) is applied in this research to develop theory from the case study. This framework is considered appropriate for new topic areas. Digital transformation and the consequent change in business models, are certainly research areas yet to be explored. This framework also connects design of case study research with grounded theory building. Theory generation from case study evidence is the main aim of this framework which exactly falls in place with the goal of my case study research.

Insert Figure 6 about here

This framework is considered highly iterative and tightly linked to data. The various steps in this framework are Formulating Research Question, Selecting Case, Case Study Protocol/Multiple Data Collection Methods, Entering the Field, Analysing Data, Shaping Hypotheses, Enfolding Literature and Reaching Closure. Only the steps from Formulating the Research Question to Shaping Propositions will be within the scope of this research. The rest of the steps Enfolding Literature and Reaching Closure are considered as implications for future work.

4.1.3. Unit of analysis

According to Yin (2018), this research is a Type 1 holistic case study considering a single unit of analysis. The holistic unit in this case study is the Digital BU of Yara, i.e. Digital Farming. It was important to analyze how the digital transformation of a big company started off with a very small cluster in an existing business unit. At the very early stages of the digital transformation in Yara, DF was embedded within an existing BU. Later, DF was separated as an individual BU.

4.1.4. Type of case study

According to Wilson (2014), there are two different research approaches: inductive and deductive. A deductive approach develops a hypothesis based on the existing theory and then design a research strategy to test the hypothesis. In contrast, the inductive approach would collect data and develop a theory as a result of data analysis. Usually, quantitative studies are deductive in nature and qualitative are inductive in nature.

Insert Table 7 about here

There are mainly two different types of research strategy: qualitative and quantitative. While quantitative research analyses numerical data, qualitative research examines narrative data. In a qualitative study, research question often starts with ‘how’ or ‘what’ whereas in quantitative it starts with ‘why’.

Case studies can be further classified into three: Exploratory, Descriptive and Casual research. Exploratory research follows an inductive approach and is largely qualitative. In this type of study, there exists very little or no prior work to refer to. Descriptive research is either qualitative or quantitative. It is carried out to describe existing or past phenomena. Casual research is solely concerned with learning ‘why’.

For this case study research, primary data mainly consists of narrative data obtained through interviews. The research question also starts with ‘How’. A bottom-up approach to develop propositions from the analyzed data is followed in this study. These imply the study is a qualitative, inductive case study.

While the approach is inductive in nature, this should not be seen as ignoring the existing literature. On the contrary, I followed an iterative process involving back and forth reference between data collected and existent literature. I would rather prefer to call the approach as pragmatic. Pragmatists place the research problem and research questions at the center of the research and employ methods they consider the most appropriate in answering the research question (Wilson, 2014).

This study is exploratory in nature. Indeed, it is carried out to explore how the transformation happens; how a different business model is implemented to incorporate digital in the organization. The research needs to explore in depths and analyze the various stages of

this transformation. In short, this is as an ***exploratory holistic qualitative inductive case study***. To begin with the research, a case study protocol (*Refer to* Appendix A) was designed.

4.2. Data Collection

4.2.1. Timelines

As part of my course subject: ENT4210, I received an opportunity to do an internship with Yara International ASA. During this time period (October 2018 to December 2018), I had discussions with my manager, CFO of Yara Digital Farming, to understand the various issues and hurdles faced during the digital transformation of Yara. Based on the thoughts, I formulated a research question. She helped me in getting in contact with the relevant interviewees inside Yara. All the interviewees were sent an introductory note about the thesis and request for a possible interview date. The literature review was done in January 2019 and February 2019. Interviews were done in March 2019 and early April 2019. The report was consolidated in the last weeks of April and early May 2019.

4.2.2. Data collection methods

Primary data collection includes a range of collection tools such as interviews, observation, and questionnaire. Interviews are usually associated with qualitative research. Secondary data include general reports, theses, newspapers, academic journals, textbooks, internet websites, abstracts, etc (Wilson, 2014). It is important to include secondary data in the research for the purpose of data triangulation.

Primary Data Collection

Interviews

Semi-structured interviews were the primary source of data collection for my research. Data was obtained through face-to-face and Skype interviews. The interviewees were from three different companies: Yara International ASA, SNC-Lavalin Atkins, and Zuora. The interviews were conducted for ten employees from Yara International ASA, one employee from SNC-Lavalin Atkins and three employees from Zuora. In general, interviews lasted for about 40 to 45 minutes. All the interviews were recorded. The recording time amounted to about 9 hours in total. The interviews were usually transcribed on the same day as it was conducted. Later, a table of interview insights (*Refer* Appendix C) was created from the transcriptions. On

an average, it took two hours for each transcription with a total of approximately 260 hours of transcription for 13 interviews.

Insert Table 8 about here

Table 8. shows the interviewees list with the company name, designation of the interviewee, date of interview and type of interview (face-to-face or skype). In one of the interviews, I had two interviewees making a total of 14 interviewees with 13 interviews. Two pilot interviews were also conducted as part of my course subject-ENT5100 regarding the same study subject. This helped me to tweak the interview guide a bit, to include more questions on the subscription economy and servitization.

Interview Guide

The interviews are a great source for gathering valuable data. A well-crafted interview guide was prepared to serve the purpose of aligning theory with practice (*Refer to* Appendix B 1.1). The interview guide was prepared with utmost care to cover the relevant theory stated in this report. All the interviews were conducted based on this interview guide. The themes of the interview guide were identified from the existing literature.

Before conducting the interviews, interview guide was reviewed by both my Supervisor at Oslo University and Manager in Yara. According to Wilson (2014), an interviewer should always focus on asking open questions to the respondent. It was also important to probe the interviewee by asking 'why' questions.

Initially, a generalized interview guide was prepared to incorporate the theoretical foundations. For better participation and open discussion during the interview, two different interview guides were developed from the general one. The internal interview guide (*Refer to* Appendix B 1.2) focussed more on DF and was used exclusively for interviews within Yara.

For interviewing participants outside of Yara, certain questions were adjusted to focus on agriculture rather than on digital farming (*Refer to* Appendix B 1.3). The intention was to keep the participants active in expressing their views with a simple word 'agriculture' as opposed to DF. This was done with extreme care, without skipping any of the relevant topics in the theoretical foundation, aiming for generalizable results.

Secondary Data Collection

Secondary data (*Refer to* Appendix D) was prepared by selecting the top ten companies in the list of 'Top successful companies on Fortune 500 List'. In addition, data was also collected from the corporate websites of companies owning digital solutions. The Zuora website helped me in collecting all relevant data related to subscription economy. With secondary data, 'data triangulation' is also done to ensure validity, credibility, and reliability in the research study. Data triangulation is vital for arriving at generalizable results. Also, triangulation made possible with multiple data collection methods provides stronger corroboration to hypotheses.

4.3. Entering the Field

According to Eisenhardt (1989), entering the field refers to flexible and opportunistic data collection methods. Also, referring to the overlap of data analysis with data collection.

During my internship at Yara International ASA, I build many contacts both within and outside Yara. This helped me in getting more interviews with Yara and Zuora. I would agree with the theory that I had a flexible and opportunistic data collection. All the interviewees suggested me to contact them again if in case any doubt arises while transcribing. As most of my interviewees were within Yara, it was easy for me to contact them again. Working in Yara also helped to observe the chain of events occurring as part of the digital transformation within the company. Team meetings were also an unavoidable part of my observation stage, helping to understand the upcoming focus for DF in Yara. I realized during data analysis that most of the data collected through interviews overlapped with interviewees.

4.4. Data Reliability

In order to improve data reliability, Yin (2018) suggested the following:

- *Use multiple sources of evidence:* Even though the case company is Yara International ASA, data was also collected from two other companies to receive an external perspective about the events happening around digital transformation in the agricultural field. In addition, secondary data was also collected for data triangulation.

- *Create a case study database:* All the interviews were transcribed and maintained for later referral and data analysis.
- *Maintain a chain of evidence:* This research follows a connected series of events from research question formulation to data findings. It starts with the digital transformation and then tries to identify the best suitable service-oriented business model.
- *Exercise case when using data from social media sources:* The usage of social media sites was limited in this research. In case a referral was made, different websites were cross-checked to see if the data was correct.

4.5. Shaping Hypotheses

After pouring through the data, common themes were identified in this research. Eisenhardt (1989) encourages to find the 'why' behind these relationships. Shaping hypotheses in theory building involves measuring constructs and verifying relationships. This, in turn, led to the formulation of three propositions highly relevant for this research. As mentioned earlier in this chapter, these formulated propositions can be tested at a later point of time with a different data set to prove external validity and reliability of the research design.

4.6. Ethics

As a first step, a brief outline of the thesis subject was given to the interviewees through email. Before starting the interview, permission was sought to record the interview. Also, it was mentioned, if the interviewee at any point of time doesn't feel comfortable recording the interview can ask to stop recording. They were also given full freedom to skip any of the questions if they dislike answering them. The interviewees were also informed that the interviews will be transcribed, analyzed and some of the conversations will be quoted in the thesis if needed. It was also said that the information shared as part of the interview will be shared with the University of Oslo and Yara International ASA.

5. DATA FINDINGS AND ANALYSIS

5.1. Data Analysis Strategy

According to Yin (2018), there are mainly four general strategies in analyzing case studies. They are relying on theoretical propositions, working your data from the ground up, developing a case description and examining plausible rival explanations.

This case study follows the inductive method without predefined theoretical propositions, hence relying on theoretical propositions is inappropriate. This research doesn't either consider plausible rival explanations.

The method followed for this inductive exploratory case study is: working your data from the ground up with a combination of developing case description. Data is analyzed to find useful concepts amalgamating with grounded theory. This matches the research with 'working your data from ground up'.

There are five analytic techniques for a case study: pattern matching, explanation building, time-series analysis, and logic models. Of these, pattern matching technique is used for this case study.

In this case study, data derived from these interviews will be analyzed thematically (*Refer to* Appendix C). The thematic analysis deals with searching patterns across the data set. A theme represents a pattern within the data set. The themes were primarily selected from prior literature. Coding of data starts with the analysts trying to identify patterns within the data (Braun & Clarke, 2006). This data set was then examined to find repeating themes to formulate the propositions.

5.2. Overview of Companies

Three companies were interviewed as part of this research. The companies are Yara International ASA, Zuora and SNC-Lavalin Atkins. This paper is a single case study focussing exclusively on the digital transformation of Yara International ASA. Two other companies were included to identify any bias in results and to get a better external perspective about digital transformation in agriculture.

5.2.1. SNC-Lavalin Atkins

SNC-Lavalin Atkins is one of the world's leading design, engineering and project management consultancies. Atkins delivers innovative digital solutions in the field of transport, industry, health, construction and public sector adding value to end customers. They mainly focus on consulting, project management, Cloud solutions, IoT, AI, and digital asset management. Digital solutions from Atkins helps customers in finding and adapting to new business models (Atkins, 2018).

5.2.2. Zuora

Zuora is a cloud-based software company that enables any company in any industry to successfully launch, manage, and transform into a subscription business. The company claims: '*the idea that customers are happier subscribing to the outcomes they want, when they want them, rather than purchasing a product with the burden of ownership*' is the heart of the subscription economy. The CEO of Zuora, Tien Tzuo coined, '*Subscription Economy is a phrase to describe this new era of companies and business models*.' For Zuora, success means engaging customers in long-term relationships (zuora, 2019d).

5.2.3. Yara International ASA

Yara International ASA is a Norwegian chemical company and its largest business area is the production of nitrogen fertilizers. The company was founded in 1905 as Norsk Hydro and later demerged as Yara International ASA on March 25th, 2004. Yara has its headquarters in Oslo and is also listed in the Oslo Stock Exchange. Yara has more than 16,000 employees worldwide (Wikipedia, 2016).

Yara International ASA had a revenue of 13.1 billion USD for 2018. Yara operates in more than 60 countries and sells fertilizers to more than 150 countries worldwide (Wikipedia, 2016).

Yara's vision is a collaborative society; a world without hunger; a planet respected. Yara's missi*on is 'Responsibly feed the world and protect the planet'*. By 2050, we need about fifty percent increase in food production to feed the world. In addition to this, around 3.7 million people died of ambient air pollution in 2012 which may possibly double by 2050. To counter these factors, Yara introduced crop nutrition solutions and precision farming allowing farmers

to increase yields and improve the product quality with minimal environmental impact. Yara's environmental and industrial solutions improve air quality and reduce emissions.

Yara introduced Digital Farming (DF) Business Unit (BU) in 2017. Yara believes DF can be a solution to many of the problems faced by farmers. Digital transformation is the key to provide the full potential to the farmers by increasing the yield per hectare thereby increasing their profitability. It will also help farmers with high-quality food production, less wastage of fertilizers and better value with optimized operations. Yara wants to be at the forefront of the agricultural industry with digital transformation (YaraInternational, 2018) and emerge as the leader in Digital Farming.

5.3. VRIO Resource for Yara

Literature also points to the fact that tacit knowledge gained over the years is a source of valuable, rare, inimitable and organizationally complex resource that possess dynamic capabilities to provide a competitive advantage. The Director of Commercialisation in Yara emphasized on the scalability of this knowledge, "*We made a strategic decision in Yara to scale our knowledge...it is then clear that we need to be digital, that is the medium, that is how we can scale knowledge across the globe."*

It was important to identify what kind of communication is provided to the farmers as digital services and whether this information can be provided by Yara's competitors at the same time. Hence, the VRIO framework is brought into the picture to identify the sustained competitive resource of Yara.

The information provided to the farmers is recommendations or agronomy advice. This agronomy advice is considered valuable. These recommendations are based on a hundred plus years of agronomy knowledge of Yara which marks its position as a rare and inimitable resource. In addition, Yara has prepared itself organizationally to exploit this knowledge by being digital. This makes the hundred plus years of agronomy knowledge of Yara as the outcome of the VRIO framework to be utilized as a sustained competitive advantage. All the interviewees from Yara unanimously complemented their view with this finding.

5.4. Yara's Digital Journey Thus Far

As part of the digital revolution, Yara has introduced many digital solutions or digital tools that can lead to an increase in yield and profitability for farmers. Some of these digital

solutions became part of Yara by start-up acquisitions. ‘Atfarm’, a digital tool was launched in March 2018 which optimizes the application of nitrogen fertilizers for the farms based on satellite data. Yara acquired trecker.com, a European farm management solution effective July 2nd, 2018. Yara also acquired the leading crop nutrition recommendation platform, Agronomic Technology Corp (ATC) on November 6th, 2017 to strengthen the DF offering. With these continuous innovations of new digital technologies, Yara focusses on digitalization of professional farmers as well as smallholder farmers (YaraInternational, 2018).

Yara’s DF is fully capable of scaling the existing digital tools available in the market for farmers and commercializing and exploiting the forthcoming opportunities. This BU also segments the market into smallholders and professionals for uniquely applying different penetration strategies.

Yara is one of the leading producers of nitrogen fertilizers in the world. They have also started to focus on digital solutions that need to be provided to their customers to optimize the usage of fertilizers and maximize production. One of the challenges for Yara is to provide fertilizers and digital services to farmers through a common platform.

In addition, Yara plans to have a central platform that will integrate all the Yara owned digital tools. In the near future, this might serve as a One Stop Shop for the farmers. This platform will certainly provide an enhanced customer experience by providing all necessary solutions sought by the farmer at any point in time.

In April 2019, Yara and IBM joined hands to scale up the possibilities of digital farming. "*Our collaboration centers around a common goal to make a real difference in agriculture. To be able to responsibly feed a growing population, it is critical that farmers increase food production on existing farmland to avoid deforestation. Yara and IBM will develop digital solutions that empower professional and smallholder farmers to optimize farming practices to increase yields, crop quality and incomes in a sustainable way*," says EVP Sales and Marketing in Yara.

IBM Global Managing Director Consumer Industries commented, "*As demand for food rises along with the world's population, the digital farming platform will play a key role in increasing global farming yields in a sustainable way. The collaboration is a perfect symbiosis of IBM's capabilities in AI, big data management and blockchain technology and Yara's*

agronomic knowledge, farmer-centric digital innovation, and proven track record in improving farming across the globe."

Yara's inimitable agronomic knowledge and IBM's prowess in technologies like AI, blockchain and data analytics will play a key role in commercializing the digital solutions innovated as a result of the collaboration. The initial target will be 100 million hectares of farmlands or approximately equal to 7 percent of suitable land available worldwide for cultivating crops. Weather data is one of the key focus areas of this cooperation. The ability to respond to the changing weather conditions is critical in the case of farming. In future, this collaboration might be able to provide greater traceability and supply chain efficiency as well as ways to tackle food fraud, food waste and sustainability by linking the farms into the full food chain (Yara, April 2019). The news of this collaboration has gained much traction in many of the social media sites and online information sharing sites.

With the data collected from the farms, Yara's DF tools can provide proper recommendations to farmers. "*There is a window of opportunity that Yara has now to emerge as the leader in Digital Farming by being customer focussed or result-oriented",* claimed the HR Manager.

One of the challenges with digital transformation as pointed out by Business Relationship Manager in Yara, "*It is impossible to compare most digital businesses with Uber or Airbnb. This is due to the underlying fact that most people do have a traditional business to start from as opposed to the born-digital start-ups."*

5.5. Digital Transformation and Service Orientation

The below sub-sections provide insights into the various stages of the digital transformation in Yara. *Section 5.5.1* delivers an understanding of the relevance of digital transformation in Yara from the viewpoint of the interviewees. With digital transformation, Yara is stepping into the sales of digital services to farmers. This, in turn, calls for the need to have a business model that accommodates both digital components and be service oriented at the same time. *Section 5.5.2* explores the opportunities of being service oriented.

Yara's core business is fertilizers. Nowadays, it is a trend for companies to add incremental services to their existing products. Hence, Yara too can advance forward by the sales of fertilizers-digital services package. *Section 5.5.3* helps us to understand more facts

about servitization, the product-services packaging. This research study addresses the shift of Yara from a product-sales model. In addition, the new digital service-oriented business model for Yara should be opportunistic enough to provide sales of both fertilizers and digital services as a package. *Section 5.5.4* sheds light on one such trendy business model which is followed by both born-digital start-ups and industry giants.

Lastly, *Section 5.5.5* shares one of the challenges for the sales of digital services and the possibilities of overcoming it.

5.5.1. An Omniscient view of Digital Transformation

It was important to understand what digital transformation exactly meant for the interviewees. Analyzing the data shows that, most of the interviewees had a common ground with few exceptions.

According to the CFO of Yara Digital Farming, "*Digital has the potential to convey high-quality communication to the farmers.*" She added, "*… digital, as I see is the solution to scalability. Digital will make it possible to communicate with millions of farmers across the world, which is not possible as of now. This ties into Yara's mission of responsibly feed the world."* The communication provided to these farmers is high-quality agronomic recommendations to increase yield and quality.

For the VP of Yara Digital Labs, "*Digital Transformation is mainly about digitally transforming the interaction with the customer. Digital Transformation is not just about technology and interacting in social media. It is a totally different way about how you interact with your customers. It touches processes, culture, and behavior. Yara is transforming which is very challenging and competitive. Yara is not only transforming the way it is interacting with the customers but also transforming the whole customer base. That is the whole notion or strategy of being farmer-centric. Typically, the farmer was not Yara's customer. The sales go through an importer, a distributor, a dealer, and a sub-dealer. Traditional Yara doesn't know the farmer. It doesn't transact with the farmer directly. With Digital Farming, Yara is trying to be farmer-centric. By being able to directly interact with the farmer and transact with the farmer is a double transformation. It is not just about digital channel interaction with customers but changing who the customer is for Yara."* This embarks the starting of a new journey for Yara, driving towards a farmer-centric company. Most of the companies are in this shift from product centric to be more customer-centric.

The Project Manager at Yara Digital Farming added,*" If we don't know our customers, then the digital transformation is impossible."* Only if we know our customers we will be able to understand their pain points. The Solution Manager for Smallholder farmers in Yara suggested, *"...you shouldn't do a single thing without considering the user. Digitalizing the whole ecosystem might benefit the farmers. If the farmer gets information about the market price of the crop, then he/she can negotiate with the middlemen."*

Consumers prefer on-demand access to services for meeting their needs (Polanka, 2013). They want their needs to be fulfilled by these services available at their fingertip enabled through smart devices. Nowadays, customers have the freedom to choose the place and time of service delivery. Digital technologies enabled providers to deliver better experiences to customers in terms of time and space (Saunila, Rantala, & Ukko, 2017). For example, USAA a financial services company in Texas claims the company's competitive advantage is in providing the best customer experience (Amit & Zott, 2012).

Traditionally, Yara is all about selling fertilizers to improve crop yield. Here the risk pertains as farmer is ignorant about the actual amount of fertilizer to be applied in the fields. It is based on manual calculations they arrive at the amount of the fertilizer to be applied in the next year. The Senior Manager- Digital Portfolio Management added," … *farmers need help with how much to apply and also when they need to apply".* Each of these opinions one way or the other contribute to the fact that digital farming tools can solve the problems faced by the farmer to a large extent.

The Digital Product Manager in Yara pointed out, "…*farmers still use paper or excel or even try to remember in their head about how much fertilizers they used in the previous year*". With digital tools, farmers can analyze the soil sample and apply the required amount of fertilizer. This helps in optimal usage of fertilizers leading to greater profitability and yield with less expense.

The Senior Manager- Digital Portfolio Management in Yara commented, *"One exciting thing to talk about the impact we make to people's lives. We can actually bring some of these smallholders out of poverty and really make a difference."*

From the above discussions, it is clear that each interviewee had a different perspective of how digital transformation can be an opportunity to Yara, but there is a clear alignment which shows digital transformation can generate new values for the farmers. In theory, value

propositions focus on the relevant opportunities offered by the firms to their customers (Saarijärvi et al., 2014).

It is a win-win situation both for Yara and the farmers. Yara's digital solutions directly or indirectly focus on the value proposition of higher yield and profitability to the farmers. For example, one of Yara's digital solution, 'YaraIrix' focusses on 'Optimise fertilization and Increase your yield'. YaraIrix app analyses the nitrogen needs of the crop. It gives nitrogen recommendations for different crops and for different growth stages (Yara, 2019).

In addition, half of the companies analyzed in the secondary data which had digital business elements also showed special emphasis to customers in their value propositions. For instance, the value propositions included: Customer Satisfaction, Customers are the focus, Customer First, Customer enthusiasm and Customer Obsession.

The above discussion leads to the following,

Statement 1a*: Digital transformation paves way to better value propositions to customers.*

An argument raised during the interview is, "*Digital transformation will provide better value propositions to farmers in the long term, but not sure about the short term. A lot of change management needs to happen on all levels to reap the fuller benefits of digital transformation*."

Value propositions are tools that enable customers to create value by incorporating the available resources of the firms. It must be based on the firm's unique resources and competencies that result in competitive advantage (Saarijärvi et al., 2014).

According to the VRIO framework, Yara's substantial competitive advantage is the hundred plus years of agronomy knowledge. This knowledge serves as the foundation for all the digital solutions built by Yara. It helps in providing valuable recommendations to farmers based on the analysis conducted by the digital tool. The CFO of Digital Farming said," *There is a solution called Yield Gap for the Smallholder markets which is in the very early days. It recommends your yield for today is 'this' but your potential is 'this'. We can help you close the gap. This is one collaboration that is going to happen together with IBM."*

Analyzing the data reveals strong opposition to the above-concluded *Statement 1a*. The Client Partner at Zuora said, "… *I wouldn't say it is important to transform into digital but to transform towards more service oriented. If service oriented is digital or not, depends on the*

business you are in. Often digitalizing services are considered equivalent to being service oriented.".

5.5.2. Focussing Towards Service-Oriented Business Models

Service-oriented business models began to emerge when the focus of the firms changed from the sale of goods to value creation for their customers (Saarijärvi et al., 2014).

The CFO of Yara Digital Farming commented," *Service oriented… It is in very early days. There is a lot more to go for Yara. It is the beginning of the journey, but it is starting to happen… If we can help the farmer with insurance to reduce the impact of severe weather, it will be a game changer. The weather and insurance are the pain points of farmers."*

Service innovation paves way to better customer interactions (Kindström et al., 2013). It is important to have access to customer data to identify their buying behavior (Saarijärvi et al., 2014). Enterprise Resource Planning (ERP) software such as CRM (Customer Relationship Management) can help in this aspect of gathering and analyzing customer data.

One great example of CRM is Salesforce. With the help of available data, this platform will identify the target market for the 'products-services' package. DF in Yara is also planning to have Salesforce, which will unify its access to customer database across solutions. This helps in maintaining one master data for every customer. The potential of the customer data can offer mutual benefits both for the firms and the customers (Saarijärvi et al., 2014).

Customer interactions provide opportunities for innovation and value creation (Kindström et al., 2013). When it comes to customer interactions, all-digital solutions developed in Yara are through the participatory design of the farmers. All these digital products go through a phase of continuous innovation by collecting the feedback from the reference farmers. This was unanimously agreed by all the interviewees inside Yara. On the whole, Yara is transforming towards a farmer-centric company.

The VP of Yara Digital Labs agreed that better value propositions are provided to customers by being service oriented. *"If you define a service with a predefined outcome for a predefined price, then for the farmer it is a better value proposition. So, we compare the product-based scenario where the farmer has to go to the biller, take two bags of Yara fertilizer, take it back to his farm and then has to figure out where to apply it, when to apply, not sure if he has used the right product, etc. In our service-based scenario, we actually provide the digital*

tools to the farmers. We can collect data from the farm and then analyze the best solution for that farmer. And also help him to determine what is the right product, what to apply, when to apply and where to apply it."

Customer data can be converted into information which can be used for customer value creation. This will accelerate service innovation (Saarijärvi et al., 2014). In terms of Yara, the data collected from the farm helps in providing the best recommendations to the farmers.

Firms with proficient service-oriented models can successfully convert opportunities into customer value propositions (Kindström et al., 2013). The Director of Commercialisation in Yara said," …*I think most of the digital tools offer a type of service. It is a model shift that is taking place due to the desire and need of the customers."* Most of the companies irrespective of industries are embracing this shift from product oriented to service oriented.

Nearly half of the companies in the secondary data list which were service oriented also had their value propositions focussed around customer centricity. At the same time, these companies were also digitally enabled. In addition, all the interviewees agreed to the focal shift from product centric to more customer-centric nature in business.

The above discussion leads to the following,

Statement 1b*: Value propositions are better comprehended today with service-oriented business models.*

The Client Director Digital Solutions of SNC Lavalin Atkins even highlighted during the interview, *"Service-oriented business model is better than the product-sales model. This can be applied in agriculture as well."*

If the focus of the digital transformation is aimed at better customer value propositions, then it is possible to expand the business from products to product-services (Blaschke et al., 2017). Digital being a key enabler for service-oriented, we combine **Statement 1a** and **Statement 1b** to arrive at the following proposition:

Proposition 1*: Digital transformation paves way to improved customer value propositions, better comprehended today with service-oriented business models.*

5.5.3. Servitization

The trend in providing services to go along with their existing products is referred to as 'servitization' (Kastalli & Van Looy, 2013). It is the combination of products and services into a single package.

The Director of Commercialisation in Yara shared, *"In most business environments, you sell it together. Exactly for the reason that the farmer doesn't buy a product as it is and in three years, it is outdated but rather wants to have something that continuously provides value to him or her."*

The Senior Manager- Digital Portfolio Management in Yara agreed on this," *The future is not definitely selling one bag of fertilizer, but it is setting the whole service. If we sell only fertilizers, we might be outcompeted by some other company which produces cheaper fertilizers".* Yara is in this path of service innovation for combining its core business of selling fertilizers along with digital services. The strategy chosen should be a win-win for both fertilizer business and digital solutions.

"Yara is sitting on more 100 years deep knowledge on agriculture. We have the ambition and passion to make sure the knowledge reaches all the farmers in the world so that they become more sustainable and produce more food. It is very difficult to do that if we sell only fertilizers. It is not possible to embed 100 years of agricultural knowledge into a bag of fertilizer. If we develop a digital platform and digital solutions which we deliver as a subscription service, then we have an opportunity to digitize the 100 years of knowledge and distribute that knowledge in the form of agricultural insights and recommendations to all the farmers", commented the VP of Yara Digital Labs. The Communications Manager in Yara shared the same view, "*To share the 100 plus years of agronomy knowledge, we have started using the collective knowledge base and share it with digital tools."*

The farmers have multiple pain points like unpredictable weather, lack of funds, etc. It is important that the service provided will solve their problems. One digital solution alone cannot eradicate all the pain points of the farmers across the globe. Yara plans to have a central digital platform with all integrated solutions with the opportunity to digitize the knowledge and distribute it in the form of agricultural insights and recommendations to the farmers.

The Client Partner at Zuora said, "*Future for all industrial companies like Yara, the real differentiator will come when they are packaged together and not sold separately. Then you can really leverage both, but still, in the ultimate solution, the products will just be the bearer of services. It will be the services you sell but the compelling factor for the customer is the service they are buying."*

Majority of interviewees both within Yara and external partners agreed that products and services as a package will provide better value to the customers than discretely.

Zuora CEO Tien Tzuo told CNBC, "*More and more companies are turning to the emerging subscription economy, and it could be time for the manufacturing industry to tune in…every single physical product is now coming off the assembly line connected to the internet. And what's happening is these products are becoming essentially edge devices in a network. What companies are seeing is now that my products are smart, when my engineers know how my customers are using my product – which is exactly like SaaS companies. They know how you use your product and they provide a service to you. What you're going to see is every physical product from appliances from Whirlpool, cars from Ford, tractors from Caterpillar – they're all going to go through a transformation and become services"* (Zuora, 2019a).

The above discussion leads to the following:

Statement 2a*: The product-services package provides better value to customers rather than as standalone.*

Both product sales and service sales should complement each other. It is important to have an integrated product-service business model to maintain the spillovers of products and services (Kastalli & Van Looy, 2013).

The demand is changing from products to integrated solutions which provides value to the end customers. The five major challenges of servitization are organizational structure, development process, business model, customer and risk management (Zhang & Banerji, 2017).

Organizations experience challenges when they try to incorporate services into their existing business. Here, the shift is from products to product-services as a package. The corporates are trying different packages of products, services, support, knowledge, etc (Vandermerwe & Rada, 1988) to identify which package has the best reach among their

customers. Only if firms believe in 'Know Your Customer', they will be in the position to provide the best value to them.

There arises a challenge for Yara when combining the fertilizers business into the digital. For the traditional fertilizer business, the farmer is not the direct customer of Yara. When combining fertilizer business with digital, the existing value chain of fertilizer business will be disrupted. This is supported by the VP of Yara Digital Labs," *If we bundle physical product into services, we need to figure out how to get that physical product to the farmer. So, we enter into the whole supply chain complexity which is difficult, plus Yara has got long-standing relationships with importers, suppliers, dealers, and sub-dealers. If all of a sudden, Yara is going to deliver the product directly to the farmer through a service model it is going to upset all the existing stakeholders."*

Another challenge is to present this bundle of fertilizers and digital services to the farmer in the most appealing way. Most of the Yara fertilizers are at the high end, both in terms of quality and cost, which makes it practically difficult for smallholder farmers to buy the product. Still, these smallholder farmers are in a position to pay for the Yara digital services. Another lens to look at this challenge is the hurdles faced in combining a traditional physical product with a new set of services.

One efficient way of tackling this challenge as recommended by the General Manager-EMEA of Zuora is," *start from the outcome and work backward. What we sell is the outcome, not fertilizer. It could include a number of services*." We need to think about exactly what is the outcome expected by the farmers. The Regional VP Nordics of Zuora explained*," What outcome does farmer need… if the fertilizers and services can provide better yield and you can measure it…Teach them to buy something that they never used to. You need to take a journey with the farmer and one step forward with servitization."*

We need to come up with a different combination of fertilizers and services that will provide value to the farmers. The Director of Commercialisation in Yara supported this," … *if in some way we provide clear evidence to the farmer that the combination of fertilizers and services will provide a better outcome."* The Client Partner at Zuora said that Yara can even sell the service of fertilizing fields instead of selling fertilizers.

As common with most corporates, Yara too needs to set clear boundaries for their traditional fertilizer business and the newly incorporated digital business. One can certainly

complement another in sales but there needs to be a clear strategy for digital business. The General Manager- EMEA of Zuora said," *Product differentiation becomes difficult for big companies. You need to diversify into service offerings. The general trend across all industries is to add incremental services".*

5.5.4. Subscription Business Model and Revenue Generation

Revenue offerings generate firms' value from value propositions. It is important to focus on value proposition and revenue mechanisms. Focussing only on value proposition can lead to a downfall in service revenue. It is recommended for firms to join forces with other service providers to offer better value propositions to their customers (Saarijärvi et al., 2014). On May 7th, 2019 Yara has started charging the farmers for the digital services through a third-party subscription platform, Zuora.

The Client Partner at Zuora said, "*Being service oriented, is to actually deliver continuous value and more value by using rather than buying. You are paying for the value you get. That is more business to me and one of the best models for this is the subscription business model".*

To seize market opportunities, it is recommended to introduce new revenue mechanisms. One such recurring revenue model is the subscription business model. These revenue models can be fixed price or usage-based or even based on productivity (Kindström et al., 2013).

The Director of Commercialisation in Yara said," *The beauty of subscription business is that we have recurring revenue as compared to the one-time sales. One-time revenue limits you to having to resell every year, over and over again and basically from scratch. Ongoing improvements will be the compelling factors for farmers to enroll for subscriptions. For example, you always buy the best version of the service and not something that just in three years will be outdated."*

The traditional product economy was all about acquiring new customers, shipping commodities and billing for one-time transactions. In the modern era, the focus has shifted to relationships. It is about finding new ways to deliver ongoing value to customers, leading to long-term relationships (zuora, 2019d).

The Senior Manager- Digital Portfolio Management in Yara commented," *Subscription business is really important. Digital tools improve year after year.… it is not possible to value if you would pay one-time fee today for having a digital tool that will continuously improve forever. So, it is not possible to think of any other revenue model for digital tools. I definitely think that the digital tools in a subscription-based model will improve Yara's revenue."*

The theory states that predictive revenue and reasonable cost are the main reasons why business and customers are attracted to subscriptions. This is agreed upon by the VP of Digital Labs, "*It is not necessarily possible to generate more revenue, but the revenue you will have is of higher quality. You don't have a lumpy revenue. If you look at Yara Europe, they have got a peak of the revenue and cash flow during the start of the season (February, March, April). It is very lumpy demands and very lumpy cash flow. You only interact with the farmer, once or twice a year. If we go to the service model, we engage with the farmer throughout the year because of the subscription-based service. There is always a good reason to interact with the farmer and, if we bundle the fertilizer into the subscription service, then we don't have the lumpy demand during the beginning of the season but a constant cash flow over the year. Even if the lumpy cash flow is higher, they would rather have a bit less cash flow, but every month a little bit but steady and predictive."*

Yara has also started to charge the farmers through subscriptions for the usage of digital services. The piloting is for the German farmers and only one digital solution, YaraIrix is available in the initial release. During this phase, farmers can avail subscriptions by paying with credit cards. Farmers are also given a regret period of 14 days with a full refund. The renewal will happen annually, and an invoice will be sent to the farmer every year. This will help in building a long-term relationship with the farmer.

The CFO of Yara Digital Farming said," *We are heading in the right direction with the subscription management, but … we are just beginning... The Zuora and the subscription, that is only the tools but, the quality of the digital solution and the value we bring to the farmers need to be seen and felt in their pockets immediately."*

In the last ten years, there is an increase in subscriptions which is referred to as Subscription Economy Index (SEI). According to SEI, the subscription business has grown five times faster than the S&P 500 which equates to 300 percent growth in the past seven years (LI, 2019). The Subscription Economy Index versus S&P 500 is indicated in Figure 9.

Insert Figure 9 about here

The above discussion leads to the following,

Statement 2b*: Subscription business model offers stable revenue and a better relationship with the end customer.*

The General Manager- EMEA of Zuora said," *Subscription is important because of the relationship with the end customer… deliver strong customer experience to avoid churn. You must have the ability to upgrade or downgrade a service… customers should have the freedom to leave. This should not be easy but not difficult. It is better to combine simple flat recurring fee with usage; total usage and total flat fee always suffer."*

One of the major challenges of the subscription model is to come up with optimal pricing which includes one-time installation, subscription fee, usage fee and cancellation fees that works for our customer.

The Client Partner at Zuora*,"The magic triangle optimizing the acquisition, retention and pricing model to obtain the most revenue. As you mature, you need to focus on either acquiring or retaining the customers. The pricing model is the proper packaging of how to charge. It is recurring daily, monthly or annually and also consider if it is usage-based, set up fee and recurring fee. It is the proper packaging based on how the customer wants to buy it… In the case of digital products where the cost of delivery is zero, binding customers to longer terms might not be a good idea. It has shown in industries with such services that giving customers full flexibility of when they sign up and when they cancel or pause it, actually generates more value than binding them. If you have services that have a cost to deliver when especially you have an upfront cost, then those businesses should lock in customers for a certain time period, but I do believe that should be fairly flexible and lock in the customers as short as possible".*

It is found that companies that take advantage of usage-based pricing show faster growth but too much of this pricing stalls (Zuora, 2019b). The ability of a company to handle subscription changes like upgrades, downgrades, add-ons and other changes throughout the subscription cycle will drive year to year growth (Zuora, 2019c).

The Client Director Digital Solutions of SNC Lavalin Atkins said," *We try to sell everything we develop as a subscription. It is either Cloud as a service or AI as a service."*

Nowadays, it is trending to sell the product services package through subscriptions. Hence, we combine **Statement 2a** and **Statement 2b** to arrive at the following proposition:

Proposition 2*: The product-services package sold as subscriptions results in stable revenue as well as better value and relationship with the end customer.*

5.5.5. Service Reception: Acceptance of Digital Services in Emerging Economies

From the above discussions, it is clear that Yara is selling services to farmers through subscriptions, but for the farmers to receive these services they need smart devices at their end. In aligning with the trend, smartphone is the usual means of service reception for customers.

The CFO of Yara Digital Farming said," *Farmers in US are very skeptical in trusting advice that comes from the mobile phone. If you can prove your algorithm can say the same thing about what my mind tells about my field, then I might trust. In countries like India, the acceptance of technology might be less of a barrier. The issue will be how to reach these farmers. If the farmer doesn't have smartphones, the only way to communicate will be through SMS."*

The literature points to the fact that we need to have a smartphone or any other smart devices and at the same time internet access to be a receiver of digital services. The digital solutions provided by Yara are a combination of software, hardware, and agronomic knowledge. With the help of these tools, data is collected and interpreted, and best recommendations are provided to the farmers for water, soil and nutrient supervision (Yara, 2018).

The Solution Manager for Smallholder farmers in Yara said," *In rural areas of Tamil Nadu in India, farmers may own a basic phone and not a smartphone*. *Most of the farmers don't know how to use smartphones*". The Digital Product Manager in Yara also supported this view," *European markets are generally better than Asian ones. In countries we have been, farmers had smartphones. Some might know how to use it. Some are not flexible, they don't believe in technology."*

The VP of Yara Digital Labs commented," *The technology learning is quite good, and they are not necessarily technologically backward. That doesn't mean all the farmers are around with iPhones, but the situation is not that bad. If we focus on developing countries like India, Africa, and Thailand, we see there is no technology legacy. The only thing there is mobile and mobile devices. If we develop a solution for US, we have to build a web-based solution and a mobile solution because some farmers use only PCs in their office, other farmers are more advanced and use an iPad, somebody else only uses mobile. So, we need to develop the same thing three times. When we build something for India or Africa, they only have mobiles. Farmers don't have PCs or offices, all they have is their mobile phones. So, we have to build only once. So, the underdeveloped technology is more of an opportunity than a constraint."*

The interviewees were more confident about the possibility to reach farmers, especially in the emerging economies. Even if smartphones were not an option, there were many alternative ways of communicating the agronomic advice or recommendations to the farmers.

The Director of Commercialisation in Yara said," *We see that ... in research, smartphone is the medium of choice. Especially in regions that are economically challenged, they have switched from no telephone, no computer to directly having a telephone in their hands… especially in the underserved regions, the smartphone becomes more predominant than the industrially developed world. In India or Africa, farmers will have access to phones, not necessarily need to be smartphones but 2G phones and in the very near future also to smartphones at a level, they can actually conduct a lot of their business activities for sure…. Text as a medium of exchange for farmers using base model phones."*

Technology acceptance is one of the factors that determine human progress. The number of people owning a smartphone and using the internet in developing nations has increased over the past years. Smartphones are more common in the U.S and Europe as compared to emerging economies. On the contrary, the usage of social networks is more frequent in emerging economies as opposed to U.S and Europe. Millennials, higher income, and highly educated people access the web more frequently and they usually own a smartphone. (Poushter, 2016).

The Business Relationship Manager in Yara argued,*" I would not be surprised if the people mentioned have WhatsApp, Facebook, do cashless payments with mobile phones and therefore I would be reluctant to call them technologically backward… it would be wrong for us to assume they don't have access to technology. They have phones which means we can*

reach them. A smartphone is not needed to reach them. Mobile payments are a super standard in Africa. Technology is not a barrier to reach those people."

The Communications Manager in Yara added,*" Smartphones are also used by farmers. So, start with the innovative farmers. How can a farmer with a cell phone provide help to other farmers?... Sub-dealers can be agronomists on behalf of Yara and help those farmers who don't own a phone."*

Analyzing the primary data shows interviewees were a bit skeptical about the usage of smartphones by farmers. Many of them even highlighted alternative solutions to smartphones like a base model phone and information exchange in the form of SMS.

For example, as a substitute for smartphone, the Senior Manager- Digital Portfolio Management in Yara suggested," *Services where farmers could call and listen to recommendations… Chatbots which can listen and answer back."* The farmers can also call into a toll-free number to listen to information.

Recently, Bajaj in India introduced chatbots to reach millions of their first-time appliance buyers. "*We're trying to grow our consumer side, so we need more user-friendly ways to engage consumers,"* says Bajaj. Due to the high volume of customers, reaching the one who needs help via SMS chatbot is a critical need. Customers can text the chatbot channel to report a problem or even schedule a demo for an appliance. Localization is also an opportunity with chatbots. The ambitious vision of Bajaj is, "*We'd like to teach the chatbot all the languages of India. That's 18 languages plus 3,000 dialects, using Sanskrit Unicode*" (Morales, 2017).

Another alternative solution proposed by interviewees is to establish a relationship with local Telco to provide recommendations to farmers. The Regional VP Nordics of Zuora advised," *The receiver at the other end for the digital services might need a smartphone. Provide a smartphone in a package in cooperation with Telco providers. Provide the phone for free and lock in the customers with a 6-month subscription."*

It is estimated that around five billion people in the world have mobile phones, of which half are smartphones. About 76 percent of developed economies possess a smartphone as opposed to 45 percent in emerging economies. In every country, highly educated and better income group are most likely to have internet access and social media usage. Studies show that most of the adults of the age group 50 and higher owned a smartphone in advanced economies,

while it is less than 35 percent in emerging economies. For example, according to Figure 10 in India, about 24 percent uses a smartphone and 40 percent uses a base model phone and 36 percent doesn't even have a phone (Taylor & Silver, 2019).

Insert Figure 10 about here

Though the technologies in developing economies are fast progressing, farmers are one of the low-income groups which are left behind. However, the smartphones among farmers are increasing but still, the gap is high compared to other professionals (Razaque & Sallah, 2013).

Interviewees disagreed that farmers are technology backward, rather referred to them as Emerging Markets. The above discussion leads to the following proposition,

Proposition 3*: The acceptance of technology is less of a barrier in emerging economies, with the possibility of alternative sources of service reception for digital services.*

For farmers without smartphones, Yara sub-dealers can also be a point of contact. Reference farmers and demo days in R&D centers can also be utilized to invite farmers and explain on the digital services available for Yara. These strategies can at least serve as a sort of market penetration, making farmers aware of the latest digital solutions available in the market.

Capsuling the data findings reveal subscription business model provides meaningful insights about company growth, stable revenue, and end customer relationship. It is possible for Yara to transform towards subscription business model and achieve the aim of being digital, service-oriented and farmer-centric all at the same time.

6. CONCLUSION

This exploratory case study follows the Eisenhardt (1989) approach of building theory iteratively, back and forth through the predefined steps. The study addresses the relevance of being both digitally enabled and service-oriented in a traditional product-based company. It also explores into a widely accepted new business model accommodating both these components.

This research also projected resource-based view, VRIO framework and knowledge-based view to identify '*hundred plus years of agronomy experience'* as the sustained competitive advantage of Yara. This agronomy experience is the tacit knowledge acquired by Yara over these years.

6.1. Digital Business Model

The data collected corroborates with the theoretical aspects of digital transformation. It is high time for all businesses to embrace digital transformation. This transformation journey will pave way to restructure the existing business model. The explicit outcome of this transformation enables companies to provide better customer value propositions. The research alludes to the fact that most of the corporates, irrespective of the industry, are on the path of this digital transformation.

The digital transformation is the shift from linear transactional channels to a circular dynamic relationship with the customer. Figure 11 shows the pictorial representation of an old and new business model (Tzuo, 2018).

Insert Figure 11 about here

As mentioned in literature review, for companies to incorporate digital into their business model, they must connect the five digital key elements: People, Business, Things, Data and Cloud. Value is generated when different digital elements interact with each other. In case of Yara, digital solutions are already available to farmers through mobile and web-based applications. Instead of developing new technologies from scratch overtime, Yara chose the strategy of acquiring many Agtech start-ups and even collaborated with big IT corporates like IBM. Chesbrough (2006) referred to these as value creation with new technology by either

incorporating technology into the current business or launching ventures that exploit technology in new business areas.

For example, if Yara sells fertilizers to farmers through a digital platform, then it becomes a digital business model. This explains the foremost objective of the study to understand the digital transformation of a traditional product-based company. My findings also reveal that digital transformation provides better value propositions to the end customers.

6.2. Service-Oriented Business Model

In reality, Yara has already taken the leap into services by providing necessary hardware devices and digital services to farmers. They collectively help in assessing data from farms to provide proper recommendations to increase yield and profitability. Most companies redesigning the business model, center their value creation around customer engagement and customer relationship. Competition and customer demands are factors driving companies to switch to a service-oriented business model.

According to Berman (2012), there are three strategic ways to digital transformation: focus on value propositions, change the business model or a combination of both approaches. It is also substantiated that companies that follow a combination approach will leapfrog their competitors in the industry later. In case of Yara, a combination approach is followed, focussing on better value proposition and redesigning the business model.

My verdicts show that value propositions are better implemented today with service-oriented business models. For example, if Yara sells digital services to farmers through an e-commerce platform, then it becomes a digital service-oriented business model. This explains the second objective of the study on how the new business model can incorporate both digital elements and service orientation at the same time. The findings of this case study show that digital transformation provides improved customer value propositions which are better implemented today with service-oriented business models.

6.3. Subscription Business Model

Let us consider the above example. A farmer comes and buys a digital service from Yara and he or she may or may not return to buy again. Thus, it becomes a one-time sales. To overcome this challenge and receive recurring revenues, companies need to incorporate the subscription business model. Subscriptions pave way in generating better profit and long-term

relationship with the end customers. Digital consumer subscriptions are erupting due to the continuous improvement in digital user experiences (Tzuo, 2018).

At a later point in time, Yara plans to bundle the fertilizers and digital services into a single package to be sold to the farmers. This may not necessarily mean that all the fertilizers produced by Yara will be sold as subscriptions, rather less than ten percent of fertilizer sales is expected through subscriptions. Even with this servitization, subscriptions prove to be a better business model. It is also revealed in this study that product-services package provide better value to customers.

My findings show that product-service package when sold as subscriptions, results in stable revenue as well as better value and better end customer relationship. This, in turn, addresses the third objective of my study to examine if the subscription business model proves to be a better business model in terms of revenue and customer relationship.

6.4. Service Reception

All the above said businesses will happen only if there are customers. It is important that customers have one or the other smart devices to be a receiver of digital services. For most businesses, the target market is emerging economies. The emerging markets in Asia represent huge opportunities for Yara. In countries like India, the majority of the population owns a mobile phone, but it may not be a smartphone.

My findings show that technology is not a barrier in emerging markets for providing digital services. There are many alternatives to reach these customers if they do not own a smart device. Hence, we address the last and final objective of the case study to investigate the acceptance of digital service reception in emerging markets.

One of the major limitations of this case study is that the results are based on a single case. The results would have been more generalizable by conducting a multiple case study focusing on product-based companies from the agriculture industry.

6.5. Implications for Future Work

This case study has a number of implications which can lay a good foundation for future research.

6.5.1. Theoretical Implications

- In this case study, I tried to build propositions from the collected data. As mentioned earlier in this paper, according to Eisenhardt (1989) framework, we need to carry out two more phases: enfolding literature and reaching closure. The theory generated needs to be validated against conflicting literature and we need to end this process upon attaining saturation. These two phases can be carried out as future research.
- The current research work is carried out as a single case study. This research can be further extended as a multiple case study focussing on more traditional product-based companies entering digital services.

6.5.2. Business Implications

- The theory points to the fact that the digital transformation varies with industries. Hence, it is important to identify the variations or similarities of these research findings with companies from various industries.
- Further research can also be focused on identifying the best attractive packages suitable for combining products and digital services.
- It is also important to do an in-depth analysis of the pros and cons of subscription business model in various industries.

6.6. Final Words

In this age of digital transformation, companies are trying different approaches to come up with the best-suited business model. The CFO of Yara Digital Farming said," *Many companies in other industries are in this experimental phase of testing. For example, Volvo selling subscriptions. One thing that is becoming popular is that you don't own a car, you buy in a pool of cars. So, when you need a car, you just enter the app and block the car. We are testing those service models in Yara."*

In essence, majority of the traditional product-based companies embracing digital transformation are stepping into customer centricity and service orientation. In this particular scenario, subscription model proves to be the best business model for the sales of product-services package. The continuous improvement of these services will attract customers and force them to be loyal to these companies enforcing a long-term relationship and ensuring a

stable revenue for the company. These customers will, in turn, receive better value by paying for the services they use and not for the products they buy or own.

Products are the past, services are the future. Theodore Levitt, Former Harvard Business School marketing professor once quoted, *"People don't want to buy a quarter-inch drill. They want a quarter-inch hole*." Every product no matter what it is, essentially provides a service the customer desires.

6.6.1. Business Model Redesign

We can choose to transform the business model of a traditional product-based company to any other business model. It may or may not be a digital or service-oriented model. Glancing through the strategy lens shows that all these kinds of redesigning the business model should be tactically executed with the best possible outcome. It should always be a win-win for both the customer and the business. With digital and service orientation being the trend of the hour, this study concludes that subscription business model turns out to be the best business model for a traditional product-based company making their primary step into digital services. An illustrative example of a subscription business model of a traditional product-based company is shown in the below figure.

Insert Figure 12 about here

6.6.2. Theory Building from Case Study Research

The Case Study research proves to be a valuable method in getting acquainted with a single case. Eisenhardt (1989) framework continues to be a priceless model in generating theory from the case study, especially for fresh research areas. Eisenhardt also encourages researchers to view the case from different perspective of multiple subjects.

In addition, interview guide helped to focus on the theoretical foundations formulated from prior literature. During the interviews, I tried to find if the data from one interviewee substantiated with the evidence from another. Eisenhardt (1989) also points out that if data from one source corroborated from another, the finding is stronger and better grounded. The framework also emphasizes that convergence of divergent data collection methods adds to the empirical grounding of the hypotheses, which I certainly agree to as part of this research study.

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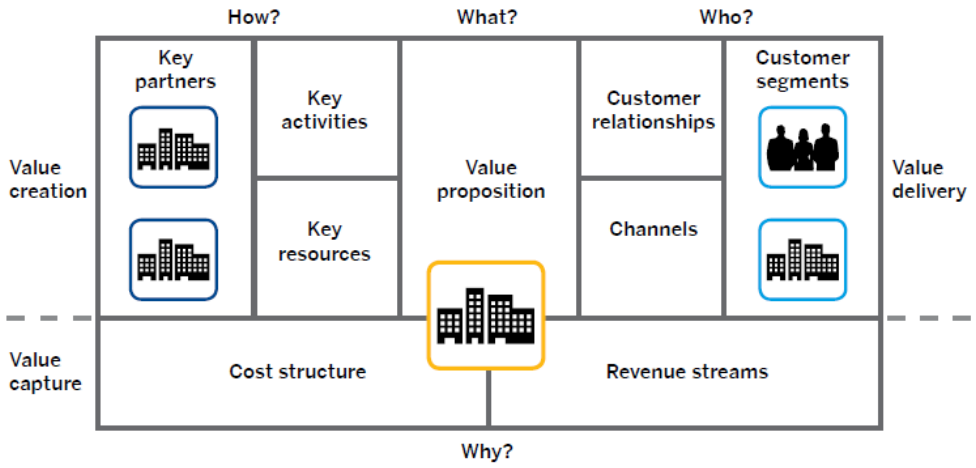
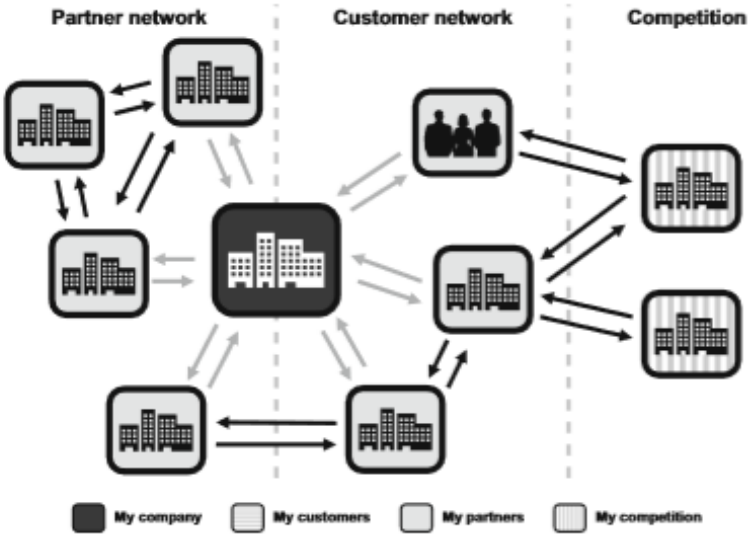
8. TABLES AND FIGURES

8.1. Figure 1 - Enterprise View: Business Model Canvas



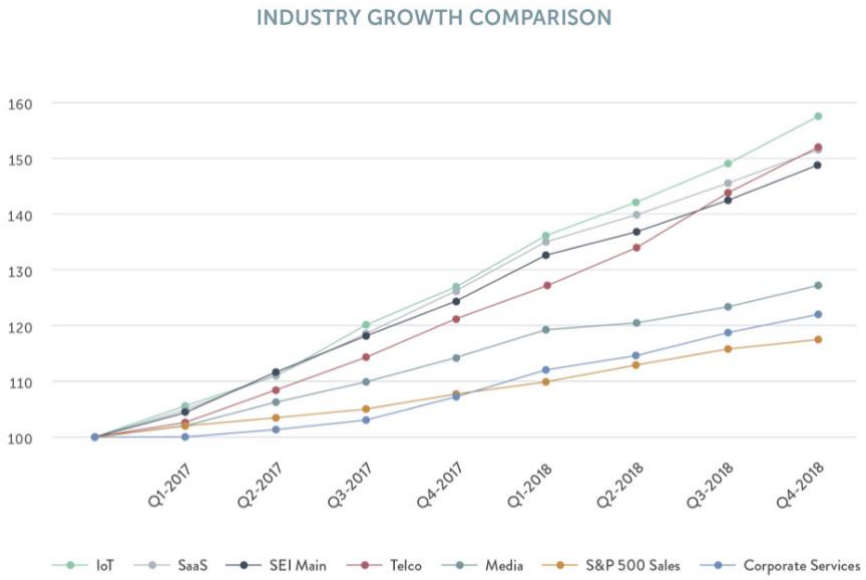
Source: Digital business modeling: a structural approach towards digital transformation, Cigaina, M. & Riss, U. 2016.

8.2. Figure 2 - Network View



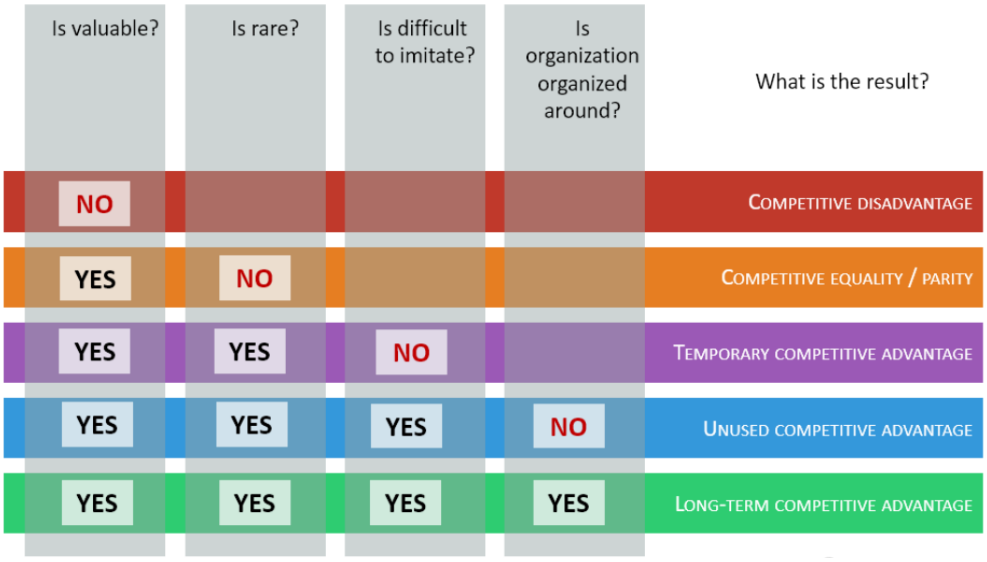
Source: Digital business modeling: a structural approach towards digital transformation, Cigaina, M. & Riss, U. 2016.

8.3. Figure 3 – Industry Specific Subscription Growth Rate



Source: Report - Zuora, Subscription Economy Index™

8.4. Figure 4 – VRIO Model



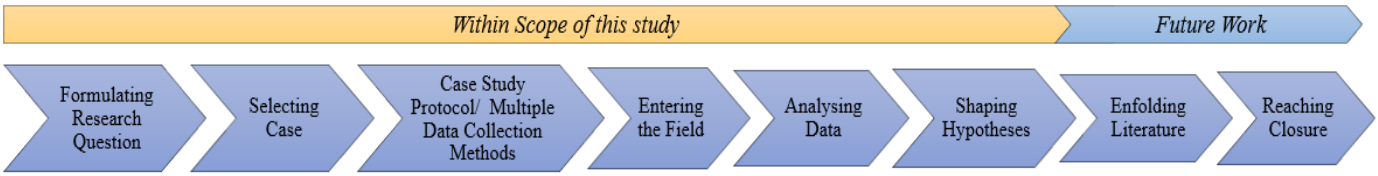
Source: Managementmania.com, VRIO Analysis

8.5. Table 5 - Relevant Situations for Different Research Methods

METHOD	(1) FORM OF RESEARCH QUESTION	(2) REQUIRES CONTROL OF BEHAVIORAL EVENTS?	(3) FOCUSES ON CONTEMPORARY EVENTS?
EXPERIMENT	How, why?	Yes	Yes
SURVEY	Who, what, where, how many, how much?	No	Yes
ARCHIVAL ANALYSIS	Who, what, where, how many, how much?	No	Yes/No
HISTORY	How, why?	No	No
CASE STUDY	How, why?	No	Yes

Adapted from: Case Study Research And Applications, Yin Robert K

8.6. Figure 6 - Case Study Framework



Adapted from: Building Theories from Case Study Research, Eisenhardt M. 1989

8.7. Table 7 - Positivism, interpretivism, and pragmatic epistemologies

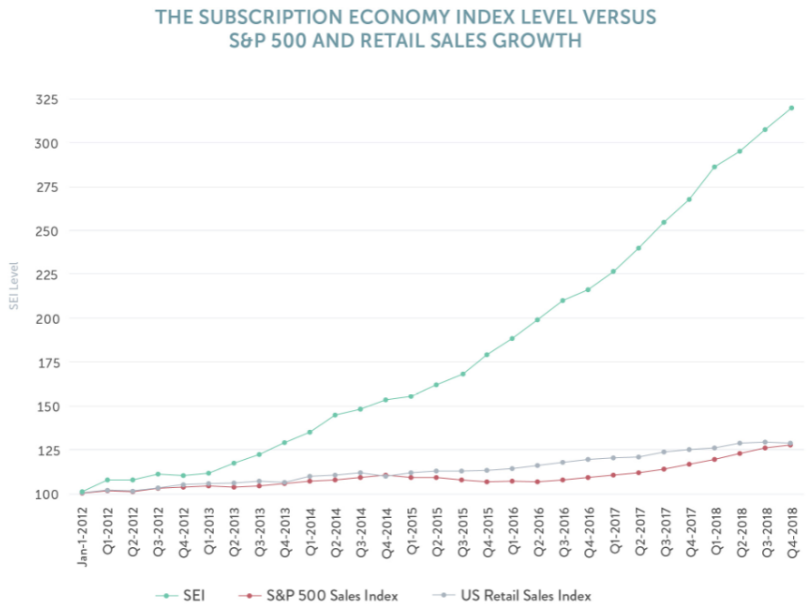
	Research Approach	*Ontology*	*Axiology*	*Research Strategy*
Positivism	Deductive	Objective	Value-free	Quantitative
Interpretivism	Inductive	Subjective	Biased	Qualitative
Pragmatism	Deductive/ Inductive	Objective and Subjective	Value-free/biased	Qualitative and/or quantitative

Adapted from: Essentials of Business Research, Wilson, Jonathan

8.8. Table 8 - Interview Subjects

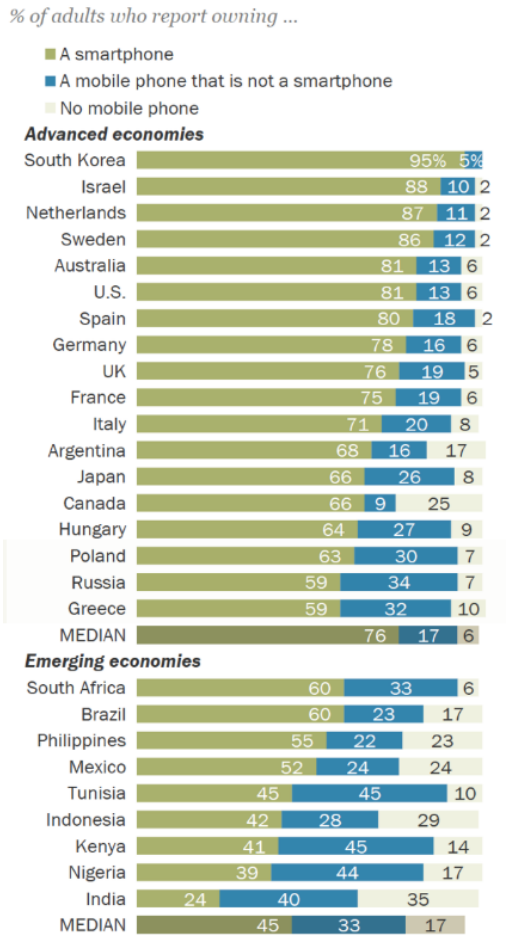
No:	Interviewee Designation	Company	Interview Date	Skype or Face-to-Face
1	CFO Digital Farming	Yara	2019-03-19	F2F
2	VP Digital Labs	Yara	2019-03-14	Skype
3	Director Commercialization- Sales & Marketing	Yara	2019-04-05	Skype
4	HR Manager- Sales & Marketing	Yara	2019-03-28	F2F
5	Business Relationship Manager	Yara	2019-03-20	F2F
6	Project Manager- DF	Yara	2019-03-20	F2F
7	Communications Manager	Yara	2019-03-20	Skype
8	Solution Manager-Smallholder Farmers	Yara	2019-03-19	F2F
9	Digital Product Manager	Yara	2019-03-22	Skype
10	Senior Manager- Digital Portfolio Management & Strategic Projects	Yara	2019-03-25	F2F
11	Client Director Digital Solutions	SNC Lavalin - Atkins	2019-03-25	Skype
12	Client Partner	Zuora	2019-03-26	Skype
13	General Manager, EMEA Regional VP Nordics	Zuora	2019-04-10	Skype

8.9. Figure 9 – Subscription Economy Vs S&P 500



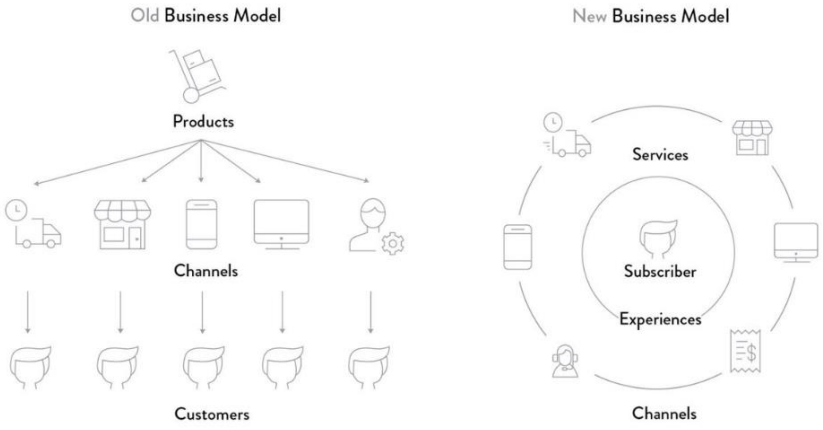
Source: Report - Zuora, Subscription Economy Index™

8.10. Figure 10 - Smartphone Ownership: Advanced Vs Emerging



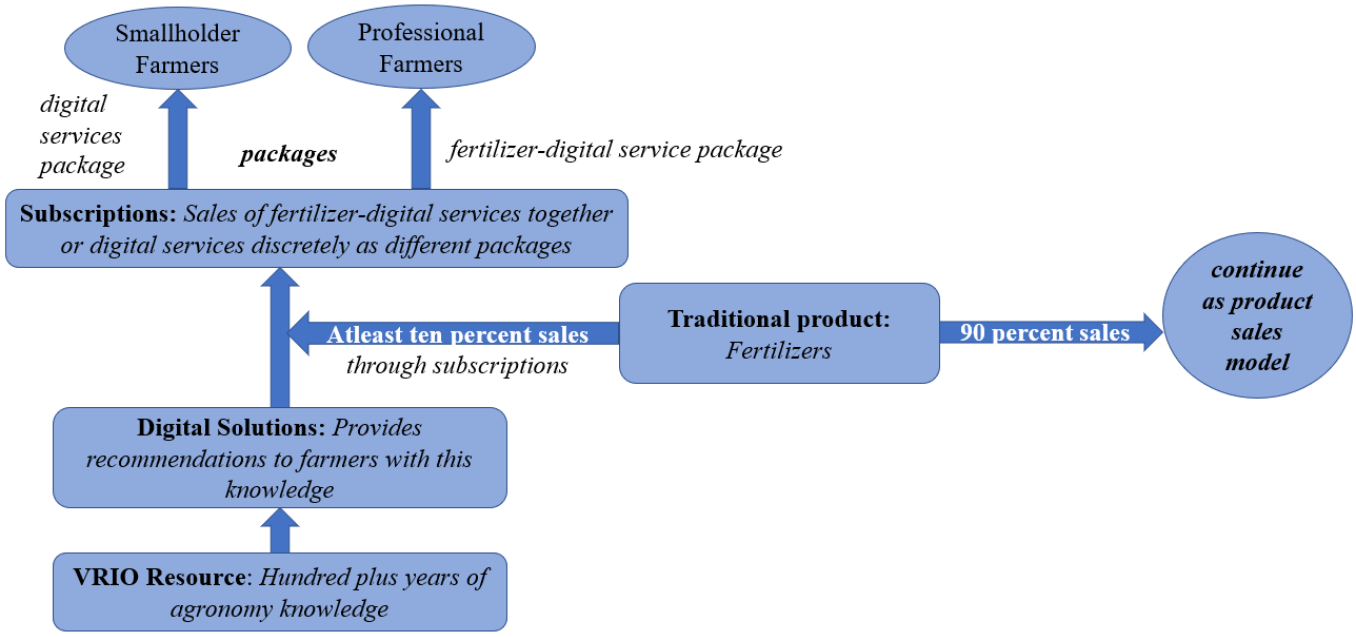
Adapted from: Smartphone Ownership Is Growing Rapidly Around the World, but Not Always Equally, Pew Research Center, TAYLOR KYLE & SILVER LAURA. 2019

8.11. Figure 11 – Old Business Model and New Business Model



Source: Subscribed, Tzuo Tien

8.12. Figure 12 - Illustrative Example of Yara Subscription Business Model



9. APPENDIX A – CASE STUDY PROTOCOL

1. **Research Question:**

   How to revamp the business model of a traditional product-based company to service orientated by embracing digital transformation?

2. **Theoretical Framework**

   - Business Model Design and Innovation (BMDI) methodology
   - Resource Based View: VRIO Framework
   - Framework by Eisenhardt: Generating theory from Case Study Research

3. **Unit of Analysis**

   - Digital Business Unit (Digital Farming) of Yara International ASA.

4. **Data Collection Plan**

   - Primary data: Semi-structured interviewees
     - Interviews of employees of Yara International ASA
     - Interview of employees working in digital services outside of Yara.
   - Observation of events in the Digital BU of Yara
   - Secondary data:
     - Data from open source 'Top successful companies on Fortune 500 List'
     - Zuora reports on the subscribed economy.
     - Yara International ASA website (www.yara.com)
     - Web articles on service-oriented digital business

10. APPENDIX B – INTERVIEW GUIDE

1.1. Theoretical Foundation & Concepts

Company:
Date:
Designation:
Location:

THEORETICAL FOUNDATION	CONCEPTS	QUESTIONS
Ebert & Duarte, 2018	**Digital Transformation**	• What do you think about the business being digital nowadays?
Remane et al., 2017	**Value Proposition**	• With digital transformation, do you foresee better value propositions to customers? Why?
Berman, 2012 Tzuo, 2018	**Customer Centric**	• How is business changing nowadays from product centric to be more customer-centric? • What do you think about participatory design with customers?
Blaschke et al., 2017	**Service-oriented**	• Are value propositions better provided today with service-oriented business models?
Lindgardt et al., 2009	**Revenue Model**	• How can we improve the revenue with subscription business? • What would be the compelling factors for customers to enroll for digital services?
Poushter, 2016	**Service Reception**	• What is your view on providing access to services through smart devices? • What do you think about the service reception by customers, especially in economically backward regions?
Kastalli & Van Looy, 2013	**Servitization**	• What do you think about selling 'product-services' as a package rather than products or services alone?
(Zuora, 2019a)	**Subscription Economy**	• How can we improve the revenue with subscription business? • What would be the compelling factors for the farmer to enroll for digital services?

1.2. Internal Interview Guide

(To be used within Yara)
It's important to know that you can withdraw from the interview at any time and you are also free not to answer any of the questions. If you have further questions about the investigation, please contact me.

We will also ask if it's okay to record the interview for transcription later. These will only be used for research. We will delete footage and transcripts as soon as the report is published (22.05.2019). Also, check if anonymity is preferred while quoting in the thesis.

Thank you for participating.

Questions:

1. What do you think about the **business being digital** nowadays? What is its impact on Yara?

2. How is business changing nowadays from **product centric to be more customer-centric**? What do you think about **participatory design with customers** (*farmers)*?

3. With digital transformation, do you foresee better **value propositions** to customers (farmers)? *Ambition, Curiosity, Collaboration, and Accountability*
   What do you think about having **separate value propositions for DF**?

4. Are **value propositions** better provided today with **service-oriented business models**? How will be the **service-oriented model** serve to Yara?

5. What is your view on **providing access to services through smart devices** *especially for farmers*? (*proximity*) What do you think about this **service reception by farmers** in various regions (*especially in economically backward regions*)? How can we overcome these kinds of situations?

6. How can we improve the **revenue with subscription business**? What would be the **compelling factors for the farmer to enroll** for DF services?

7. What do you think about **selling 'product-services' as a package** rather than products or services alone?

8. What would be the best way for Yara to **sell the fertilizer-digital solutions package**? How can **the bundle be presented to farmers in the most effective way**?

1.3. External Interview Guide

(To be used outside Yara)
It's important to know that you can withdraw from the interview at any time and you are also free not to answer any of the questions. If you have further questions about the investigation, please contact me. This research is conducted incorporation with Yara International ASA.

We will also ask if it's okay to record the interview for transcription later. These will only be used for research. We will delete footage and transcripts as soon as the report is published (22.05.2019). Also, check if anonymity is preferred while quoting in the thesis.

Thank you for participating.

Key Facts about Yara	Yara Revenue: 2018 Key Figures
• Established as Norsk Hydro in 1905, demerged as Yara International ASA in 2004 • **Industry: Chemicals/Fertilizers/Agriculture** • President and CEO: Svein Tore Holsether since Sept. 2015 • Headquartered in Oslo, Norway • More than 17,000 employees • Operations in more than 50 countries and sales to about 150 countries • **Largest business area: Production of Nitrogen Fertilizer**	Revenues: USD 13.1 billion EBITDA: USD 1.5 billion • Listed on the Oslo Stock Exchange • Norwegian government owns more than a third of Yara and is its largest shareholder.

Questions:

1. What do you think about the **business being digital** nowadays? What is its impact on agriculture?

2. How is business changing nowadays from **product centric to be more customer-centric**? What do you think about **participatory design with farmers** when developing digital tools in agriculture?

3. With digital transformation, do you foresee better **value propositions** to customers?

4. Are **value propositions** better provided today with **service-oriented business models**? How can **service innovation** be done in agriculture?

5. What is your view on **providing access to digital services through smart devices** *especially for farmers*? What do you think about this **service reception by farmers** in **economically backward regions**? How can we overcome these kinds of situations?

6. How can we improve the **revenue with subscription business**? What would be the **compelling factors for farmers to enroll** for subscriptions in digital services?

7. What do you think about **selling 'product-services' as a package** rather than products or services alone?

8. What would be the best way for Yara to **sell the fertilizer-digital solutions package**? How can **the bundle be presented to farmers in the most effective way**?

11. APPENDIX C – INTERVIEW INSIGHTS

	Interviews	Interviewee Designation	Themes				
			Digital Transformation & Value Propositions	**Value Propositions & Service Oriented Business Models**	**Products & Services as a package**	**Digital service reception by end users**	**Subscription business model and revenue generation**
Yara	1	CFO Digital Farming*	Able to help the farmers at a completely different level with digital.	Yara is stepping into being service oriented.	The obvious direction is to put services and products together.	Acceptance of technology might be less of a barrier in India.	The digital platform should quickly bring value to the farmers and they should be able to feel it in their pockets.
	2	VP Digital Labs*	By being able to directly interact with the farmer and transact with the farmer is a double transformation.	Better value propositions can be provided to farmers by being service oriented.	We need to figure out how to get the physical product to the farmers.	Technology learning is quite good, and they are not necessarily technologically backward.	It may not necessarily produce more revenue but will have a constant cash flow throughout the year. Predictable cash flows are better than lumpy cash flows.
	3	Director Commercialization-Sales & Marketing*	Not sure if in short term digital transformation will provide better value propositions as a lot of change management needs to happen.	Most of the digital tools offer a type of service.	Farmer wants to have something that will continuously provide value rather than a product that might be outdated soon.	Text message as a medium of exchange of information for farmers using base model phones.	Through subscription business, we have recurring revenue as compared to one-time sales.
	4	HR Manager- Sales & Marketing*	It is possible to provide better value propositions with digital transformation.	One solution alone cannot provide value, but we need to get to a point where we can sell more solutions.	From a customer perspective, it is very nice to get both products and services from the same place	If we manage to have a partnership with Telco, we can get access to farmers in emerging economies.	The farmers will certainly subscribe if the solutions offer value to them
	5	Business Relationship Manager*	It provides value but depends on the information	There is value for farmers by being	A few attempts are already done and are successful.	A smartphone is not needed to reach farmers, a base model	Increase value by recommending the most profitable

			provided to farmers.	service oriented.		phone can serve the purpose.	outcome for farmers.
	6	Project Manager-DF*	No transformation will happen without a better value proposition	There are some challenges due to the seasonal harvest.	Products and services together are better.	Pairing up with Telco operators and other companies that can take the services to farmers.	If there is a possibility to convince the recommendation and guarantee the yield, farmers will subscribe.
	7	Communications Manager*	With digital transformation, we can provide better value to farmers.	-	It is better to combine fertilizers and digital services.	Use knowledge transfer through base model phones or initially target innovative farmers with smartphones. Farmers can also be reached through sub-dealers.	-
	8	Solution Manager-Smallholder Farmers*	Digitalizing the whole ecosystem might benefit the farmers. If the farmer gets information about the market price of the crop, then he/she can negotiate with the middlemen.	-	It is always better to sell products and services together.	To identify how to communicate with farmers, investigate the whole ecosystem. Most smallholder farmers might have a phone but not a smartphone.	Subscription might work for professional farmers but not sure about smallholder farmers unless the relationship is with local Telco.
	9	Digital Product Manager*	Absolutely digital transformation can provide better value propositions.	Yara is in the right direction of innovating how to put the core business along with services.	Positive view	Depends on how educated and equipped the farmers are. European markets are better as compared to Asian markets.	Farmers will subscribe if Yara can promise better yield to farmers.
	10	Senior Manager-Digital Portfolio Management & Strategic Projects*	With digital transformation, we can reach those farmers who would normally not have the means to buy Yara fertilizers.	The farmer needs to know how and when to apply the fertilizers and the guidance throughout the entire crop cycle.	Better to combine products and services.	In certain regions, farmers don't have a mobile phone. Certain regions have one but don't know how to use it or might not have internet access.	It is not possible to value if you pay one-time and have a digital tool forever. Revenue and value to the farmer can be increased by providing various attractive digital packages with regular improvements and updates to

							farmers. And, also by bundling fertilizers and digital services.
External	11	Client Director Digital Solutions***	Using digital tools, we can provide better value to customers	Service-oriented business models are better than product sales model	It is better to combine products and knowledge together.	Farmers may not use smartphones in an effective way now but in the future, they certainly will.	Offer a broader prospect of products and services.
	12	Client Partner**	It is not important to transform into digital.	To deliver services are important and not digital or not.	Products and services as a package will be the future for all industrial companies	Customers will always include people who know about technology.	Revenue can be increased by optimizing acquisition, retention and pricing model in a subscription business.
	13	General Manager, EMEA** Regional VP Nordics**	If it is digital, it is more profitable and scalable.	Take a wrapping of all things that might provide benefit to farmers.	Take a journey with the farmers, one step forward with Servitization.	The receiver of the digital services might need a smartphone. Try to provide a smartphone package in cooperation with Telco.	Deliver strong customer experience to avoid churn. Companies run on subscription increased revenue nine times faster.

Companies: *Yara International ASA, **Zuora, ***SNC Lavalin Atkins

12. APPENDIX D – SECONDARY DATA

Company		Industry	Digital Business	Value Proposition	Service Orientation

1	Walmart	Retail	Digital retail	• Guarantee low prices
				• **Consumer satisfaction**
					• Money Services
					  ▪ Credit & Prepaid Debit Cards
					  ▪ Send & Receive Money
					  ▪ Gift Cards
					  ▪ Other Money Services
					• Product Services
					  ▪ Protection plans
					  ▪ In-home Services
					  ▪ Other Product Services
					• Business Services
					  ▪ Walmart for Business
					• Health Services
					• Registry Services
					• Auto Services
					• Pet Services

2	Ford	Automotive	Ford Smart Mobility	• Quality comes first • **Customers are the focus** • Continuous improvement is essential • Integrity is never compromised	Ford is coming up with FordPass, an aggregation of services. This will provide customers access to parking lots, car-sharing services and digital payment apps.
3	Apple	• Computer hardware • Computer software • Consumer electronics • Digital distribution • Semiconductors • Fabless silicon design • Corporate venture capital	Distribution of digital media	• Accessibility • Environment • Inclusion & diversity • Privacy • Supplier responsibility	Revenue record of $9.5 billion with iTunes, Apple Music, Apple Care, Apple Pay, the App Store, and iCloud services.
4	McKesson	Healthcare	Pharmacy Services & Technology	• Integrity • **Customer-First** • Accountability • Respect • Excellence	Provides services and tools to support specialties in healthcare to improve efficiency, costs and better patient care.

5	UnitedHealth Group	Managed healthcare	Exploring the potential of digital health care and develop solutions with consumer-centric focus.	• Integrity • Compassion • Relationships • Innovation • Performance	Continuously create products and services to improve the health care system.
6	CVS Health	• Retail • Healthcare	Ensure new members connect to digital tools from the beginning	• Innovation • Collaboration • Caring • Integrity • Accountability	An app which helps customers manage prescriptions. It includes mobile payment, ExtraCare offers, prescription information, and refill options.
7	General Motors	Automotive	General Motors Unlocks the Future of Digital Customer Journeys	• Continuous improvement • **Customer enthusiasm** • Innovation • Teamwork • Individual respect and responsibility	GM is providing 'AtYourService', a platform which automatically delivers offers to your car, by the destination point entered.
8	AT&T	• Telecommunications • Technology • Mass Media • Entertainment	Reimagine retail with AT&T digital solutions	• Live True • Think Big • Pursue excellence • Inspire imagination • Be there • Stand for equality • Embrace freedom • Make a difference	Full IT Services and telecommunication is provided.
9	ExxonMobil	Energy: Oil and gas	ExxonMobil is an industry leader in the development and application of technology.	• Career development • Climate policy principles • Diversity and inclusion • Health and wellness • Operational integrity • Respecting human rights • Safety and security • Workplace flexibility	
10	Amazon.com	• Cloud computing	Cloud and e-commerce	• **Customer Obsession**	Amazon provides a one-stop shopping experience with

		• Consumer electronics • Electronic commerce		• Ownership • Invent and Simplify • Are Right, A lot • Learn and Be Curious • Hire and Develop the Best • Insist on the high standards • Think Big • Bias for action • Frugality • Earn Trust • Dive Deep • Have Backbone; Disagree and Commit • Deliver Results	easy access to products, information, and delivery.

Source: google.com, Corporate websites