TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

NGUYEN DUC HAI

IMPROVING THE EFFICIENCY AND PROFITABILITY OF INDUSTRIAL CUSTOMER SERVICE

Master of Science Thesis

Professor Miia Martinsuo has been appointed as the examiner at the Council Meeting of the Faculty of Business and Built Environment on October 09th, 2013

ABSTRACT

TAMPERE UNIVERSITY OF TECHNOLOGY
Master's Degree Programme in Business and Technology Management

Hai, Nguyen Duc: Improving the efficiency and profitability of industrial customer service
Master of Science Thesis, 59 pages, 1 Appendix (2 pages)
May 2016
Major: Industrial Management
Examiner: Professor Miia Martinsuo

Keywords: industrial customer service, after-sales service, servitization, service efficiency, service profitability.

With the development of today's market, customer's demand is becoming more and more complicated. They are not only require well-manufactured products but also high level of satisfaction in the offered service. It is no doubt that aside from the race of technology development and innovation to make better products, there is another race that is even more active and competitive which includes customer service business. In industrial environment, the word-of mouth marketing based on customer service result might make the big difference between winning or losing millions USD orders. Hence most of manufacturing firms are turning their focus to customer service business. However, not all of them succeed in this transformation, actually due to the challenges in servitization process, many of the big organizations are struggling in doing their service efficiently and profitably.

This paper studies the customer service in industrial firms to understand the strategy and transformation process – the servitization, as well as the benefit and challenges of this process that organizations need to overcome. It will be the basement for further research on the main purpose of this thesis which is improving service efficiency and profitability of manufacturing company.

Outcome of this study are the suggesting frameworks for manufacturers to better organizing and developing their customer service. For academic purpose, this paper presents a systematic review of research on customer service and servitization in industrial world. For the case company, detailed analysis and suggestions based on actual working experience and developed framework from literature part will provide company's managers an overview of their service business and how to improve it.

PREFACE

This paper is conducted as the thesis study for my master program "Business and Technology" at Tampere University of Technology, Tampere, Finland. I chose the case company is my current work place – Hanoi transformer factory of ABB Vietnam, where I worked as a full-time project manager after coming back to Vietnam. The study is strongly related to the business of the case company and therefore is expected to be useful for the company's managers.

As doing research and working in a busy, multi-tasks job is very demanding, it is challenging for me to complete my thesis without the dedicated support from my supervisor, my colleagues and my family. Therefore I would like to reserve this part to express my sincere appreciation to my supervisor, Prof. Miia Martinsuo for her continual support and valuable advices and suggestions for my paper. Secondly, my great thankfulness goes to my colleagues, former service managers of Hanoi transformer factory: Mr. Trinh Mai Ngoc, Mr. Vinh Vu Quoc and current service manager, Mr. Manh Cu The as well as other service engineers who gave me detail answers and insight view into their daily work and service process. In addition, I wish there are some ways of showing my gratitude to all professors of my master program for their professional and useful training which is not only being applied into this thesis but also in my current job in global, industrial environment. Last but not least, thanks to my family and especially my wife who are always beside me and encourage me to do the research. Without you all, this work cannot be done.

Hanoi, 22.5.2016

Hai, Nguyen Duc

Contents

LIST OF FIGURES

LIST OF TABLES

.

1. INTRODUCTION

1.1 Background and motivation of the study

Companies around the world – whether giant local or global firms, especially manufacturing companies are investing more and more resources in research and development to deploy new products, new technologies and innovations. All these investments are spent to achieve the competitive advantage and market share in the "flat world". However, these innovations also make product's life cycle become very short and only the biggest companies can maintain their positions in this R&D race. In addition, Lele and Karmarkar (1983) stated that when the market is in its' early stage, customer focus more on technical features and performance of the products than support services, but in the mature market or old market where the technology is more or less fully growth, for example the market of transformers, circuit breakers, high voltage motors markets,…; customer needs become more complicated. Therefore, the companies have better customer services and achieves higher customer's satisfaction are most likely the truly winner in the market. In addition, after-sale services are an important differentiator because primary products are often physical comparable, while service is much more difficult to imitate and thus, become a competitive advantage (Heskett et al. 1997). Cohen et al. (2006) also stated that, being on par with your rivals in performance, price, and quality gets you into the game; after-sales services can win you the game. They also pointed out the underlying benefit when companies provide after-sale service support, in return, they can gain more understanding about customer's technologies, processes and needs, and these intangible assets can become competitive advantages over their competitors. In other words, service is more and more important when company wants to differentiate by marketing rather than product innovation (Miller 1987).

In terms of profitability, after-sales service provide a huge revenue source and recently has become increasing factor to offset the decline in primary product's profitability (Quinn et al. 1990; Wise & Baumgartner 1999).

"A business absolutely devoted to service will have only one worry about profits, they will be embarrassingly large!"
Henry Ford

Customers of manufacturing firms normally consider downtime failure cost and replacement of existing machines are much more expensive than repair and maintenance cost, thus, the price sensitivity of after-sales service is lower than primary product, following that, after-sales service will provide higher profit margin than original sale (Alexander et al. 2002). Moreover, during economic prosperity, customer might purchase more new machines, but in recession, they are more likely seeking for maintenance and repair solution for their existing ones. Thus, service can provide a buffer against the fluctuation in primary product market.

1.2 Description of the case

According to company's website, ABB (ASEA Brown Boveri) is a global leader in power and automation technologies. Based in Zurich, Switzerland, the company employs 140,000 people and operates in approximately 100 countries. ABB resulted from the 1988 merger of the Swedish corporation Allmänna Svenska Elektriska Aktiebolaget (ASEA) and the Swiss company Brown, Boveri & Cie (BBC), but its history spans over 120 years. ABB's success has been driven particularly by a strong focus on research and development. Today, ABB stands as the largest supplier of industrial motors and drives, the largest provider of generators to the wind industry, and the largest supplier of power grids worldwide.

ABB in Vietnam is part of ABB Group, established in 1993. ABB Vietnam recently has around 900 employees working in three regions across the country to ensure the nationwide presence of the ABB brand. The Head Office and transformer factory are located in Hanoi, High Voltage and Medium Voltage Power Product factories based in Bac Ninh province in the North of Vietnam, other branch offices are in Da Nang city in the Center and Ho Chi Minh city in the South. Through the years, ABB in Vietnam has proved itself as a reliable and competent technology partner to government, private and domestic sectors and become one of the most prestigious names in power and automation technology in Vietnam and many other foreign markets.

1.3 Research problem, objective and delimitations

1.3.1 Research problem

It can be seen obviously that company should focus on customer services to provide additional value to customer. However, in their research, Dougherty and Murthy (2009) found out that more than half of the customers they surveyed across industries say they have had a bad service experience, and nearly the same fraction think many of the companies they interact with do not understand or care about them. And on average, 40% of

customers who suffer through bad experiences stop doing business with the offending company. This statistic information shows that many companies fail in applying their customer services.

On the other hand, as Cohen et al. (2006) public their research on various large companies about their service, many of them have very poor service management. When they studied the service network of a giant automobile manufacturer in the United States, they found little coordination between company's spare parts warehouses and its dealers. And half of the time, customer need to wait for long time before their car can be fixed just because of spare parts lacking. Naturally, customer expect the product is good enough but for sure they know that it cannot be perfect and eventually need repair and maintenance, and when the product failed, every customer want fast response from manufacturer. Thus in this case, company is losing their customer's satisfaction in service.

Another part of their research shows that while original equipment manufacturers (OEMs) carry about 10% of their revenues as service sales, most of them do not yield so much benefit and profit from this portion; their inventory turn very slow and around 23% of their spare parts became obsolete each year. Other OEMs just want to do warranty in specific amount of time and let independent service provider take care of after-sales market and give away the opportunities of gaining more profit and extending their product-service chain.

It is not difficult to understand why industrial firms find it tough to manage their service. The main reasons including the unpredictable of service order, the challenges of much longer service sales and the wide spread of service network need to be organized, et cetera (Cohen et al. 2006). Therefore, the need of efficient service management system has appeared since the beginning of servitization era and became more and more necessary.

In addition, while many researchers and business developer agreed on the idea that service business generally offer higher profit margin than traditional product sales, not so many organization record their big growth in service profit. As Neely (2009) called it "Service Paradox" where a statistical analysis of more than 10,000 companies in 25 countries shows that while servitized firms generates bigger proportion of revenues, but in terms of profit margin, they actually make less than traditional manufacturing firms. Reinartz and Ulaga (2008) study on 20 leading industrial companies in various business sectors shows that while half of these firms report very positive profit margin on service, the other half is struggling with their after-sales business and barely make any profit from it. As a result, profitability development in service will need further study and research. There are quite many literature found in term of "pure service" sector's

profit but not so many focus on how manufacturing firms can improve their profit by providing service.

1.3.2 Research objective

While the study on service development and industrial servitization has long history over decades and more or less became mature recently, there are still many unsuccessful examples of manufacturer that failed to acquire the benefit of their service. Literature review and case company observation have result in several questions that the author would like to study further in this paper including:

- How manufacturing companies can manage their service network efficiently?
- How industrial organizations can utilize the potential profitability of service business?

The objective of this thesis is:

…building frameworks and suggestions to improve efficiency and profitability of customer service in manufacturing firm.

The author will analyze current customer service in industrial company with the case of ABB Vietnam as the empirical evidence, understand how they manage their services process and suggest better approaches to improve the efficiency and profitability of customer services in industrial environment.

1.3.3 Research delimitation

According to Kumar et al. (2004), industrial customer services can be classified into three groups by their timely difference:

- Before sales services
- During sales services
- After-sales services

This thesis although study industrial customer services in general but in order to provide enough detail analysis, in some parts, it will concentrates mainly on the after-sales services in business-to-business market and manufacturing environment which is the biggest and longest part among three groups above. Traditionally, after-sales services include the maintenance, service and repair (Markeset and Kumar 2003). However, with the evolve of the market, the increasing competition of new players and the more completed solution required from customers, after-sales services also need to be broadened to include more activities such as: installation, commissioning, training, spare parts

supply, product upgrade, online support, remote monitoring and warranty schemes (Goffin 1999 and Oliva and Kallenberg 2003)

1.4 Research methodology

In his paper, Gummeson (1993) analyzed different way to carry qualitative research with the case study including using existing material, questionnaire surveys, qualitative interviews, observation and action science. Each method has its' own advantages and disadvantages. Among these methods, action science which is the combination of other methods has the most advantage is the detail and reliable of data gathered. As Gummesson (1993) stated that action science is applicable to the understanding, planning and implementation of change in business firms and organizations.

Therefore, action science method will be used in this paper to have a better overall picture with enough detail. More specifically, the existing material related to company business such as company's website, annual report, public press…will be used as the secondary material to do research in the first phase. After that, based on the observation process as well as discussion and interview with service managers, service handling staffs, the author will gradually reveal and present the structure, function and service handling process of customer service business of the case company. This internal information source will create ideas about the possible suggestions to improve profitability of service business.

In addition, to have better understanding about company's service efficiency, the author will conduct a campaign to collect customer's feedback by face-to-face discussion during site and customer visits, phone interview and email send out to reach more customers. There will be 30 interviews in total in this campaign. The key customers are located in different geographic areas and various industries including utilities, electrical equipment companies, cement companies, paper manufacturers, car manufacturers, hotels, and hospitals. These customers were chosen based on the importance of continuous power supply to their operation, so that they will pay more attention to transformer service. The interviewees within customer's firms are mostly purchasers and electrical engineers who responsible for maintenance and operation of electrical substation. They are the people who know well about products and can provide valuable source to give idea and feedback on how to improve the offered services. The questionnaires form was developed from company's current customer feedback form with more detail and focus on four main categories including: the quality of products, sales process, delivery and after-sales process. The feedback results then will be summarized in latter part of this paper and become one of the main sources to suggest improvement for company and service managers.

1.5 Thesis structure

This paper includes five chapters. The first chapter is the introduction of the thesis, it presents the background for the research, the research problem and objectives as well as methodology will be used.

The next chapter reviews literature sources about customer service in business-to-business world with the focus on industrial manufacturing firms. First part of this chapter will summarize the concepts and definitions of service, customer service and after-sales service. The next part will present author's literature finding about various customer service strategies that can be applied into industrial companies. The last section in this chapter discusses the transformation from providing good to offering service – the servitization in manufacturing world.

Chapter three in this paper discusses about the efficiency and profitability of customer service in manufacturing world and how to improve these two categories.

The next chapter is the empirical part which analyzes the case company – transformer factory of ABB Vietnam, this chapter including general information about ABB Vietnam and its transformer factory, development history of its customer service department. The author will analyze organization structure and function of customer service of transformer manufacturing factory, providing suggestion based on literature model to improve service operation.

The last chapter will conclude the study by summarizing previous discussions as well as suggesting further study by opened ideas.

2. CUSTOMER SERVICE IN INDUSTRIAL WORLD

2.1 The concepts of service and after-sales service

The Oxford Dictionary defines **service** as *"the action of helping or doing work for someone"* or more specifically, *"The assistance or advice given to customer during or after the sale of goods"*

Kotler (1997) defines service as follows:

"Service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product"

Whereas, service is defined by Vargo and Lusch (2004) as the application of competences such as knowledge and skills through deeds, processes and performances for the benefits of another entity or the entity itself.

Gronroos (2000) stated that service is a process or an activity where a firm assist its customer by doing something and offering something of value. This definition is in line with Mathe and Shapiro (1993) perspective when they refer service as all of the activities undertaken by the firm to provide value in use over time, measured by increased customer satisfaction with a tangible product or series of products.

According to Teboul (2006) services can be classified into three main categories as shown in below figure:

- **Business-to-Business Services:** contains the activities and transaction between companies such as supply chain, distribution, finance, IT, and so on. With recent trend of outsourcing un-core business, there are more and more service providers in the field of legal advice, data processing, design, advertising, et cetera (Teboul 2006)
- **Consumer Services**: including health, education, banking, insurance services et cetera that sell service directly to consumer for their personal use
- **Self-services:** consumer replace provided services by their own equipment, activities such as washing machine, television, vacuum cleaner and so on.

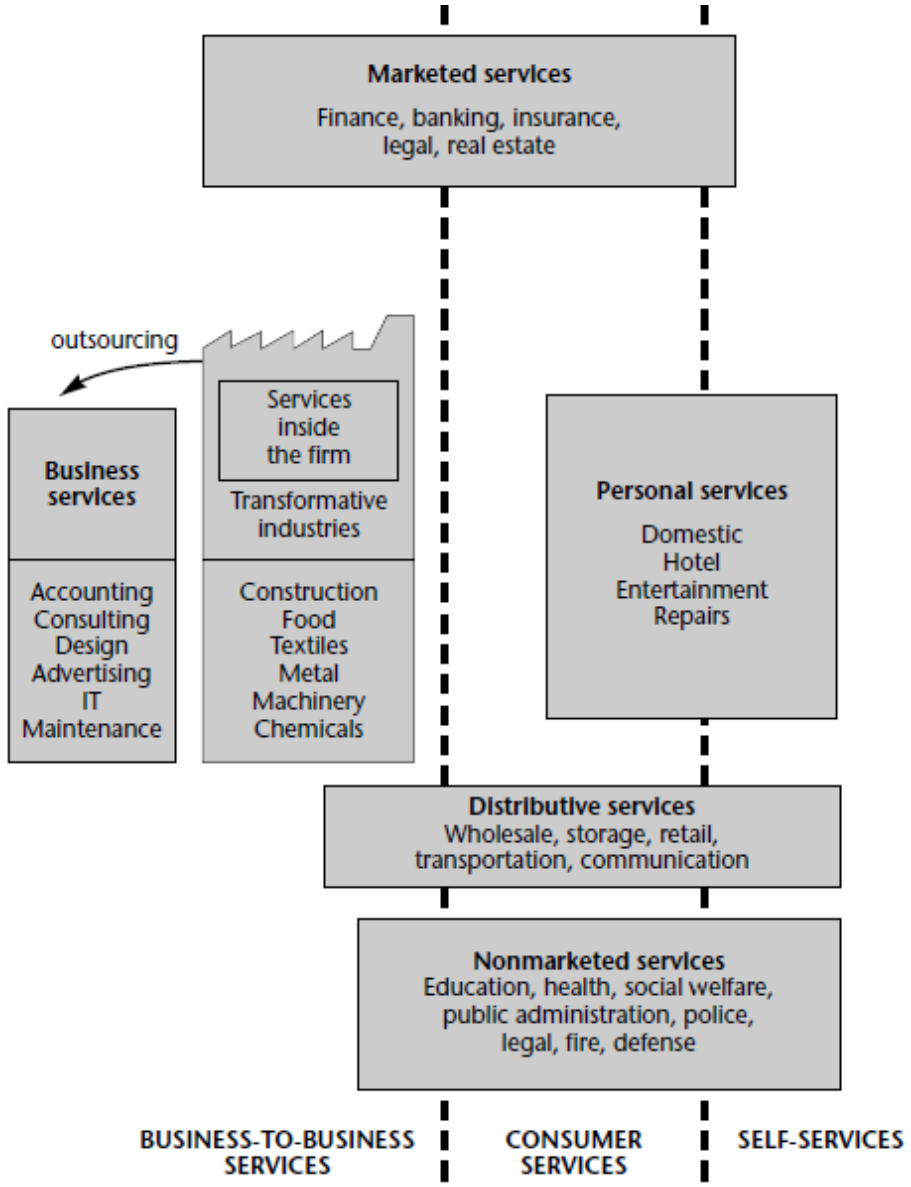

Figure 1. Service classification (Teboul 2006)

Teboul (2006) also presented a simple way to understand the product-service process by black-box method as illustrated in below figure 2, where the definition of product and service can be illustrated by the input and output of each process.

In case of pure product, the input is raw material and the output is completed products. For example, in transformer manufacturing, the input including copper, steel, accessories, porcelain, et cetera… and the output is finished transformer.

Whereas, in case of pure service, what come in is customer or more specifically, customer's request and needs, what come out is still customer but with satisfied solution.

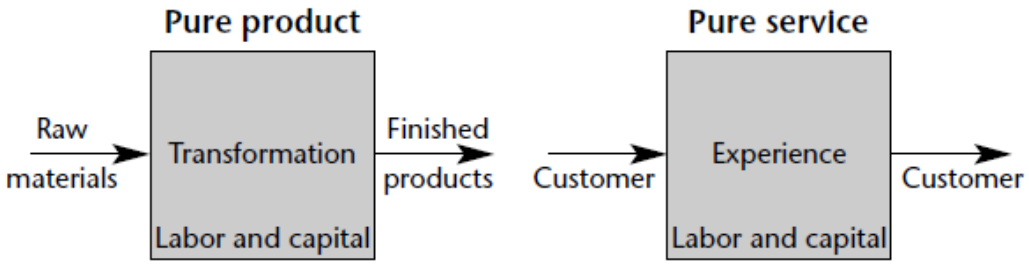

Figure 2. Pure product – Pure service by black-box method (Teboul 2006)

After-sales services is the term describing services that are provided to the customer after the products have been delivered (Vitasek 2005). Other literature also refer to after-sales services as "after-sales support" (Agnihothri et al. 2002), "technical support" or just "services" (Goffin and New 2001). Gaiardelli et al. (2007) define after sale service as those activities taking place after the purchase of the product and devoted to supporting customers in the usage and disposal of the goods to make them loyal.

Rigopoulou et al. (2008) summarized the literature on after-sales services and mentioned two broad perspectives as follow:

- With service providing companies, after-sales services are being treated as one of several supplementary service provided
- With manufacturing companies, after-sales services can be seen as operative activities of some or all member of the distribution chain such as transportation, installation, training repairing service.

In this paper, the definition of customer service presented by Lovelock (1991) below will be used:

"Customer service is a task, other than proactive selling, that involves interactions with customer in person, by telecommunication or by mail. It is designed, performed and communicated with two goals in mind: operational efficiency and customer satisfaction"

This is a broaden aspect of traditional customer service definition when all departments and personnel having interaction with customer (including the back office function such as design, quality assurance, supply chain departments and so on) need to take the role of customer service representative. In other word, the responsibility of making customer happy and improving efficiency of operation and customer service is given to almost everyone communicating with customer

In addition, the author will analyze industrial customer service or more specifically, after-sale service which can be placed in the line between traditional good and service due to its' dual characteristics: it includes tangibles such as spare parts, replacements,…

and intangibles in the form of tele-supporting, training, maintenance, installation activity,... In other words, after-sales service to some extend is the combination of good and service business. With current trend of developing this specific field, "the line that separates manufacturing and service has become more and more blurred" (Schmenner 1995).

2.2 Customer service strategy

Defining the strategy for each organization is the work which require input from its' stakeholders and its' own asset, capability. Specifically, in terms of customer service, the main stakeholder here is the customer with their requirement and service sensitivity. Whether customer is an easy going firm which require less resource from service team to satisfy them or they are very demanding one who need many things that not only require lots of effort from service team but also from the other back office departments.

Wouters (2004) classified customer service strategy based on service sensitivity and service sophistication as below table.

Table 1. Customer service strategy options (Wouters 2004)

Buyer / **Seller**	**High customer service sensitivity**	**Low customer service sensitivity**
High customer service sophistication	Customer integration	Logistical precision
Low customer service sophistication	Customer adaptation	Standard customer service

Customer integration

The strategy require high level of customer service performance from supplier and will created long term relationship with customer. Wouters (2004) suggested that in order to achieve this strategy, organization and customer need very good communication channel where short term and long term issues are discussed and resolved. High degree of integration between seller and buyer needed in this case to share their information and knowledge. Customer service in this case is considered very important to the firm and requires management involve frequently, and normally, there is a separated service department. Organization's structure also developed to provide the best support and most

efficient customer service by formal and informal communication channel and formats between service, logistics and sales & marketing departments (Wouters 2004).

Logistical precision

With some buyers who consider service delivery time, reliability and volume are the keys for their satisfaction but not require superior service quality, logistical precision strategy should be applied. This strategy although not focus on customer service sensitivity but needs high level of seller's service sophistication. Supplier firm need to have very smooth supply chain system in order to provide service within specific time frame, hence it requires efficient communication between purchasing, production, logistics and marketing departments. In addition, the connection with customer function is necessary but limited in logistic field, not as many integration as previous strategy.

Customer adaptation

When the market is sensitive to customer service, but the supplying organization is not highly sophisticated in terms of customer service, a customer adaptation strategy results. Company need to constantly adapt to customer need and continuously develop better solution in order to win the bid. High level of flexibility and improvisation skills is needed among customer service representatives to solve the routine works. It drains out company's resource very fast that they need to separate their service department not due to the development of their own strategy but to tackle daily request from customer.

This strategy in one hand will make customer happy as they get superior service from the firm but in other hand, it creates more demanding customer and the uncertainty within company by their reactive position.

Standard customer service

The last strategy discussed here is the standard customer service one, this strategy is adopted when both the selling organization's customer service sophistication and the buying firm's sensitivity to customer service are low. Firms follow this way normally work in project environment (Wouters 2004) and they focus on product development more than service optimizing. Their basic, low cost service can meet customers' requirement and being considered the add-on to their product offer.

In another approach, Lele (1986) divides customer service strategy into three main categories:

- Design related strategy
- Strategy that focus on service support system
- Strategy concentrate on reducing uncertainties

Design related strategy can be seen in three general activities:

- Focusing on improving product reliability
- Changing product design to enable its' modular characteristic
- Building on redundancy

Product reliability is one of the main concern of many customer, especially in business-to-business, industrial market while the failure of equipment can lead to the cost of shutting down production line resulting in a lot of loss for customer. Thus manufacturing firms are spending more and more resource to develop and improve their product durability and life span by not only more reliable design but also preventive maintenance and regular equipment checking. This aspect tends to be the most important aspect of customer service as perceived by customer (Quinn and Humble 1993).

Enable product's modular characteristic will shorten repair and replacement time if individual module broken. Service engineer can easily locate the fault and replacement can take place right away but another module/device from factory.

In business-to-consumer market, if the product fails, customer normally just purchase other product and do not lose so much money and working time, but within business-to-business market, the cost and time spend to purchase new equipment, loss time of production line or in sensitive cases such as aircraft industry, there is the need of back up modules if specific part of the equipment fails. Designing equipment with back-up module that can operate when primary module has problem will help manufacturing firm increase their product's value and usability, hence increase *redundancy*.

Strategy that focus on service support system tends to concentrate on shorten product failure time and reduce the cost that customer need to pay for their production loss time. It can be done via:

- Improving service system response
- Reduce repair service time

The *response time of service system* can be reduced greatly by 24/7 hot line available, increase number of customer service representatives who have the technical knowledge and authority to decide solution in shorter time, increase service coverage by locate service engineer near customer's site, develop special procedure for service engineer such as shorter travel request time, fast approval process, and so on.

In order to reduce *repair time,* service engineer need to be trained properly and provided enough tools and equipment so that they can solve the failure case at site without the need to ask for support from factory far away.

Strategy concentrate on reducing uncertainties will focus on quality development, longer warranty period and offering maintenance/service package to minimize the risk of product failure and increase customer risk management capability.

2.3 The good to service transformation – the industrial servitization

2.3.1 The need of servitization in manufacturing firms

When talking about servitization, it is usually being trace back to the work of Vandermerwe and Rada (1988) when they observed the trend of manufacturing companies all over the world started to add service into their offerings.

"Servitization is happening in almost all industries on a global scale. Swept up by the forces of deregulation, technology, globalization and fierce competitive pressure, both service companies and manufacturers are moving more dramatically into services" (Vandermerwe and Rada 1988)

In their paper, Wise and Baumgartner (1999) stated their view of new manufacturing strategy, pointed out that instead of only producing and selling goods, servicing was the new profit generator in manufacturing.

Vandermerwe and Rada (1988) brought out one of the main reasons for the industrial servitizing as the competitiveness of the market is raising due to the catching up of manufacturers in developing countries. With the spread out of technology and innovation, these new players were having easier time to follow and compete against developed countries' firms. Thus the development of industrial services has been proposed as an approach for manufacturers to gain competitive advantage.

According to Neely (2009):
"*Servitization* is the innovation of organization's capabilities and processes to better create mutual value through a shift from selling product to selling Product-Service Systems."

With Product-service Systems definition as:

"A *Product-Service System* is an integrated product and service offering that delivers value in use"

And Servitized Organization definition:

"A *Servitized Organization* designs, builds and delivers an integrated product and service offering that delivers value in use."

In their paper, Martinez et al. (2010) also pointed out that when multinational manufacturing companies based in Western economies realized the threat from Eastern competitors is raising, they have begun "shifting their market share from manufacturing to more product-service oriented systems". This shifting trend was described by Neely et al. (2011) in below figure.

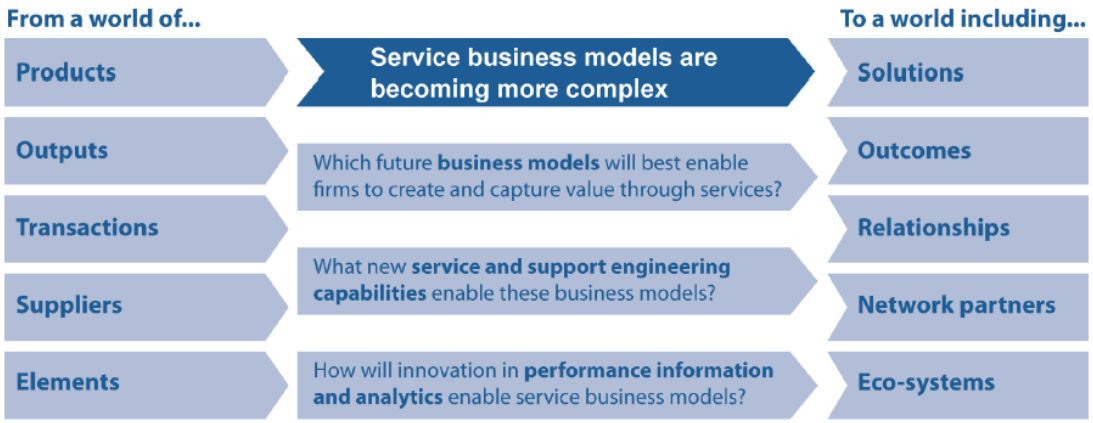

Figure 3. Describing the shift to services trend (Neely et al. 2011)

With their developed service business, companies are moving from providing products to complete "turn-key" solutions, from outputs to outcomes, elements to eco-systems, and so on. This trend is not mean to replace traditional products by solutions but rather providing supplement aspect to offered products to make it more attractive.

Some companies that have successfully managed a transition from products to services include multinationals such as IBM, ABB, Caterpillar and GE and in 1999, American manufacturers were reported to earned 45% of gross profit and 24% of total revenues from after-sales services (Cohen et al. 2006)

However, as the learning process was going, manufacturers in developing countries were also moving to follow the wave, they were adding more and more value into their "product package". This process was summarized in below table by Neely et al. (2011) when they study the servitization among different countries.

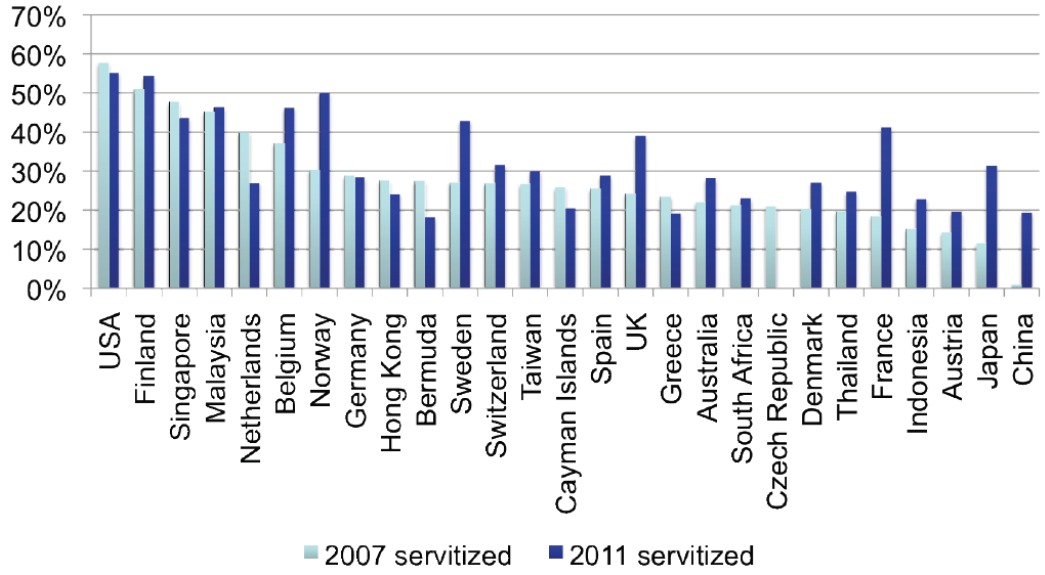

Figure 4. Servitization by country (Neely et al. 2011)

It can be seen obviously that in developed countries such as United State of America or Finland, there were high percentage of their manufacturers offered services from 2007 and there is little changes in this figure on 2011. However, the significant change was made in China when they started at almost zero from 2007 to reach nearly 20% in 2011. This shifting represents the trend of servitization in manufacturing firms and it is also clear that Chinese manufacturers did not want to remain as low cost workhorses for the world any more, they are trying to move higher in value chain. Hence the competitive situation among manufacturing industries will never disappear, it will remain and keep forcing individual firms to try their best to optimize their product and service in order to stay and gain market share.

2.3.2 Benefit and challenges of servitization

There are three main objectives that servitization can benefit manufacturing company including ***financial, marketing and strategic objectives*** (Mathieu 2001).

Financial objectives are belong to the main targets of all business, in this case, servitization bring out the chance to increase revenues and margins by opening potential, profitable business fields. Gebauer et al. (2011) presented that services are not only generally more profitable than the traditional product selling but also have lower risk revenue streams. In many industries, after-sale services contribute highest margins in the product portfolio and in some manufacturing firms; this business has grown to become four times the scope of original business (Cohen et al. 2006)

As services is the front stage between customers and manufacturers, its' ***marketing objectives*** are undeniable by improving companies image, customer satisfaction and retention (Saccani et al. 2007). For example, scheduled checking and maintenance service for transformers might save days of black out time for customers; especially in industrial zones, this saving will worth ten thousand of US dollars or more; resulting in longer life time of transformer hence more customer satisfaction in overall. These frequent activities also maintain company's brand name present and footprint in customer's area which is in some cases, surrounded by other potential buyers as industrial zones.

Last but not least, the ***strategic objectives*** being represented as long-term competitive advantage that customer service can provide for companies by its' nature of labour dependence and so, hard for competitors to replicate (Gebauer et al. 2011).

Another approach was discussed by Marks et al. (2011) about the benefits that servitization can bring to the firms including:

Satisfy customer needs

There are many ways to make customer happy and improving services is definitely one of the main strategy to boost customer's satisfaction. While traditional strategies including research and development for technological advanced product, reduce the price, provide new product's add-on et cetera take a lot of effort and resource; a new approach in service offering can bring up successful results. According to Davey et al. (2008), even market is experiencing down turn trend, prices can still be protected by emphasizing services portion within the offered package.

Enhance the firm's performance

Another objectives of servitization is to improve the firm's performance, as several literature papers revealed that, the margin of service in many industries are superior to that of original product. Davies et al. (2007) stated that services provide continuous revenue stream, have higher profit margins and require fewer assets than manufacturing.

The service oriented companies also grow faster in recent periods than pure manufacturing firms (Ren and Gregory 2007)

Achieve competitive advantages

According to Thompson (2000), in today's competitive market, firms need to look for new ways to differentiate themselves, attract share and grow, it can comes from understanding and delivering high customer value during process and service interactions. For the firms which already have high profile in product quality and price advantage, adding service benefits to their customers will make firms become harder to copy and

compete with. On the other hand, in the more mature business when products commoditize level is high, the need for servitization is also higher (Marks et al. 2011) and being considered a survival strategy for companies in the developed world (Slepniov et al. 2010)

Fast response to customer's call, superior and effective service brings a lot of benefit to customer and in return, it also benefits the manufacturer. Taking specific example with author's experience at ABB Vietnam recently, an utilities company bought a big transformer from our factory and delivered it to the site on November 2015, due to customer's lack of experience in handling oversized cargo, the transformer was major damaged during transportation. They were behind the energization schedule and faced the huge liquidated penalty. By author's closely corporation with other departments and high level of management commitment to support customer to resolve the case as soon as possible, ABB Vietnam managed to send service engineers to the site for damage checking by earliest flight and decided to return the unit to the factory for repairing and re-exporting in record time frame. Customer saved nearly 50,000 USD of potential liquidated fine and then, surprisingly, they realized the need of back up transformer for their substation and came back to us with repeated order right after that. In this case, our timely service did not only gain more revenue and profit in repeated order but also acquired customer's trust and loyalty which result in many forecasted orders in the near future.

Aside from afore mentioned benefits, shifting toward service strategy also has its' own drawbacks and challenges that manufacturer needs to deal with.

Table 2. Challenges of servitization (Neely 2009)

The Challenges of Servitization	
Shifting mindsets	Of marketing – from transactional to relational marketing Of sales - from selling products to selling service contracts and capability Of customer - from wanting to own the product to be happy with the service
Timescale	Managing and delivering years of partnerships Dealing with long-term risk Understanding the cost and profitability lying under long-term relationships
Business model and customer offering	Understanding what value means to customer, not producers Developing the capability to design and deliver services rather than products Developing a service culture Embedding all of the above into a service organization

Baines et al. (2009) focused more on organizational strategy and transformation perspective when they categorized servitization challenges into three main aspects as below figure:

Table 3. A summary of challenges in adoption of servitization (Banies et al. 2009)

Challenges in Adoption of Servitization	
Design	The difference between design of services and design of products. The managerial risk may out-weight the possible benefits
Organizational Strategy	Need to adopt necessary organizational structure and strategy that support customer alliance
Organizational Transformation	Need for service culture which is different from product culture Creating service-oriented environment and finding right people Internal resistance to change where new logic is not understood Thinking people as main assets Service paradox in manufacturing company related to organizational and cultural hurdles More complex customer needs and demands

According to the authors above, the design of service is different from design of traditional products, which lead to the risk of unsuitable or not matching in management and organizational structure perspectives. The firm structure and procedure can be very well built for production but might not suitable or need many changes in order to match service design.

In a strategy level, company's long-term goal and development plan will need to adapt to service-oriented targets. Aside from doing research and developing their own products, company now should focus more on soft skills training for their employee, marketing and studying customer's need in order to understand what service they need to offer to meet customers' expectation.

To overcome above challenges, every manufacturing firms need to go through organizational transformation process to changes their people, processes and structures. And when it comes to the changes, there is always the reluctance from internal parts. For example, making internal designer work directly with customer in a good communication and effective negotiation manner is a hard task as they are not used to it and do not want to be disturbed by some customer's continuous requirement to change.

The challenge of servitization is further enlarged by the unidentified outcomes of this process, even with strong supports as good results from other servitized firms, no companies can make sure from the beginning that it is the right time and right way for them

to servitize yet or not. And there are actually unsuccessful cases as statistic showing in below figure made by Neely (2009) which was called “The Services Paradox” while servitized firms generates bigger proportion of revenues, but in terms of profit margin, they actually make less than traditional manufacturing firms. The other part of the story reveals a scenario when the number of bankruptcies in servitized companies seems to be higher than in non-servitized firms.

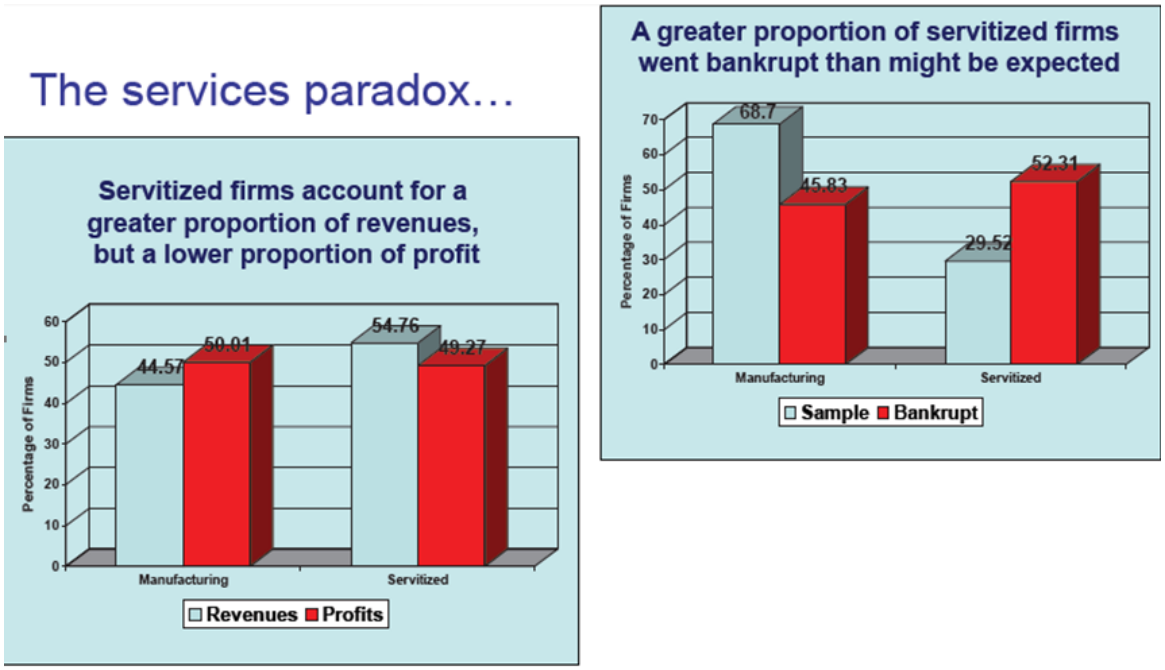

Figure 5. The Service Paradox (Neely 2009)

3. IMPROVING CUSTOMER SERVICE EFFICIENCY AND PROFITABILITY IN INDUSTRIAL FIRM

During the literature review of this paper, many different sources of reference were found with hundreds of study about how to serve your customer the best way, how to create the most effective customer service, how to make customer service one of your main competitive advantage and so on. However, not so many scholar refer to the internal efficiency of customer service and how to utilize this function. Company can obviously satisfy customer by providing superior customer service at high internal cost, for example, accept to support customer to do maintenance or repair for products which are already out of warranty period; accept to provide additional spare parts, devices which are not clearly stated in the scope of supply. These supporting can make customer happy and might benefit in the long term but also can push company fall into "The Service Paradox" mentioned in previous part of this study when they have financial difficulties or even bankrupt by uncontrolled cost.

Therefore, the main objective of this chapter is to study the efficient and profitable way to manage customer service in business-to-business context and industrial manufacturing environment.

3.1 Customer service efficiency

Martin (2013) points out six step for more efficient customer service including:

- **Take a top-down approach**

Company's commitment to deliver excellent customer service can be clearly seen from top management level involvement. When managers and company leaders were asked about their perspective about how they want their group, their company achieving in customer service, not hard to find many answers saying they want to do it, their ultimate goal is to create customer satisfaction, et cetera… But how good they perform in customer's point of view, we can refer back to figure 1 of this paper to actually see the summary of surprisingly low percentage of analyzed companies really got successful results in this aspect.

Therefore, taking top-down approach here means that managers will need to spend their time and effort of not only providing strategy and target but also actually involving in customer service process to see how their organization response to customer call and what need to be done better.

On the other hand, unlike B2C environment when customer's call or support needed in each case has small impact onto company's image and financial status due to the large amount of customer base and low value of each transaction. Customer's requirement in B2B market of heavy machinery or capital intense manufacturing usually result in thousands of US dollars transaction thus need manager's consideration and approval.

For example, transformer factory of ABB Vietnam has its' own service department with assigned Service Manager is a former manufacturing manager who has many years of experience with company and directly report to factory's top manager, this structure will assure the department and so the customer get the best support from top management level.

- **Ask for feedback (and actually use it)**

When working in customer service field, one of the most familiar paper that a representative will work with is the customer feedback form. This form if done properly will provide valuable source of information in customer's need and what they expect from the company in general and service team specifically.

However, as author's own experience when collecting customer feedback for service department after each service case, not so many customers really consider this form as an effective tool and really put their thought into it, they just fill in the form if we ask them to do so. There are some hidden reasons behind this behavior:

  - Taking feedback from wrong person: normally, the feedback was given by site engineer/field supervisor who know the product but are not decision maker in term of purchasing future ones. Also, customer site engineer's main duty is to keep the machine/production line going, so that whenever service engineer can fix the broken part, they do not care so much about other things.
  - Customer do not have the trust into company's response with their request/feedback.
  - Customer service representatives do not really emphasize how important the feedback form is with the company and customer.

- **Educate everyone, everywhere**

These front-line staffs has the biggest amount of interaction with customer (Martin 2013), thus they can make better company image by their responsiveness and effectiveness in solving customer's request. Aside from that, they also has the responsibility of

keeping company profit and cash flow by not spending too much resource to fulfill customer's need. Therefore, proper training for customer service personnel is essentially needed.

- **Create customer-centric system**

Martin (2013) stated that to change from in-focused systems, systems that works favorably for company but unfavorably for customer to customer-centric systems require many effort from the whole company. This transformation is part of servitization process that was discussed in previous part of this paper, hence it inherent all of servitization's challenge including shifting mindset, defining timescale and transforming business model, et cetera…

However, in order to remove the limitation preventing the development of customer service, companies need to overcome these challenge. Martin (2013) also suggested a way to create customer-centric system is using quality group or service-development team as a core to develop processes, procedures and encourage other service team members to take part in the transformation. Feedback from customer and service representatives is the valuable input for quality group to design the most efficient and suitable procedures.

- **Develop consistency in customer service**

When dealing with the same customer, there are normally different behavior or response from different service representatives in solving customer's request. These uncertainties might give customer a feeling that they are treated not well enough.

To avoid this situation, specific rules and standards need to be announced and followed within service firm to develop the consistency among their activities. There could be guideline, procedure in solving customer request and service representatives need to be trained to act in professional, systematic ways.

- **Recognize excellent every chance you get**

In order to promote their employee, Service Managers should consider this need and ways to fulfill it in:

  - ***A formal recognition program*:** it can be the reward from department, company, official announcement on company's website or newspaper. Physical reward in this case can include cash, vacations, and so on.
  - ***An atmosphere of informal recognition:*** everyday acknowledgement, casual cheering expressed by manager are very helpful in creating friendly, joyful working environment for their employee. It can be in the form of thank-you notes, lunch out, sharing customer's complementary emails.

By looking for possible service efficiency improvements, the author has found some very useful frameworks from "pure-service" sectors that can comfortably applied to service development within manufacturing environment. One of them is re-drawn in below table.

Table 4. Ten building blocks of excellent customer service (Adapted from Fife 2013)

Ten Building Blocks of Excellent Customer Service	
Engage leadership	Dedicated and constant support for customer service improvement must come from top management and exist throughout all levels of the firm
Identify the customer	Understand customer and their needs is essential in order to provide suitable and expected service.
Organize business around the customer's needs	Service organizations should seek to design and fining business practice, to provide customers what they need in the manner they would like to receive.
Empower staff	Assign decision-making authority to your front line staffs so they can resolve problems, improves morale and engagement, speed up service delivery, and enhances customer satisfaction.
Set performance expectations	Service department should have clearly articulated customer service goals related to the service delivery speed, service quality, and customer satisfaction. These goals provide the basis for developing specific, measurable performance standards.
Train staff and management	Not only staffs but also managers need to be trained for both technical knowledge and communication, negotiation skills.
Collect and monitor data that will drive performance	Measurement can help manager to evaluate their organization's operation results and it will drive employees to deliver excellent customer service.
Continuously improve business process	Processes and procedures should be continuously checked and improved to eliminate inefficient activities.
Consistently exceed expectation	Even if the customer's request is not totally solved, they should feel that the process of interacting with company through customer service representatives exceeded their expectations and so have the feeling that service team did the best they can to support them.
Celebrate, reward and recognize excellent	Recognizing staffs who deliver excellent customer service helps to encourage their good work and reinforce desired behaviors within the team.

Another approach was developed by Cohen et al. (2006) that can be summarized in below table:

Table 5. Six steps for manufacturing efficient service network (Cohen et al. 2006)

Six Steps for Managing Efficient Service Network	
Identify which products to cover	Support all, some, complementary, or competing products.
Create a portfolio of service products	Position service products according to response times and prices.
Select business models to support service products	Use different models for different products and life cycle stages.
Modify after-sales organization structures	Provide visibility, incentives, and focus for services.
Design and manage an after-sales services supply chain	Decide location of resources, prioritize resource utilization, and plan for contingencies.
Monitor performance continuously	Evaluate against benchmarks and customer feedback.

- **Identify which products to cover**

Company can decide either they will do service for all the products they are selling or just parts of their product portfolio. This decision reflect company differentiating strategy, as Cohen et al. (2006) pointed out, many PC companies such as Dell or Hewlett-Package support all of products they are offering but discontinue to support the products they have stopped manufacturing. Some business offer service package for their own product, but others provide support for complimenting devices or even for competing products. For example, ABB tends to provide one-stop solution when they decided to supports all the process control equipment in factories that have installed its automation systems. Refer to one-stop service solution, Cohen et al (2006) gave some question marks that companies need to answer before they choose this service covering range including:

- Do the products have anything in commons so that company's skill and knowledge can cover them with low cost?
- Do customer really want a one-stop solution?
- How critical is support to retaining customer?
- Will company's brand being affected if they service rival products?

- **Create a portfolio of service products**

Each customer require different level of customer service response, some need very fast support and willing to pay more to keep their equipment back to operation as fast as possible, some need fast support but not willing to pay more, some want to pay less by accepting for normal pace service. Dealing with these different customers requires different service offers to meet their demand and improve service's efficiency and profit. "Thus, instead of segmenting customers by sales volumes, geography, or technological capabilities, companies must create a variety of service products that meet customers' needs and willingness to pay. Service products usually range from those that are fast and expensive - platinum services, as they're commonly known to those that are slow and economic - silver services." (Cohen et al. 2006)

- **Select business models to support service products**

To serve different customer, companies not only need to provide various service products as mentioned above, they also need to choose and develop suitable business models to match. Cohen et al. (2006) stated that the business models that a company chooses are important because they affect all players in the services supply chain including manufacturer, service provider, logistics provider, and customer. The authors suggested multiple business model as shown in below figure.

SERVICE PRIORITY	BUSINESS MODEL	TERMS	EXAMPLE	PRODUCT OWNER
None	Disposal	Dispose of products when they fail or need to be upgraded	Razor blades	Consumer
Low	Ad hoc	Pay for support as needed	TVs	Consumer
Medium-high	Warranty	Pay fixed price as needed	PCs	Consumer
Medium-high	Lease	Pay fixed price for a fixed time; option to buy product	Vehicles	Manufacturer; leasing company
High	Cost-plus	Pay fixed price based on cost and prenegotiated margin	Construction	Customer
Very high	Performance based	Pay based on product's performance	Aircraft	Customer
Very high	Power by the hour	Pay for services used	Aircraft engines	Manufacturer; service provider

Figure 6. Models of after-sales service (Cohen et al., 2006)

Company can choose performance based model if customer do not own the product they use, for example in aircraft industry, airlines company pay GE and Roll-Royce for using their engines but not buying them. In other cases, ownership based model such as war-

ranty – pay fixed price as per contract for specific amount of service time, or ad hoc – pay for support as needed in the form of service order.

- **Modify after-sales organization structures**

According to Cohen et al. (2006), most companies do not pay so much attention on organizing their customer service. Consequently, the responsibility for service support is diffused, not centralized. When a customer's request come, it will be handled by different departments of the firm which take more time and complicated communication channel. If there is no leader in this matrix, then come the risk of un-solved request or low quality feedback to customer. This spreading also drains out company resource and working time.

In many servitized companies, their service department is separated and have their own organizational structure, with defined procedures and processes that tailored to customer-centric tasks.

- **Design and manage an after-sales services supply chain**

Due to the uncertainties and unpredictable characteristic of after-sales services, its' supply chain also different from traditional supply chain for manufacturing. Cohen et al. (2006) revealed those differences in below figure.

Two Chains Compared

Companies neglect after-sales services supply chains because they're tougher to manage than manufacturing supply chains. Their performance suffers by comparison, too.

PARAMETER	MANUFACTURING SUPPLY CHAIN	AFTER-SALES SERVICES SUPPLY CHAIN
Nature of demand	Predictable, can be forecast	Always unpredictable, sporadic
Required response	Standard, can be scheduled	ASAP (same day or next day)
Number of SKUs	Limited	15 to 20 times more
Product portfolio	Largely homogeneous	Always heterogeneous
Delivery network	Depends on nature of product; multiple networks necessary	Single network, capable of delivering different service products
Inventory management aim	Maximize velocity of resources	Pre-position resources
Reverse logistics	Doesn't handle	Handles return, repair, and disposal of failed components
Performance metric	Fill rate	Product availability (uptime)
Inventory turns (The more the better)	Six to 50 a year	One to four a year

Figure 7. Differences between two supply chains (Cohen et al. 2006)

Suitable service supply chain will determine the speed of service delivery and hence customer satisfaction. According to the authors, after-sales services supply chain has two hierarchies going parallel, based on the combination between these two hierarchies, organization can develop their service supply chain to best suit their various customer's needs:

Hierarchy of spare parts: contain different ways of break down a completed product into modules and submodules. If customer need to fix the problem in no time delay manner, then a completed back-up product should be available in company's stock. But if they only need to replace the failure parts in agreed time frame, then modules replacement is the option to reduce inventory level.

Hierarchy of locations: whether manufacturer stores their products, spare parts in their central stock (which normally far from customer site) or they can stock some spare parts in their local subsidiaries. Central stock option help to monitor the inventory and reduce the cost, but results in longer respond time to customer request. Whereas, local subsidiaries stock while increase the cost but provide shorter service time due to the low distance to the site.

- **Monitor performance continuously**

Monitoring performance of organization in general and service department specifically is required to keep up with the market changes. The primary target of this activities is to keep people and process on track so that they can maintain their efficiency level. The other goal is to catch up with the development of product and technology which will open up new ways of communication and support. Last but not least, tracking service's performance also helps company reveal new competitors with new service solution so that they can develop their service strategy to adapt.

➢ **Developed framework for improving service efficiency in manufacturing firm**

Combining above approaches and further research for literature source relating to improving service efficiency, a framework for improving service efficiency in manufacturing firm can be summarized as below table:

Table 6. Improving service efficiency in manufacturing firm

Improving Service Efficiency in Manufacturing Firm	
Ensure Leader's Engagement	Company's commitment to deliver excellent customer service can be clearly seen from top management level involvement. Without the engagement of leader and manager, any improving process will have hard time to be applied. Continued support from top management level through the whole service process will definitely give service representatives the encouragement to deliver excellent service to customer.
Empower Your Staff	Trained and high skilled staffs are valuable resource for company, in customer service, they are even more importance because they stay as the front gate between customer and company. The more decision-making authority your service staffs have, the faster responding time to customer's call achieved and the higher customer satisfaction acquired
Develop Service Portfolio	Company can consider their strength, weakness and review their customer database to develop suitable business model and service portfolio in order to serve their customer the best way without losing service profit. There is one thing that service developer needs to remember that all customers are not alike. There are always more important customers who need more resource and effort to serve, in this case, advanced and full service agreement should be made. While other small customers might only need reasonable response time at lower cost.
Monitor Performance	Measurement and monitoring can help manager to evaluate their service's operation results, makes adjustment on time whenever needed. Collecting feedback to utilize valuable source of information in customer's need and what they expect from the company in general and service team specifically. Having desirable reward system for service representatives will create positive impact on their job and improve team's performance.
Improve Service Supply Chain	Service supply chain is the key element for fast responding to customer's call. Whether service team has their own stock of spare parts and items or they shared factory's warehouse. Similar to service portfolio, different supply chain strategies can be applied to different customer and area including: • Fastest service delivery option with highest cost which applied to customers willing to pay more for their "no service disruption" – store completed back-up product at local stock near to customer • Agreed service delivery time with acceptable cost – store back-up modules at local warehouses • Long service response time with low cost – store back-up modules and submodules in central store

3.2 Customer service profitability

As mentioned previously, downtime cost in industrial environment is usually very high and customer do not expect their equipment fail in long period, they will pay for the service to get it fixed as soon as possible. Therefore, service business in manufacturing firm tend to be very profitable. The after-sales business can contribute up to thirty percent of total revenue and generates profit margins much higher than the sale of primary products due to the lower price sensitivity of after-sales services (Alexander et al. 2002)

During my research, finding suitable framework to improve service's efficiency is the difficult part but to increase service's profitability is just as hard. Especially when you are dealing with multinational organization, industrial corporation which has long development history and currently at their market leader position; their organization structure and cost-profit model was normally optimized with little room to improve. However, if managers of these companies would like to improve their service profitability, they still need to follow the basic frameworks and gradually find their way up.

Schreter (2008) presents three simple steps to improve profitability as below:

Table 7. Three simple steps to improve profitability (Schreter 2008)

Three Simple Steps to Improve Profitability	
Cut out unprofitable products and services	Why you need to keep running business that give you negative cash flow? In some cases, it is necessary to keep the footprint in the market or to keep operation running in low order time. But for sure companies cannot afford to keep this strategy going for long time. Losing money is still losing money whatever the reason behind is. Thus managers need to carefully review their services portfolio to decide which services are unprofitable and eliminate them if possible.
Target new customer from within groups	Big organizations can provide their products and spread their services all over the markets to improve their brand coverage and increase the sales revenue. But in terms of profitability, focusing on specific market area and group of customer will reduce the operational cost and hence, increase profit.
Outsmart your deadbeat customers	No company want to keep following long payment process with customer. The longer the process is, the more money and effort company will lose. Therefore advance payment and bank guarantee to secure the payment obligation are the ways to go if company do not want to chase their customer.

Another study done by ServiceMax organization in their white paper (2015) can be summarized in below table:

Table 8. 5 key steps to make field service profitable (ServiceMax 2015)

5 Key Steps to Make Field Service Profitable	
Just say no to giving away free service	Company or service firms might actually doing free service that they do not aware about it. Start charging the fee for all the service provided is a good way to gain profit margin.
Optimize scheduling	With global manufacturing firms, their customers are all over the world and normally, travelling time of service engineer to the site is longer than the actual working time at site. By better schedule arrangement, service manager can save a lot of travel time and cost, hence raise the profit
Never lose part. Ever	For field service organizations that service high value equipment with expensive parts, this step is especially critical. Company should make sure they can track their parts inventory across the entire service lifecycle. By not losing parts, and knowing what's been used, what is on-hand and what is need to order, firms can control their inventory effectively and save cost.
Market better. Sell better	More sales will result in more revenue and usually, more profit.
Go. Mobile	Field service is an inherently mobile job, thus mobile tools are required. Smartphones, tablets or laptops will enable your service representatives to work everywhere, every time which result in efficient work and savings

In their research, Reinartz and Ulaga (2008) has pointed out four steps to sell your service more profitable including:

- Recognize that you are already a service company
- Industrialize the back office
- Create a service-savvy force
- Focus on customers' process

Within these steps, key questions and key goals was advised by the authors as below table:

Table 9. The path to profits in industrial services (Reinartz and Ulaga 2008)

	Recognize that you are already a service company	***Industrialize the back office***	***Create a service-savvy sales force***	***Focus on customers' process***
Key questions	How do we currently sell services across business units and countries? What are the best practice inside our business organization? Which services can be moved from free to fee?	Which services are profit drain or money - maker? How can we ensure cost-efficient service process? How can we tailor services to customers' needs?	Is our sales force ready to promote services along with products? Can we explain the benefit of our services to customer? Are we willing to move to longer sales cycles?	Can we address customers' problem historically? Are our offerings aligned with customers' goal and needs? What future expertise do we need?
Key goals	A list of services we are currently offer Revenue from easily chargeable services A senior executive who oversee services development capability	Standardize services process and control mechanism Service platform flexible enough to fit specific customer context	Service-selling know-how or separates sales force Incentive system that promote services sales Tools for documenting value and communicating it to customers	Detailed descriptions of core customer concerns and operating process A shift from activity-based to outcome-oriented performance indicator A checklist of capabilities needed to compete in new services business

- **Recognize that you are already a service company**

Many product companies are providing services, they just did not realize it yet, Reinartz and Ulaga (2008) has stated this point in their paper which might be surprising with many managers. Company's manager will argue that they for sure know when their company started their service department and started their after-sales service work. However, what underline this statement is the additional portion of service that compa-

ny is doing just for free and both parties (customer and company itself) do not even recognize the existing and value of these portions.

But to realize what can generate more profit under company daily routine work is not an easy task at all, luckily, by reviewing different practices from various giant firms, Reinartz and Ulaga (2008) suggest that big organization can utilize its' multinational and multi-division advantage by assigning top manager and development team to observe, nominate and develop the best practices among its' service departments. By comparing current practices between service firms, development team can find out what they are doing for free now, hence provide the strategy to develop these activities to become service offers which generate more profit.

- **Industrialize the back office**

When studying the German manufacturer of printing machine, Reinartz and Ulaga (2008) found a story behind their high internal cost service. Their customer can choose between two service offers: pay-as-you-go offer (which customer pays for each time service engineer visit them and for replacement parts) and full service contract (when both parties have a warranty contract cover all possible failure and replacement). The authors found out that customer chose full service contract more often and within this group, as they do not need to worry about the cost each time, they call for service support much more usually than pay-as-you-go customers. What interesting here is that, manufacturer's service engineer also lose the sense of cost saving as they assume that all costs were covered in the full service contract, they go to the field more often and replace failure part faster without the need to check or repair it first. In this case, full service contract will generate less profit than pay-as-you-go service because of the higher service delivery cost required.

To avoid high service delivery cost, Reinartz and Ulaga (2008) advise three ways to industrialize the back office as follow:

- Flexible service options should be available for customer choosing, in which, full service contract will need to be costing with higher margin than pay-on-you-go service to balance their costly delivery. Long warranty contract should be less preferable than short ones. This approach is in line with Cohen et al. (2006) advice on building different business model to fit with different service needs mentioned in previous part of this chapter

- Continually monitor the cost of service processes to identify profit drain. This is again, similar to performance monitoring suggestion from Cohen et al. (2006). This activity usually require separated development group or expert to have their own view of current process.

- Shorten the transferring time of process innovation into service organization to minimize the cost hence gain more profit. The faster company applying process optimization tool, the better performance its' customer service will have and the longer distance they create with their competitor.

- **Create a service-savvy sale force**

In traditional manufacturing environment, when company consider their service strategy as the add-on for their primary product, obviously, their sales people will handle the service sales part as the additional task for their job. In this case, even the profit margin of service order might be higher, but the revenue of service sales often quite small compare to original product sales (for example, transformer factory of ABB Vietnam has annual product revenue around 50 million US dollars, while its' service revenue is only around 1.5 – 2 millions). Whereas, one of the main Key Performance Indicator of sales person is sales revenue, hence not hard to predict that they will focus mainly on product sales to generate more revenue and consequently, forget or not paying attention on services sales opportunities.

In addition, there are differences between selling product and services as services require longer sales cycle and the sales process is often more complex and strategic (Reinartz and Ulaga 2008). Even the sales man or field service support engineer are very good at understanding and selling primary product, they might be not well equipped to directly enter the services sales force yet, because they normally contact with customer's purchasing leader who focus on cost saving or customer's site engineer who see the service package as the competitor to their current job. Thus selling services need different approach to reach company owner or production manager who can realize the benefit of service offer to their production line reliability.

- **Focus on customers' process**

When manufacturer moving further in servitization process and managed their service delivery in a cost-efficient way, and there is little room to increase profit by optimizing their own process, it is the time for them to move their focus to customer's process and structure. However, more responsibilities usually go along with more risk and difficulties. When company commit to solving a customer's problem, it assumes a much higher risk (Reinartz and Ulaga 2008). Whenever customer want to transfer their maintenance job to service provider, there is automatically risk transferring occurs, as now, company not only need to take care of their own products but also to maintain customer's equipment in customer perspective. Therefore, their customer service system need more resource and new business model to tackle new challenges and nullify new risks.

The more company understand about customer's process, the more suitable solution they can come up with to offer to customer. In this aspect, service is the way to enter customer's organization and increase their switching cost, in other word, customer will depend on manufacturer more to solve their problem.

One-step service provider model discussed in previous part can be applied here when firm offer support service for all customer's system and equipment, not only their own products. This way, if the primary product offer cannot get customer to buy, company has the second chance to enter customer's area by providing maintenance and trouble solving service.

- **Developed framework for improving service profitability in manufacturing firm**

To be concluded, the framework of Reinartz and Ulaga (2008) is more about strategic view and solution, while ServiceMax's suggestions focus on practical aspects in operational levels, and Schreter's framework is the mix of these two directions. The developed framework below will be used in the later part of this paper to analyze current service business in the case company and suggest improvements:

Table 10. Improving service profitability in manufacturing firm

Improving Service Profitability in Manufacturing Firm	
Review and charge	Company leader will need to realize that they are already selling service and start to analyze their service's activities to find out which are the unprofitable parts to be eliminate; which hidden services can be turned into profit generators
Optimize service process	Optimizing service process in every possible way: • Improve back office professional support and awareness of the necessary of customer-centric attitude • Schedule your site service smarter to reduce travel cost, increase service engineer's productivity and raise your profit • Arm your service engineer with the best mobile tools so that they can solve the case at site without the need of factory's support
Improve service selling	Create and develop your eagle service sales team specifically to selling service. They need to be well trained and get enough support from the other department to gain more service orders
Turn attention to customer's process	Extending your service arm and service life cycle by focusing on customer's process. This way, company will not only increase revenue in service sales but also improve their technical knowledge, brand coverage and the dependence of customer into service solutions.

4. THE CASE STUDY

4.1 ABB – A global leader in power and automation technologies

According to Group's official website, ABB was formed in 1988 from the merging between BBC (Swiss) and ASEA (Swedish) firms, with over 120 years of history and the global present in around 100 countries and revenue recorded in 2014 is around 40 billion USD.

Figure 8. Where you can find ABB technology (ABB Group presentation 2015)

Above figure illustrates the wide spread of ABB's technology and solution in many area from home & office applications to agricultural machines and industrial services and products. As a global leader in power and automation technology, ABB Group provides wide ranges of product, technology and service including:

- Control products and systems
- Drives
- High voltage products
- Medium voltage products
- Low voltage products and systems

- Motors
- Robotics
- Power electronics
- Transformers
- Solution for industries and utilities
- Instrumentation and analytical tools
- Service and support

With the long development history, ABB did not miss out the trend of servitization in industrial world. With the main customers are the giant industrial firms who purchase products and services worth millions of USD with long product life cycle (for example, normal transformer's life expectancy is around 50 years), the need for strong service support sector is naturally developed and received a lot of effort and investment from the group. As a result, aside from strong focus on research and development and advance technology, service is one of the main part of ABB business with four major corner stone offerings in table below:

Table 11. ABB's service offering (ABB Group's website)

Rapid Response	Repair Replacement Service agreement Spares and consumables Training
Lifecycle Management	End of life services Extensions, upgrades and retrofits Installation and commissioning Maintenance Replacement Service agreements Spare and consumables Training
Operational Efficiency	Advanced services Engineering and consulting Extensions, upgrades and retrofits Maintenance Training Service agreements
Performance Improvement	Advanced services End of life services Engineering and consulting Extensions, upgrades and retrofits Service agreements

ABB Vietnam is a part of ABB Group established in 1993, with more than 20 years journey which can be summarized:

- 1993: ABB set up a permanent establishment in Vietnam, with an office in Hanoi.
- 1994: ABB opened a regional office in Ho Chi Minh City and established a Joint Venture for manufacturing of distribution transformers.
- 1996: ABB opened regional office in Da Nang city.
- 1997: ABB extended JV license to include power transformers.
- 2002: ABB converted JV into 100% of ABB capital, named ABB Ltd.
- 2005: ABB started the export of transformers from Hanoi factory.
- 2010: Opened a new branch in Bac Ninh province (40km north east of Hanoi) with High Voltage and Medium Voltage factories.
- 2011: Opened Engineering Center to provide a high quality engineering package to customers and develop local competence

ABB is the world's largest manufacturer of transformers with over 16,000 employees working in more than 50 production facilities around the world. Transformer factory in Hanoi are one of the key ABB transformer factories. The factory was built in 1994 for manufacturing of distribution transformers along with the establishment of ABB Joint Venture. In 1997, the Joint Venture License was extended to include Power Transformers manufacturing. The initial idea of transformer manufacturing was to supply the domestic market, was expanded to include overseas markets, with the strategic drive for export of transformers manufactured in Hanoi factory to the South Asian Seas region in 2005. The transformer factory has now turned into a world class manufacturing facility that is developing a strong reputation in the region with export to many countries in Asia Pacific, serving satisfied customers from Australia, New Zealand, and Japan. Due to success in these markets, our recent exports now include orders and deliveries to the African continent. In 2013, more than 70% of the transformers produced in the transformer factory in Hanoi was exported to foreign markets, which shows great capacity of the factory to meet both domestic and overseas demand for transformers, and an increasing credibility ABB in Vietnam has delivered to global customers (ABB Group's website).

4.2 Customer service at ABB and ABB Vietnam

4.2.1 Customer service at ABB

Customer service of ABB is built on the combination of 700 years of manufacturing experience from all of its' partners (ASEA, BBC, Westinghouse, Stromberg, et cetera), the very deep technical knowledge allowing ABB to provides services throughout the transformer life cycle, from commissioning to recycling, for all brands and kinds of

transformers. With over 30 service centers and 1,400 service professionals worldwide, ABB's customer service in transformer offering:

- Advanced services: intelligent asset management that triggers the right actions at the right time
- Training: online training, factory training and on-the-job training
- Maintenance: it can be time-based or condition-based maintenance, including inspection and diagnostics, life cycle assessments and preventive maitenance
- Repairs: can be in the form of workshop repairs or on-site repairs
- Installation and commissioning
- Spares and consumables: including loose parts, sub-assemblies or complete finished products
- Engineering and consulting: identifies opportunities and solutions to improve system and equipment performance and regulatory compliance with reference to planning and specifications
- Service agreement: wide range of service offering to suit customer's needs

4.2.2 Customer service at ABB Vietnam

Customer service at ABB Vietnam is developed along with the growing of market coverage. The more transformer supplied, the more services needed to satisfy customer's need. According to the interview with Mr. Trinh Mai Ngoc, the former Transformer Service Manager of ABB Vietnam, from the beginning, when the number of transformer supplied is not so much and with the easy-to-reach of local market, service providing was not so complicated. Service was handled separately by different departments case by case. In other words, each departments within manufacturing unit in below figure such as production, design or testing assigned their resource (people and equipment) to fulfill the task upon receiving customer's request. If customer need installation supervising, design engineer and test engineer will go together to the site, if the transformer need to be fixed or checked for its trouble, test engineer and production engineer will do their job. However, when the number of transformer manufactured keep raising and the need of providing service for foreign market grows, separated transformer service department was founded on 2007. From that time, dedicated personnel and resource was trained and assigned specifically to response to customer's request. Below figure show the organization chart of Hanoi transformer factory (Power Grid Transformer - PGTR) which include four main divisions including Distribution Transformer (DTR) Opera-

tions, Small Power Transformer (SPT) Operations; PGTR Sales & Marketing and PGTR Services.

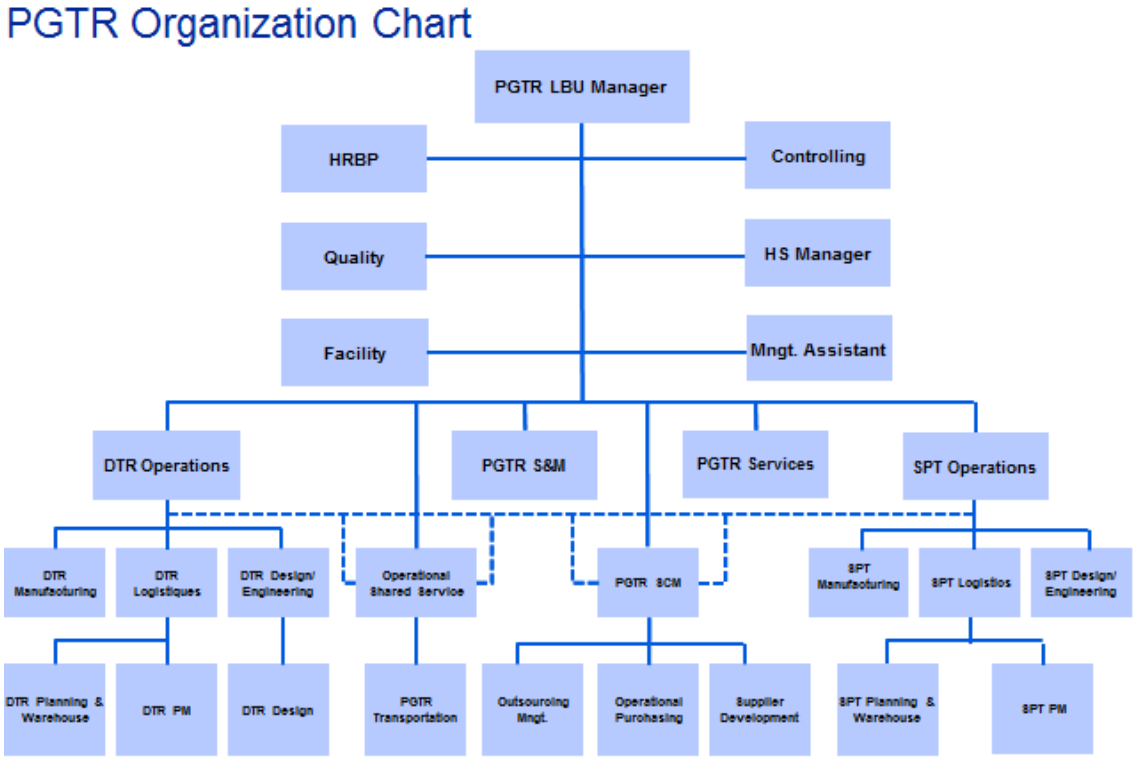

Figure 9. Hanoi transformer factory organization chart 2016 (ABB Vietnam)

➢ **Transformer service organization**

Transformer service department of ABB Vietnam currently has 12 persons including:

- Service Manager: responsible for overall and management activities
- 01 senior service sales representative: dedicated personnel for local service sales
- 02 handling staffs: responsible for office tasks of service department such as handling warranty claim, customer complain resolution process (CCRP), sending spare parts, doing custom clearance et cetera.
- 08 service engineers: trained technical staffs responsible for site activities, installation, supervision, repair, maintenance, technical support, training and so on. There are 07 service engineers based in Hanoi and 01 service engineer based in Ho Chi Minh city in the South of Vietnam in order for faster response to customer's requests in Southern market.

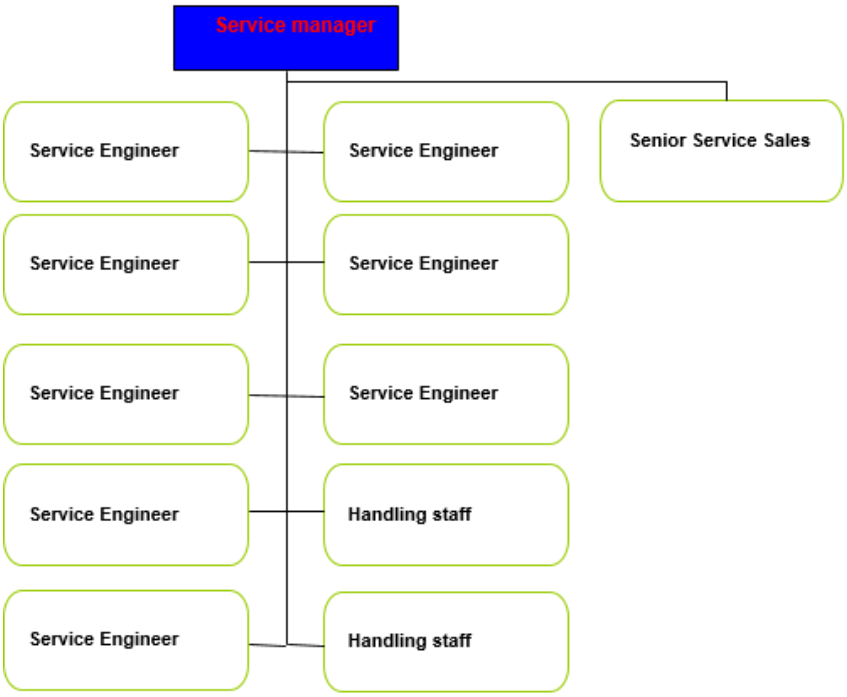

Figure 10. ABB Vietnam - Transformer service organization

In addition, for foreign markets, account manager (Sales & Marketing Department) in charge of each market area will take responsibilities of service sales for their own market.

On the other hand, whenever there is the support needed from service team in term of personnel or resource, factory will most likely provide suitable technicians and resource with the target of solving customer's request as soon as possible.

➢ **Transformer service function**

According to ABB Vietnam's internal procedure, the main functions of service department of transformer factory (Power Grid Transformer - PGTR Service) can be classified as below:

- *Workshop/factory repair*

The returned transformer for service are rectified in Transformer Workshop:

- Investigation and detailed inspection
- Overhaul/Revision of transformers
- Exchanging tap-changers
- New winding according to state of the art concepts / Replacing damaged parts of core
- Upgrading of power and/or voltage rating by adjusting the cooling system and changing of windings

- Works on tank and accessories (piping system) / new corrosion protection
- Testing of repaired transformer units according to international standards.

- *Field Service & Maintenance:*
  - Installation and commissioning.
  - Site test.
  - Annual/preventive maintenance service
  - Emergency service
- *Engineering Solutions*
  - This is special service that only ABB Vietnam can provide in Vietnam market.
  - The transformer footprint will be recorded in the factory (before shipment), at site (after unloading and before energization). It is repeated annually so that we can follow up the changing/aging progress of the transformer.

➢ **Service handling process**

Detail service handling process of transformer factory is shown in below figure

Table 12. Service handling process (ABB Vietnam – Internal procedure)

Item	***Description***	***Responsible***
1	*Clarify Request* Enter request in Log File Determine whether request is for Repair, Maintenance or New installation Collect all necessary information	Service Manager
2	*Assign Service Engineer* Check schedule/workload Select suitable Service Engineer Inform Service Engineer and hand over the project	Service Manager
3	*Compile Necessary Documents* Based on type of service and Customer's requirement, request and collect the documentation needed. Make a Safety Risk Assessment for the project. Identify Environment aspect and impact generate or potential generate from service activities	Service Engineer
4	*Call for Meeting/Agree on Technical Solution* If no clear/standard solution is suitable, call appropriate persons for meeting and agree on technical solution. If necessary, get approval from Technical Department	Service Engineer

Item	***Description***	***Responsible***
5	*Get Approval for Solution* Project manager (PM) service request: Solution is sent to PM for customer's approval Customer service officer/Front end sales/Service Center service request: Solution is sent to request department/person for customer's approval Customer's service request: Solution is sent directly to customer for approval.	Service Engineer
6	*Prepare Tools & Material* Based on type of service and information from Customer, prepare tools and material. Make plan, included tools or equipment to prevent or minimize impact to environment	Service Engineer
7	*Execute* Make Safety Risk Assessment on work site Make Site Assembly Inspection Execute service according to approved work instruction and Technical solution. Service to be discussed and make clear responsibility on hazardous waste treatment.	Service Engineer
8	*Make Report* Upon completion of service, prepare Service report. Make sure to note any: - Additional requests from Customer - Eventual pending items Get Customer's approval to Site Report Cost of poor quality capture: monthly and define root causes Return any unused material	Service Engineer
9	*Call for Evaluation Meeting (applicable for large project)* Update Service Report If deemed appropriate, call concerned parties to Evaluation Meeting Prepare report from Evaluation Meeting Distribute report to concerned parties	Service Manager
10	*Suggest Improvements* Based on report from Evaluation Meeting suggest actions for improvements to Technical Department/Production Department/Transport Department/Order Handling Department	Service Manager

Whenever a customer request appear, service representative will raise a service request to the system as below procedure:

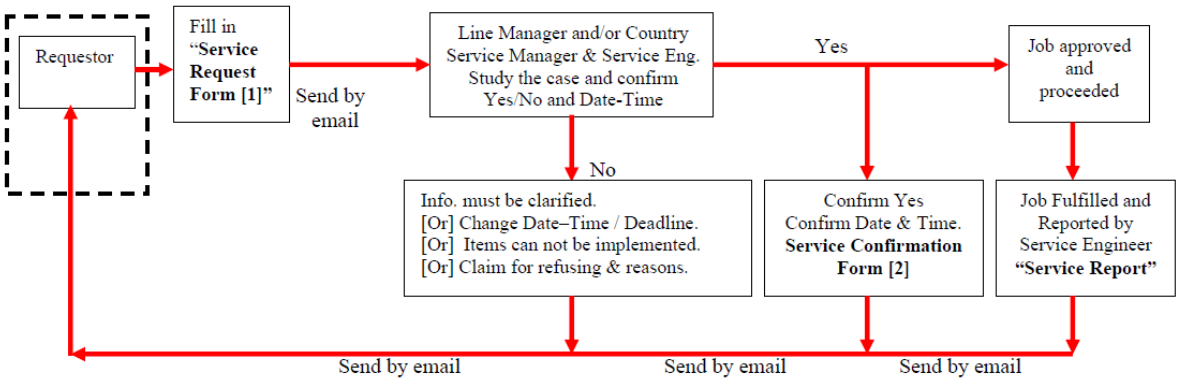

Figure 11. Normal service request procedure (Transformer Service VNABB – Internal Procedure)

This normal procedure applied for all service request but in urgent cases which email responding is not fast enough, special procedure as below figure will be used. The ultimate goal is to response to customer as fast as possible.

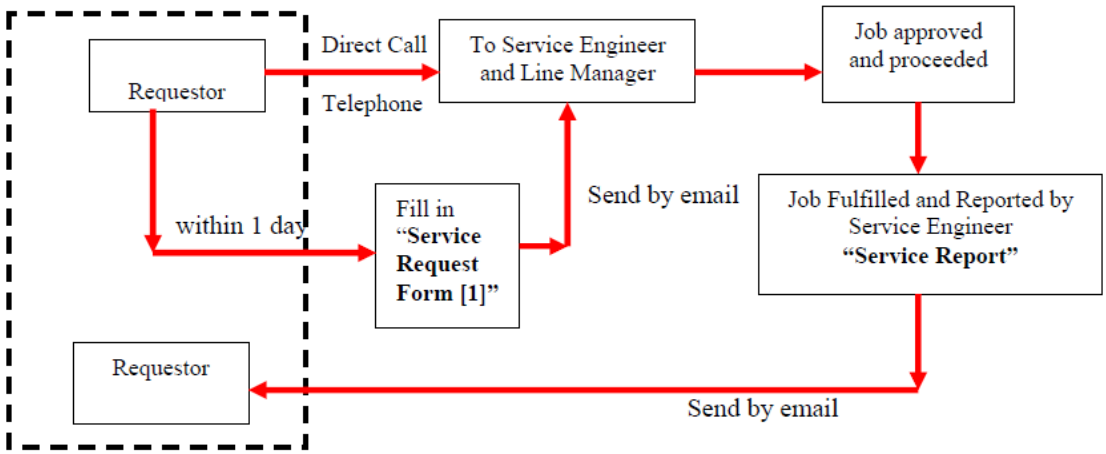

Figure 12. Emergency service request procedure (Transformer Service VNABB – Internal Procedure)

➢ **Problem of the case company**

In general, the overall service structure, function and process over view are quite clear and focus to deliver satisfaction to customer. However, as the result of collecting feedback campaign done by the author and observation's results during daily work and site visits. There are some aspects that company could do better in order to improve service business as following:

Problems related to service operational efficiency:

- ***Service response time:*** this is the main concern of various customers (Vina Kraft Paper, CALOFIC, AB MAURI Vietnam, United Engineers Vietnam) in their feedback forms: *"Response time is not fast enough, ABB should have more service engineer in Southern market"*
- ***Better customer training*****:** as feedback from customer at Thang Long Cement Plant: *"ABB should arrange training programs and invite customers to join"*
- ***Tools for service engineer:*** from customer at CENTEC company: *"Service engineer should have enough tools when they go to the site"*
- ***Service supply chain:*** service team is using the same stock warehouse with factory, sometimes, the spare parts are not available soon enough to meet customer's short notice demand
- ***Unpredictable demand:*** most of the time, the service request just raise up suddenly and there is not yet an efficient way to cope with this situation.

Problems related to service profitability:

- ***Warranty period was not tightly controlled:*** the start date of warranty period currently could not be determined exactly due to customer's unspecific energization schedule. Normally customer received hidden extra warranty time
- ***Sale force:*** service team only has one sale representatives recently been assigned, which is basically not enough to cover all sales opportunities. Foreign markets service sales being handled by Sale & Marketing personnel, and as discussed earlier, sometimes, selling service is not their main targets.
- ***Low revenue:*** according to company's internal report, the annual revenue of factory on 2015 is around 50 million USD while service only account for 1.5 million USD, which is not match with the potential of service business
- ***Advance service solution:*** ABB group has quite many advanced service solutions and technologies that ABB Vietnam could not apply yet, there might be the potential to increase the sales by providing superior service products that competitors in local markets do not offer yet.

In the next part of this chapter, developed framework from literature review part will be applied to suggest improvement for service operation within the case company.

4.3 Improving service efficiency and profitability for ABB Vietnam

4.3.1 Improving service efficiency for ABB Vietnam

In this part, the developed framework in service efficiency improvement from previous chapter will be used to suggest ideas for Service Manager and company's management team to enhance transformer service sector

- **Ensure leader's engagement**

From factory's organization chart above, it can be seen that company already pay attention on service department as it is one of the four main divisions and directly report to Local Business Unit (LBU) Manager – Factory top manager. However, there is still room for improving leader's engagement into service development here including:

- Scheduled meeting between managers (Service manager, LBU manager, managers of other departments) and service representatives (service engineer, service handling staff, project manager, front-end sales) for mutual understanding about current company's service and find the way to improve the current process
- Top managers might consider to occasionally involve into customer's complaint resolution process and follow the whole process to see what are the obstacles in handling customer's call and how to solve the case faster.
- Factory managers should arrange appropriate time in customer meeting to discuss about company's service to have customer's response and suggestion on what they really want from service team.

- **Empower staffs**

More training for service representatives will always be welcomed. As one of the most popular feedback from customer is that ABB Vietnam should improve English for their staffs, not only professional selling/servicing skills but also English and communication skills are really needed as company serving customer globally.

Appropriate language and soft skills training will not only needed for the staffs who in contact directly with customer (such as service engineer, order handling staff, sales people, et cetera) but also very important for back office staffs (including designer, quality engineer,...) because they will also have meeting with customer occasionally during customer's factory visit, design review meeting, customer's audit, et cetera. As author's own experience when conducting design review meeting with customer, our designer was having difficulty in explaining full detail of our design due to the lack of English proficiency and communication skills.

Service representatives to some extent should have more authority to decide solution for customer's request in order to response faster to customer's call. It can be defined in authority chart based on the cost impact of solution. For example, service handling staff can decide solution with the cost up to USD 1,000 or so.

- **Develop service portfolio**

During author's research for service efficiency and profitability development in industrial companies, it turns out that ABB is one of the global groups that focus a lot of resource on service development and service solution providing. ABB Vietnam should utilizes this advantage in using Group's resource in developing service portfolio.

As developed by ABB Global Consulting team, service portfolio can be defined and developed based on below table:

Table 13. ABB full service portfolio (Saba 2013 – ABB Global Consulting)

	Portfolio Activities	Definition / Scope
Performance Based Agreements	Operation & Maintenance	Operation & Maintenance is a long-term performance based on partnership agreements on Lump Sum and KPI for all Maintenance and Operation activities
	Full Service	Full Service contract is a long-term performance based on partnership agreements based on Lump Sum and KPI for all Maintenance activities
	Equipment Performance Management	Full service or Global Service of Maintenance related to the specifics Equipment (e.g.: Motor, Instruments.) based on Lump Sum and KPI
	Asset Management for Fuel Retail Stations	Global management of the activities directly and indirectly linked to the Maintenance of fuel retail networks and of the relevant services
Maintenance Management & Supervision	Turn-Around Maintenance (TAM)	TAM (Turn-Around Maintenance) consists in all the cyclical and also extraordinary strategic maintenance activities planned and managed during the stop planned production.
	Maintenance Management & Supervision	Maintenance Management & Supervision consists in the leading Maintenance workforce and supervisor of the work
Maintenance & Productivity Implementation and EEI	Maintenance & Productivity Implementation	Improve Overall Equipment Effectiveness, reduce Maintenance spend, optimize resources and stock inventory, minimize risk, root cause analysis, Failure Mode Effects and Criticality Analysis, Maintenance Management System implementation and management
	Energy Efficiency Improvement	Feasibility Study on electrical and thermodynamic equipment and implementation projects with performance based contract (EPC)

With current service activities at ABB Vietnam, transformer service should follow Maintenance Management & Supervision model for the majority of local customers (utilities companies) who require mostly supervision service during installation and maintenance service whenever their transformer has problem.

Full Service and Turn-Around Maintenance including proactive checking and maintenance service should be applied for key local customer, especially industrial customers who do not like to stop their production line due to transformer failure and electricity black out. Agreement can be made with these customer to schedule for proactive maintenance when they have planned to stop their production for checking.

With most of all foreign customers, Equipment Performance Management model should suit them the best as this agreement will cover global service activities including long time travel, work permit at destination countries.

➢ **Monitor performance**

During the period of working as thesis worker at transformer service department, the author conducted a customer feedback collection campaign (via face to face meeting and telephone discussion) and based on department's current feedback form, further detail form was developed (as shown in Appendix 1) in order to provide more accurate and valuable feedback to company's product and service team performance. Below figure shows the result of 30 feedbacks from main customers:

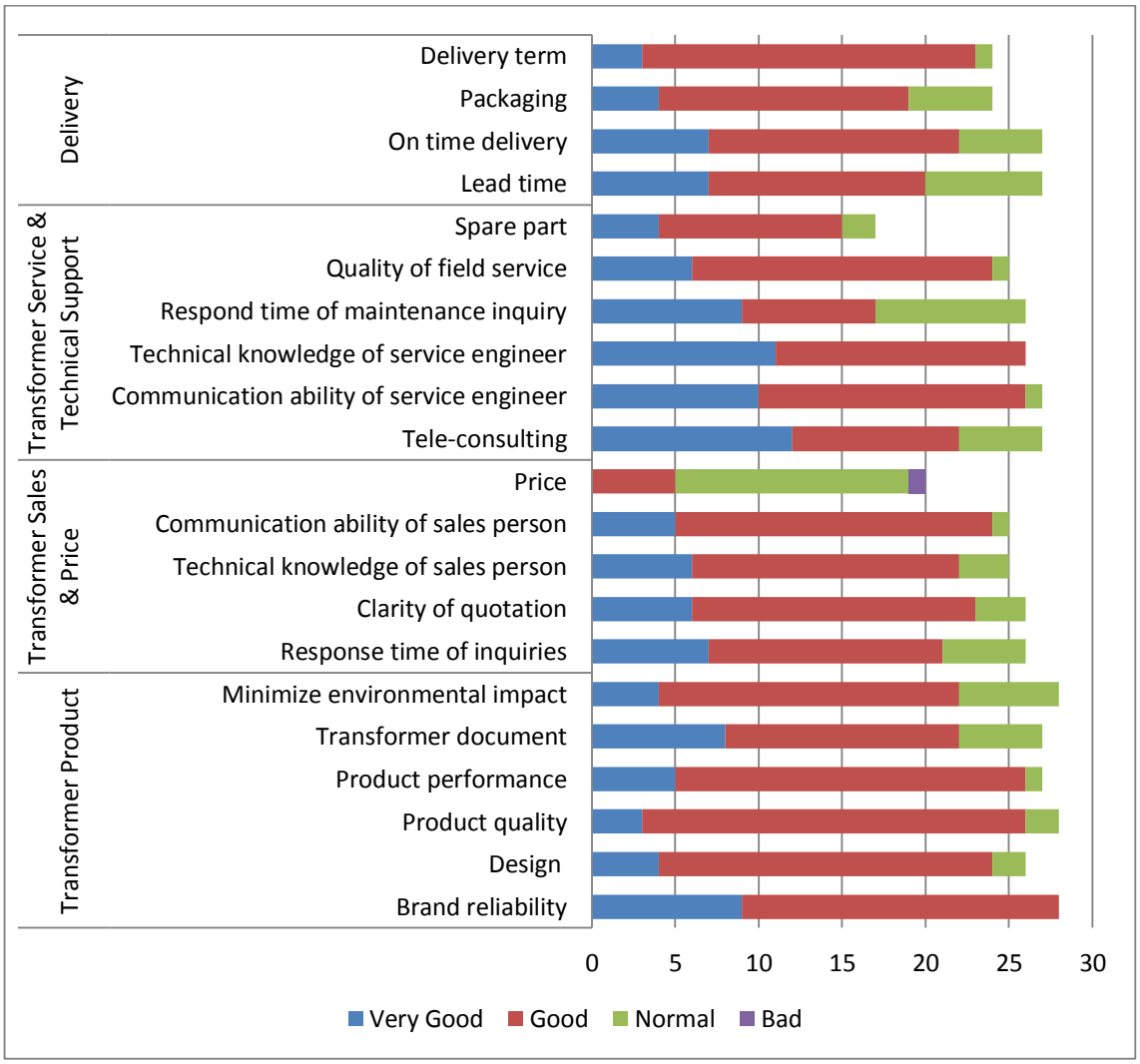

Figure 13. Result of customer feedback campaign 2013 – ABB Vietnam transformer service

The customer feedback campaign result shows that service engineer's technical knowledge and communication ability are appreciated by customer and they have little

to no negative feedback to these aspects, but the respond time to maintenance inquiry will need to be improved. In order to shorten response time to customer's call, a service representative was recently assigned in the Southern office to cover service request in that area. It should be ideally to assign service engineer in main foreign markets to provide urgent on-site support to customer. Responding time can also be shortened by higher stock of spare parts available.

Service engineers should consider taking customer feedback as one of their main tasks when coming to the site in order to continue monitoring service performance and to have better understanding of customer's need

In addition, service manager will need to pay attention on rewarding and recognizing to encourage service team member when they achieve good result in solving customer's call.

- **Improve service supply chain management**

Currently, transformer service department using the shared supply chain and warehouse with factory. This method might keep inventory level low and save cost for operation, but in some cases, the conflict in inventory priority appear between service spare parts needed and factory's production requirement.

Therefore, separated warehouse for main and most popular spare parts and items (such as gaskets, bushings, o-ring flange, et cetera) might be needed for service department so that they can control their own stock and provide support to customer faster.

4.3.2 Improving service profitability for ABB Vietnam

As discussed previously, improving profitability in current market leader business is not an easy task, however, there are always rooms for development when manager really want to spend their effort on. Based on developed framework in last chapter, below suggestions are made to propose more profitable approach for transformer service department:

- **Review and charge**

In order to review the service process, development team or expert will be needed. They will want to review current service activities and norms closely to actually eliminate unnecessary and unprofitable support. Service manager and service development team will need to study service practices at other ABB's factories to compare and decide which are the best practices to apply to ABB Vietnam.

One of the main profit improving sources based on author's observation is reducing the cost in hidden extended warranty period. The warranty term in the contract of selling transformer at ABB Vietnam states the period of time as follow: "warranty period will

be counted as 12 months from fully operating date but no longer than 18 months from delivery". And with working practice, due to the difficulties in getting correct operating date of transformer at customer's site, the warranty is normally counted as 18 months from delivery. This practice basically gives 5 – 6 months of free warranty for customer if they installed and operated their transformer right after delivery, it is almost 50% of warranty cost or even more due to the longer the warranty period, the higher the warranty cost needed as equipment tends to fail at the later time of their life span. In this case, service department or project manager will need to collect exact information about the operating time of transformer to start counting their warranty period accurately.

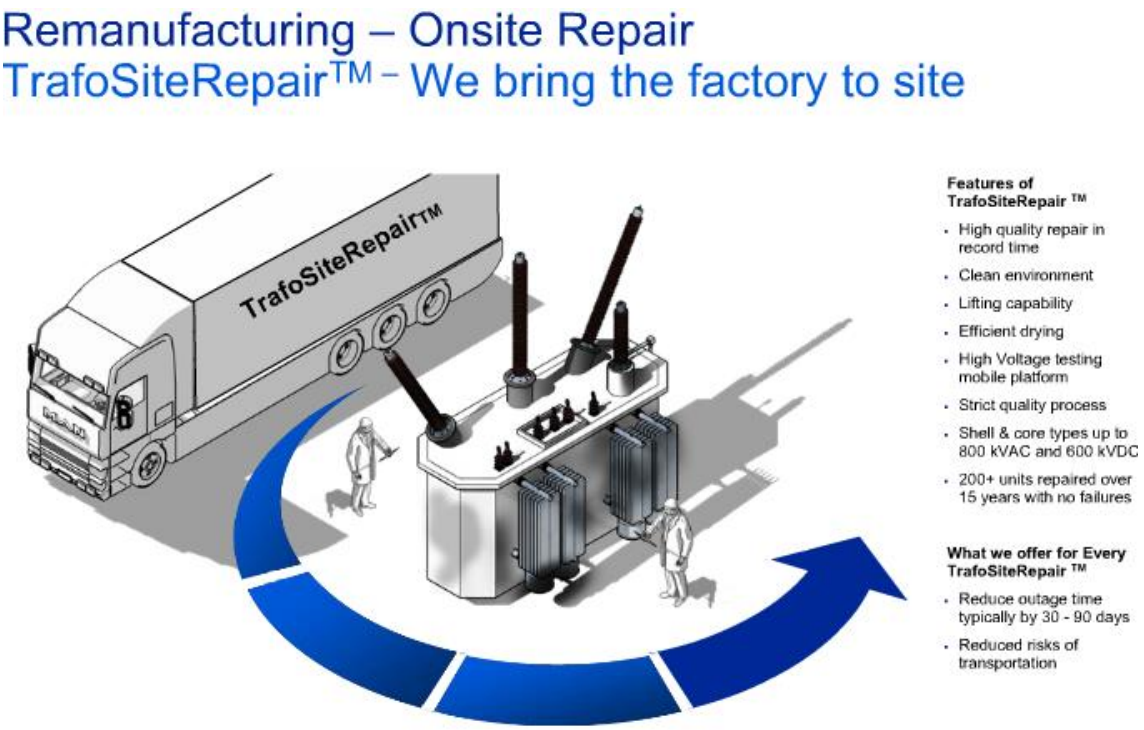

Figure 14. Transformer site repair solution (TrafoAssetManagement Webinar – ABB Group)

With ambitious view, ABB Vietnam and service manager can apply site repair solution as illustrated in above figure which need large investment from the beginning but will bring out many opportunities and regain the profit by providing advanced service that not many competitors in the region can offer. With the ability of remanufacturing transformer at site, customer will save a lot of transportation cost and it can be transferred into service's revenue and profit by higher service price.

- **Optimize customer service process**

Optimize scheduling seems to be the hard part of service process improvement as the service request naturally come from customer and most of them are unpredictable and many of them are urgent requests. Service team cannot let the transformer remain shut down while the whole production line or industrial zone need electric power, but they also cannot let their service engineer being idle for long time just to wait to serve specific customers. Therefore, service manager need to make priority chart based on the important and urgency of each transformer supplied, service engineer should be assigned for most critical hot fix service and doing service for close by customers to shorten their travel time. For example, before service engineer come to the site in Africa, service handling staff at the office need to check with other departments to find out if any internal service request might be appeared at that area, in some cases, there are installation or supervision request waiting to be forwarded to service team. Another way to improve scheduling service is to get the most accurate installation date as possible from customer. Frequent contact with customer to get their fixed date of installation required will help service manager to plan better in assigning the job.

Handling service request when traveling (going mobile) is another way to improve responding time, hence improve profit for the team. In some cases, the author has difficulties in getting support from specific service engineer (for technical advice or site procedure revising) because he is travelling to the site without available connection. To enable support from site service staffs when they are not in the office, company provided tele-communication devices (such as phone with global sim card or roaming ability, laptop and 3G USB for internet connection, et cetera) should be utilized.

Service department always need back office supports to handle customer request, while at the factory, some employees are not aware of the important in supporting service team to shorten respond time to customer call. Therefore, management should be involved and more training should be carried out to ensure the whole organization have customer-centric attitude. There was an interesting experience that the author had when accompanied customer for transformer packing inspection, after the inspection finished, inspector said thank you to packing staff who did the hard work and received the response from the staff “As long as you keep buying our product, I will be happy doing my job in supporting you”. Both inspector and the author were impressed and very satisfied with that attitude. If other employees have the same working approach, customer service team will have much easier time serving customer.

- **Improve service selling**

Currently, transformer service team of ABB Vietnam has one senior service sales personnel responsible for selling service for local market only, foreign markets service

sales (which account for 50% of product sales but 70% of service sales) were handled by account managers of Sale & Marketing department. As analyzed in previous part of this study, this structure might be not ideal for selling service. Dedicated sales persons with enough experience and knowledge in service selling should be assigned and solely responsible for selling transformer service package.

Company also need to pay more attention on marketing service package, not only focusing on advertising products. More training in service marketing should be made to service engineer, service handling staff and other staff having contact with customer. Whenever you have a call or meeting with customer, there is a chance to market your service, company can make service one of its' main profit driving force by nurturing service focus attitude among all employees.

- **Turn attention to customer's process**

This is a more advanced module in the journey of growing profitable in transformer service, hence it will needs more advanced technology and approach. Fortunately, ABB is a global group with strong focus on providing advanced service to customer. Therefore, ABB Vietnam can utilized the development of the Group in this field.

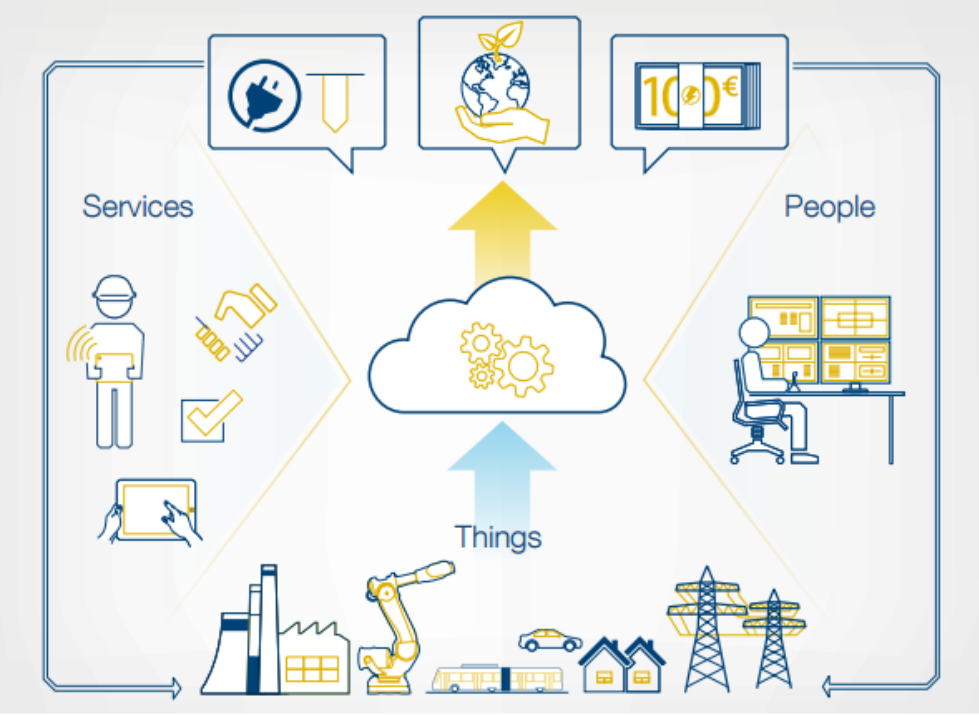

Figure 15. The Internet of Things, Service and People (ABB Group website)

In order to pay attention to customer's process, service team need to collect information at site and the most convenience way is using sensor that provide valuable information about transformer's health and status. By the available of the Internet of Things, Service

and People technology within ABB Group which is presented on above figure, transformer product now can be installed with sensor to enable online monitoring capability. The smart solution called Transformer Intelligence™ was introduced by ABB Group on March 2015, including online monitoring system CoreTec™ (which keeps a close watch on a transformer's mission-critical functions and performs a complete evaluation of its operating conditions) and CoreSense™ sensor (which continuously records hydrogen and moisture and provides CoreTec™ with real-time data to optimize transformer management). By using these sensors and technology, another advanced service developed by ABB Group that can be applied by ABB Vietnam in transformer factory is the TrafoAssetManagement™ proactive service which include Remote Control Center solution. Customer's control and monitoring responsibility can be transferred to ABB Vietnam with lower cost and more professional care.

5. CONCLUSIONS

5.1 Contributions

This research offer several contributions to the reader and the case company's managers. Firstly, different definitions of service, customer services, after-sales service and servitization were discussed and summarized. Those definitions make the foundation to the study and help the readers understand key components of industrial customer service. In addition, the introducing of different customer service strategies guides the reader through several frameworks which can be applied into various business models.

The second contribution of this thesis is the study about servitization process in industrial company. This well-known transformation was mentioned in a lot of research and academic paper which are summarized and analyzed in chapter 2. The process itself creates quite many confusing and hesitating among the companies those want to follow it, due to the uncertainty and challenging obstacles it offers. By reviewing the possible benefits and draw backs of servitization, it is to be concluded that firms should follow the trend to transform to service business if they do not want to be left behind and losing their customer. But for sure the challenges need to be addressed and study carefully to avoid negative impacts as much as possible.

The most important contribution of this paper is to find the answer for two main research questions including:

- How manufacturing companies can manage their service network efficiently?
- How industrial organizations can utilize the potential profitability of service business?

Different literature sources were reviewed and studied to develop overall framework and detailed suggestion to the case company to help company's managers gradually find their way to improving their service business.

5.2 Implications

The study concentrated on the customer service of industrial firms with the case company is Hanoi transformer factory of ABB Vietnam. The main objectives of the paper are to review servitization process in manufacturing environment, study key factors and

solutions to improve customer service efficiency and profitability of manufacturer in general and the case company specifically.

The existing literature consists of general customer service definitions, the benefit and challenges of servitization and different frameworks to improve efficiency and profitability both in industrial service and "pure-service" sector. Based on these research and frameworks as well as the observation and research results from the case company, two frameworks was developed and summarized in below compact figure.

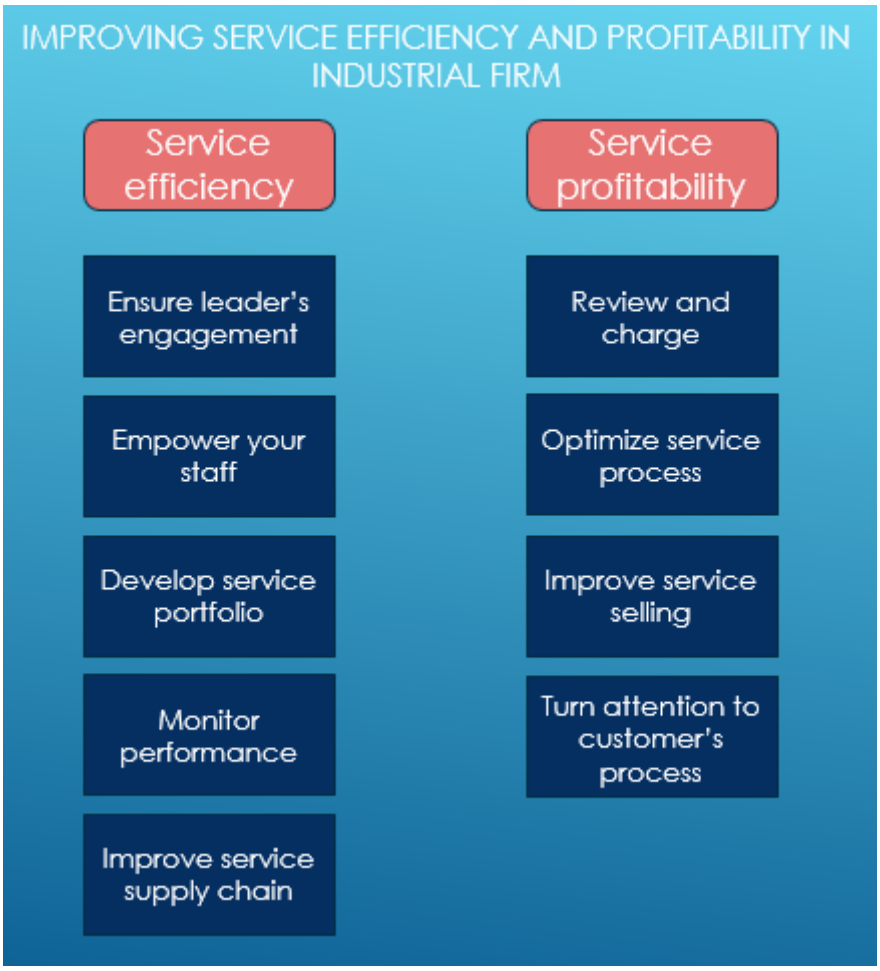

Figure 16. Improving service efficiency and profitability in industrial firm

The left column of the compact framework above suggests five steps to efficiently develop company service from three perspectives including management, human resource and process. The right hand column presents another four steps to utilize the promising profitability of customer service in industrial world with focus on reviewing current business, optimizing process, improving sales and reaching further to customer's in-house process. These steps might be similar to many managers and firms but to go in detail and really apply those into operation will need the commitment from the whole

organization. Even though it needs a lot of time and effort not to mentioned capital investment, the results and achievements will definitely worth it.

5.3 Future research

The frameworks even though were developed from literature sources in both industrial service sector and "pure-service" sector but it is in light of the case company which is a global leader in manufacturing world with long history of service development and optimization. Therefore, in order to apply the framework into different context, it will need further modifications to well suit the actual case it serve.

The outcomes of the study are quite detail suggestions but they are limited to the qualitative aspects, company manager can based on the frameworks to make their plan and decide strategic improvement. However, in order to actually apply the development into real situation, further quantitative study will need to be made. Since the numbers will tell many stories that can significantly affect the decision making process.

REFERENCES

ABB Group's website, http://www.abb.com/ (accessed various times from 10/03/2016 to 02/05/2016)

Agnihothri, S., Sivasubramanian, N. and Simmons, D., (2002), "Leveraging technology to improve field service", *International Journal of Service Industry Management*, Vol. 13 No. 1, pp. 47-68.

Alexander, W. L., Dayal, S., Dempsey, J. J., & Ark, J. V. (2002), The secret life of factory service centers. *McKinsey Quarterly*, 37(3), 106-115.

Baines, T., Lightfoot, H., Benedettini, O. and Kay, J., (2009). The servitization of manufacturing: A literature review and reflection on future challenges. *Journal of Manufacturing Technology Management*, 20(5), pp. 547-567

Cohen, M., Agrawal, N. and Agrawal, V., (2006), Winning in the aftermarket, *Havard Business Review*, May.

Davey, K., Kon, M., & Westru,p J. (2008), *In a Downturn, Protect Pricing without Alienating Customers*, Oliver Wyman.

Davies, A., Brady, T., & Hobday, M. (2007), Organizing for solutions: systems seller versus systems integrator, *Industrial Marketing Management*, Vol: 36, pages: 183 - 193.

Dougherty, D. & Murthy, A. (2009), What service customers really want. *Harvard Business Review*. September.

Fife, B., (2013), *A Framework for Advancing a Culture of Customer Service in Health and Human Services*, Customer Service and Culture Change Best Practices Project, Child and Family Policy Institute of California.

Gaiardelli, P., Saccani, N. and Songini, L. (2007), "Performance measurement systems in after-sales service: an integrated framework", *International Journal of Business Performance Management*, Vol. 9 No. 2, pp. 145-71.

Gebauer, H., Gustafsson, A., and Witell, L., Competitive advantage through service differentiation by manufacturing companies, (2011), *Journal of Business Research*, (64), 12, 1270-1280.

Goffin, K., (1999), "Customer support: A cross-industry study of distribution channels and strategies", *International Journal of Physical Distribution & Logistics Management*, vol. 29, no. 6, pp. 374.

Goffin, K. and New, C. (2001), "Customer support and new product development", *International Journal of Operations & Production Management*, Vol. 21 No. 3, pp. 275-301.

Gronroos, C., (2008), *Service Management and Marketing: A Customer Relationship Management Approach*, John Wiley & Sons, Ltd., England.

Gummeson, E. (1993), *Case Study Research in Management: Methods for Generating Qualitative Data*, Stockholm University.

Heskett, J.L., Sasser, W.E. and Schlesinger, L.A. (1997), *The Service Profit Chain*, Free Press, New York, NY.

Kotler, P., (1997), *Management Marketing*, New Jersey, United States of America.

Kumar, R., Markeset, T. & Kumar, U., (2004), "Maintenance of machinery: Negotiating service contracts in business-to-business marketing", *International Journal of Service Industry Management*, vol. 15, no. 3, pp. 400.

Lele, M. (1986), "How service needs influence product strategy", *Sloan Management Review*, Vol.28.

Lele, M. and Karmarka, U. (1983), Good product support is smart marketing, *Havard Business Review*, Nov.

Lovelock, C. (1991), *Services Marketing*, Prentice-Hall, Englewood Cliffs, NJ.

Markeset, T. and Kumar, U. (2003) Design and development of product support and maintenance concepts for industrial systems, *Journal of Quality in Maintenance Engineering*, Volume 9, Number 4, pp 376-392.

Marks, F., Ramselaar, L., Mulder, J., Muller, H., Langkamp, S. and Boymans, C. (2011), *Servitization in Product Companies – Creating Business Value Beyond Products*.

Martin, M. (2003), *Business Efficiency For Dummies*, John Wiley & Sons.

Mathe, H., & Shapiro, R.D. (1993). *Service and Strategic Direction*, Cergy: CER-ESSEC.

Mathieu, V. (2001). Product services: From a service supporting the product to a service supporting the client. *The Journal of Business and Industrial Marketing*, 16 (1), 39–61.

Martinez, V., Bastl, M., Kingston, J., & Evans, S. (2010). Challenges in transforming manufacturing organisations into product-service providers. *Journal of Manufacturing Technology Management*, 21(4), 449-469

Miller, D., (1987), The structural and environmental correlates of business strategy, *Strategic Management Journal*, January/February, pp. 55-76.

Neely, A. (2009) *The Servitization of Manufacturing: An Analysis of Global Trends*. University of Cambridge.

Neely, A., Benedetinni, O., and Visnjic, I., (2011) The servitization of manufacturing: Further evidence, *18th European Operations Management Association Conference*, Cambridge.

Oliva, R. & Kallenberg, R., (2003), "Managing the transition from products to services", *International Journal of Service Industry Management*, vol. 14, no. 2, pp. 160-172.

Oxford Dictionary, http://www.oxforddictionaries.com/ (accessed 15/04/2016)

Quinn, M. & Humble, J. (1993). Using service to gain a competitive edge – the prompt approach. *Long Range Planning*, 26(2), 31-40.

Quinn , R. E., Faerman, S., Thomson, M., & McGrath, M. (1990). *Becoming a Master Manager: A Competitive Value Approach*. New York: John Wiley & Sons.

Reinartz, W. & Ulaga, W., (2008), How to sell services more profitably, *Havard Business Review*, May.

Ren, G., & Gregory, M. (2007), Servitization in Manufacturing Companies, *Cranfield Product-Service Systems Seminar*. Cranfield University.

Rigopoulou, I.D., Chaniotakis, I.E., Lymperopoulos, C. and Siomkos, G.I., (2008), After-sales service quality as an antecedent of customer satisfaction – The case of electronic appliances. *Managing Service Quality* Vol. 18 No. 5, pp. 512-527

Saccani, N., Johansson, P., & Perona, M. (2007). Configuring the after-sales service supply chain: A multiple case study. *International Journal of Production Economics*, 110(1-2), 52-69

Schmenner, R.W., (1995), *Service Operations Management*, Prentice Hall, Inc., Englewood Cliffs, New Jersey.

Schreter, S., (2008), *3 Simple Steps to Improve Profitability*. https://www.entrepreneur.com/article/192140 (accessed 02/05/2016)

ServiceMax white paper (2015), *5 Key Steps to Make Field Service Profitable.* http://www.servicemax.com/ (accessed 15/04/2016)

Slepniov, D., Waehrens, B., & Johansen J. (2010), Servitization as a strategy for survival: an investigation of the process in Danish manufacturing firms, *Paper for the 15th Cambridge International Manufacturing Symposium*, 23 - 24 September, Cambridge, UK.

Teboul, J., (2006). *Service is Front Stage – Positioning Services for Value Advantage*. Palgrave Macmillan. Pp 7-14.

Thompson, H. (2000). *The Customer-centered Enterprise. How IBM and Other World-class Companies Achieve Extraordinary Results by Putting Customer First*. MrGraw-Hill.

Vandermerwe, S. and Rada, J. (1988), "Servitization of business: Adding value by adding services", *European Management Journal*, Vol. 6 No. 4, pp. 314-324.

Vargo, S. & Lusch, R., (2004), Evolving to a New Dominant Logic for Marketing, *Journal of Marketing*, Vol. 68, January, pp. 1–17.

Vitasek, K. (2005), *Supply Chain & Logistics Terms and Glossary*, Supply Chain Vision, Belevue, *WA.*

Wise, R., and Baumgartner, P., (1999). Go Downstream: the New Profit Imperative in Manufacturing. *Harvard Business Review*: pp. 133-141.

Wouters, J. P. M., (2004), Customer service strategy options: A multiple case study in a B2B setting, *Industrial Marketing Management*, vol. 33, no. 7, pp. 583-592

APPENDIX 1: CUSTOMER SURVEY FORM

CUSTOMER SURVEY
PHIẾU THĂM DÒ Ý KIẾN KHÁCH HÀNG

To the esteemed CUSTOMER : First of all, we, ABB Ltd., would like to sincerely thank the esteemed customer for your trust in our transformer product and service. To help us improve our transformer product and service quality, you are kindly requested to spend a little of your valuable time to share your thinking and opinion in the below questionnaire.
With your sincere feedback, we will improve our product and service quality to serve you better.
(Please click into the suitable number)

Kính gửi: **QUÝ KHÁCH HÀNG**
Trước hết, công ty TNHH ABB xin chân thành cảm ơn quý khách hàng đã tin tưởng sử dụng sản phẩn và dịch vụ MBA của công ty chúng tôi. Nhằm mục tiêu nâng cao chất lượng sản phẩm và dịch vụ của công ty, chúng tôi kính đề nghị quý khách hàng dành chút thời gian quý báu cho ý kiến vào bảng điều tra dưới đây.
Từ những nhận xét chân tình của quý vị, chúng tôi sẽ cải tiến nâng cao hơn nữa chất lượng sản phẩm và dịch vụ để phục vụ quý khách ngày một tốt hơn.
(Đề nghị quý khách hàng đánh dấu vào ô lựa chọn)

Customer information:

Company name & address (Tên và địa chỉ doanh nghiệp) .....

Business Area (lĩnh vực hoạt động của doanh nghiệp) Power-Utility(Điện lực/Năng lượng) ☐ Industry (Công nghiệp ☐ EPC-Consultant (Tổng thầu/Tư vấn) ☐ Construction-Service (Xây lắp/Dịch vụ) ☐ Other (Ngành khác) ☐

1. ABB Vietnam Transformer Product / Sản phẩm MBA

	1-Very good (rất tốt)	2- Good (tốt)	3- Normal (trung bình)	4- Bad (kém)
1.Brand reliability (Độ tin cậy của thương hiệu)	☐	☐	☐	☐
2.ABB design (Thiết kế)	☐	☐	☐	☐
3.Product quality – stability, durability,… (Chất lượng sản phẩm – độ ổn định, độ bền…)	☐	☐	☐	☐
4.Product performance – loss, outage time,…(Hiệu quả hoạt động – tổn thất, thời gian ngừng hoạt động,…)	☐	☐	☐	☐
5.Sufficiency of the transformer documents (Tài liệu MBA)	☐	☐	☐	☐
6.Minimize environmental impact – loss, noise, oil leaking,… (Giảm thiểu tác động môi trường – tổn hao, tiếng ồn, dò rỉ dầu,…)	☐	☐	☐	☐

2. ABB Vietnam Transformer Sales&Price / Bán hàng & giá cả

	1-Very good (rất tốt)	2- Good (tốt)	3- Normal (trung bình)	4- Bad (kém)
1.Respond time of the inquiries (Thời gian trả lời đơn hàng)	☐	☐	☐	☐
2.Clarity of the quotation – Term&condition, specs, scope,… (Báo giá rõ rang – Điều khoản, đặc điểm MBA,…)	☐	☐	☐	☐
3.Technical knowledge and qualification of the sales person (Độ am hiểu sản phẩm của nhân viên bán hàng)	☐	☐	☐	☐
4.Communication ability of the sales person (Khả năng giao tiếp của nhân viên bán hàng)	☐	☐	☐	☐
5. Price (Giá cả)	☐	☐	☐	☐

3. ABBVN Transformer Service & Technical support / Hỗ trợ kỹ thuật

	1-Very good (rất tốt)	2- Good (tốt)	3- Normal (trung bình)	4- Bad (kém)
1. Tele-consulting (Tư vấn từ xa)	☐	☐	☐	☐
2. Communication ability of service person (Khả năng giao tiếp của nhân viên dịch vụ)	☐	☐	☐	☐
3. Technical knowledge of the service engineer (Trình độ kĩ thuật của kĩ sư dịch vụ)	☐	☐	☐	☐
4. Respond time of Breakdown/Maintenance/Repairing Inquiry (Thời gian đáp ứng yêu cầu chữa, bảo dưỡng)	☐	☐	☐	☐
5. Quality of field service (Chất lượng dịch vụ tại hiện trường)	☐	☐	☐	☐
6.Ensuring spare part (Thiết bị thay thế)	☐	☐	☐	☐

4. Delivery / Giao hàng

	1-Very good (rất tốt)	2- Good (tốt)	3- Normal (trung bình)	4- Bad (kém)
1.Lead time (Thời gian hoàn thành đơn hàng)	☐	☐	☐	☐
2.On time delivery (Giao hàng đúng hạn)	☐	☐	☐	☐
3.Packaging (Đóng gói)	☐	☐	☐	☐
4.Delivery term (Điều khoản giao hàng)	☐	☐	☐	☐

5. Customer comments and suggestions / Bình luận và gợi ý của khách hàng

Customer comments and suggestions (Bình luận và gợi ý của khách hàng)

……

……

……

If you used transformers from other suppliers, could you please compare ABB transformers with other suppliers' in term of product, services, price,…
(Nếu quý khách đã sử dụng MBA của các hãng khác, vui long so sánh MBA của ABB và các hãng khác trên phương diện sản phẩm, dịch vụ, giá cả…)

……

……

……

Yours truly/Trân trọng.

Date/Ngày:

Name/Signature/Position(Tên/chữ ký/vị trí công tác):