



APPLICATION OF SIX SIGMA AND SUPPLY CHAIN STRATEGIES TOWARD E-TRANSFORMATION IN THE COMMERCIAL BANKING INDUSTRY OF SRI LANKA

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ABSTRACT

This research aimed to investigate the application of the concepts of Six Sigma and Supply Chain Strategies toward E-Transformation in the Commercial Banking industry of Sri Lanka. Two pioneered Public Sector Banks and Two Private Sector Banks have been selected by using the purposive sampling method in order to increase the validity of the research. An Interpretive Case Study method has been followed and through the in-depth interview, the applications were understood. Findings show, though the concepts of Six Sigma and Supply Chain Strategies are unique and more relevant to manufacturing organizations, they could be practiced to service organizations as well. Further, the application of these two concepts by the Sri Lankan Banking Industry is remarkably observed and comparatively higher in the Private Banking Sector. It is also found that their applications contribute to the successful E-Transformation which leads to gain competitive advantage by the banks in the Industry.

Key Words: Banking Industry of Sri Lanka, Competitive Advantage, E-Transformation, Six Sigma, Supply Chain Strategies.

1. INTRODUCTION

Six Sigma, Supply Chain Management and E-Transformation are three unique phenomena and their impacts on organizations are inevitable. Six Sigma is a business management strategy originally developed by Motorola, USA in 1981[17]. It was originated as a set of practices designed to improve manufacturing processes and eliminate defects, but its application was subsequently extended to other type of business processes as well. The Six Sigma comes from a field of statistics known process capability studies [13]. The six Sigma approach to managing is all about what you don't know as well as emphasizing what you should know, and taking action to reduce the errors and rework that cost you time, money, opportunities and customers. Six Sigma translates that knowledge into opportunities for business growth.

Supply Chain is a sequence of processes and flows that take place within and between different stages

and combined to fill a customer need for a product. The cycle view of supply chain illustrates where the processes in a Supply Chain are divided into a series of cycles each performed at the interface between two successive stages of a supply chain. On the other hand, the processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order (pull) or in anticipation of customer order (push) whereas push processes are initiated and performed in anticipation of customer orders[4].

The third phenomenon is the E-Transformation. E-Transformation is a planned and evolutionary move towards leveraging web technologies to enhance business. In addition to implementing the technologies, this move is characterized by the need to evaluate processes within the organization and manage relationships [1].



2. REVIEW OF LITERATURE

2.1 Six Sigma

Six Sigma is a statistical concept that measures a process in terms of defects. Achieving Six Sigma means your processes are delivering only 3.4 defects per million opportunities. In other words they are working nearly perfectly. The symbol for sigma represents the standard deviation in statistics. In its business use, it indicates defects in the outputs of a process and helps to understand how far the process deviates from perfection [3]

Six Sigma doctrine asserts that:

- Continuous efforts to achieve stable and predictable process results which are of vital importance to business success.
- Business processes have characteristics that can be measured, analyzed, improved and controlled.
- Achieving sustained quality improvement requires commitment from the entire organization particularly from top level management.

Key Players in Six Sigma

- Executive Leaders- to commit to Six Sigma and to promote it throughout the organization.
- Champions- to fight for the cause of black belts and remove barriers.
- Master Black belts- to serve as trainer, mentor and guide.
- Black belts- to work full time on projects.
- Green belts- to assist black belts part time [10]

Features of Six Sigma not only emphasize the quality improvement initiatives but also include the followings.

- A clear focus on achieving measurable and quantifiable financial returns from any six sigma project [10].
- An increased emphasis on strong and passionate management leadership and support [10].
- A special infrastructure of Champions, Master black belts, Black belts, Green belts

etc. to lead and implement the Six Sigma approach [10].

- A clear commitment to making decisions on the basis of verifiable data rather than assumptions [10].

Six Sigma allows you to achieve the constancy of purpose that is the secret to success, by focusing your efforts on understanding the variations in your processes and the defects that result. They are money, customer satisfaction, and quality, impact of employees, growth and competitive advantage [3].

Six Sigma projects follow two project methodologies such as DMAIC (Define, Measure, Analyze, Improve and Control) and DMADV (Define, Measure, Analyze, Design and Verify) [3]

The first methodology has been considered as more viable in this study. They are elaborated below.

- Define the projects, the goals and the deliverables to customers (internal and external).
- Measure the current performance of the process.
- Analyze the data to investigate and verify cause- and- effect relationship.
- Improve the process to eliminate defects.
- Control the performance of the process.

The success of Six Sigma relies on the people who are responsible for implementing it. According to the statement of the Vice President of Motorola, Six Sigma is not a product you can buy, it is a commitment.

Therefore, from the above literature, researcher believes that the Six Sigma concept is relevant to E-Transformation in organizations.

2.2 Supply Chain Strategies

The study highlighted those leading companies that focused on building and rebuilding supply chains to deliver goods and services to consumers as quickly and inexpensively as possible. Those firms invested in state of the art technologies and when that proved to be inadequate they hired top notch talent to boost supply chain performance. Many companies also teamed up to streamline processes, lay down



technical standards and invest in infrastructure they could share [12]. He further suggested that top performance supply chains possess three very different qualities: Agile, Adaptability and Alignment. Great supply chains are agile. They react speedily to sudden changes in demand or supply. In adaptability, they adapt over time as market structures and strategies evolve. Finally in alignment, they align the interest of all the firms in the supply network, so the companies optimize the chain's performance when they maximize their interests. He argues that only supply chains those are agile, adaptable and aligned provide companies with sustainable competitive advantage.

Most of the organizations prefer the idea that supply chains should be agile. Adaptability and alignment are more novel concepts than agility is. However, even if your supply chain is adaptable and aligned, it is dangerous to disregard agility.

Another finding shows that companies often looked out for their own interests and ignored those of their networked partners [14].

Another researcher distinguishes between two supply chain types. Physically efficient and market responsive, each having a certain set of characteristics [7]. The path model emphasizes the importance of knowledge sharing and orchestrating the supply chain at the very beginning of the relationship [5,11].

Supply Chain is a cross functional enterprise system, which uses information technology to help support and manage the link between some of a company's key business processes and those of its suppliers, customers and business partners. The goal of supply chain management is to create a fast, efficient and low cost network of business relationship on supply chains [15]. A successful supply chain strategy is based on accurate order processing, just- in- time inventory management and timely order fulfillment. The e-commerce opportunity lies in the fusing of each company's internal systems to those of its suppliers, partners and customers. This fusion forces the companies to improve manufacturing efficiency and distribution effectiveness. Many of the companies are turning to internet technologies to web enable their supply chain processes, decision making and information flows.

There are three macro processes in a firm classified as Customer Relationship Management (CRM) where all processes that focus on the interface between the firm and its customers. Secondly, the internal supply chain management (ISCM) where all processes are internal to the firm and finally the Supplier Relationship Management (SRM) where all processes that focus on the interface between the firm and its suppliers.

A company's competitive strategy defines relative to its competitors the set of customer needs that it seeks to satisfy through its products and services. A product development strategy specified the portfolio of new product that a company will try to develop. It also dictates whether the development effort will be made internally or outsourced. A marketing and sales strategy specifies how the market will be segmented, products will be positioned, priced and promoted and how a supply chain strategy determines the nature of procurement of raw materials, transportation of materials to and from the company, manufacture of the product or operation to provide the service and distribution of the products to the customers along with any follow up services and a specification of whether these processes will be performed in house or outsourced.

Supply chain strategy includes a specification of broad structure of the supply chain and what may traditionally call supplier strategy, operational strategy and logistics strategy. An organization's supply chain strategy and competitive strategy must fit together and have aligned goals. It refers to consistency between the customer priorities that the competitive strategy hopes to satisfy and the supply chain strategy aims to build. The issue of achieving strategic fit is a key consideration during the supply chain strategy. If a mismatch exists between what the supply chain does particularly well and the desired customer needs, the company will either need to restructure the supply chain to support the competitive strategy or alter its competitive strategy [6].

2.3 E-Transformation

The E-Transformation is a concept which was emerged in past decade. It is an Organizational Transformation (OT) which is highly involved with the Information and Communication Technology. The OT can alternatively be used in various



organizations by different terms by different people such as Business Process Reengineering, Business Process Redesign, Business Reconfiguration, Business Transformation, or Business Process Change Management and Organizational Change.

Business processes have been changing continuously due to business driven and IT driven forces. Business driven forces are market pressures, customer needs and competition. IT driven forces result from advances and merging of Information and Communication systems. Exchange of information in a company has changed dramatically with the introduction of facsimile, email, intranets and the internet. The process of transforming into an innovative and effective IT – enabled organization is E-Transformation [2].

Ginige further claimed that E-Transformation is an ongoing process with multiple stages and dimensions and cannot be approached as a one off project. In its early stages, business reasons heavily influence the types of information systems deployed in the organization [8].

E-Transformation means an Organizational Transformation which uses the ICT as a catalyst. There are various definitions for e-Transformation. “E-Transformation is about the effective diffusion and use of ICT and about the deep structural capability changes in the economy and society that accompany ICT use and diffusion” [9] and comprises several key interdependent elements.

The doctoral study of the researcher found that there are internal and external factors (PEST) impacts on the readiness of technology adoption and its success on the organizations and they play a key role in E-Transformation achievement in the banking industry [16].

Though the concept of six sigma is related with manufacturing, and the supply chain strategies are also giving emphasis to product marketing, the researcher tries to investigate the impacts of them towards E-transformation in service marketing organizations- the banks.

3. RESEARCH METHODS

Since this research study is a multi-disciplined and pays more attention on theoretical and qualitative

aspects, the researcher has chosen an Interpretive Case Study method. Moreover, two pioneered banks in the public sector and two from private sector in Sri Lanka have been considered in this research based on the purposive sampling method to increase the validity of the research. Further, through the in depth interview methods, the application of concepts in each bank have been identified.

Further, various literature have been included regarding the concepts and their impacts towards E-Transformation. This would enable the practitioners and the potential researchers to get a clear understanding about them.

4. ORGANIZATIONAL IMPLICATIONS ON CONCEPTS

4.1 Application of Six Sigma in the Banking Industry

The first doctrine of six sigma asserts the continuous efforts to achieve stable and predictable process results which are of vital importance to business success. In case of banking industry, banks face the challenge of optimizing the productivity of employees while retaining superior expertise to drive strategic efforts. Therefore, they try to adopt new technological innovations since they are in the competitive market. One of the public sector banks in the sample has been the first mover in the industry in computerization. However, the other followers have overtaken this bank in other operational aspects.

The second doctrine, business processes that can be measured, analyzed, improved and controlled are well practiced in both the public and private sector banks as they are in a tight competitive industry.

Finally, achieving sustained quality improvement requires commitment from the entire organization particularly from top level management. In case of the banking industry, commitment of staff in various levels has been studied. They are Strategic level, Tactical level, Operational level, Knowledge workers and End users. Commitment and support from all levels are inevitable. Therefore, the application of the third doctrine of six sigma is also relevant to the banking industry of Sri Lanka.

It is investigated even though the six sigma is applicable to the manufacturing organizations; it is



also practicable to the service organizations. The relationship between the Six Sigma and the E-Transformation will be discussed under section 4.3.

4.2 Application of Supply Chain Strategies in the Banking Industry

A company's competitive strategies of product development strategy, marketing and sales strategy and the supply chain strategies are well practiced in the banking industry of Sri Lanka. Similarly, the supply chain strategies such as supplier strategy, operational strategy and logistics strategy are also practiced by banks in different levels. However, the application of supplier strategy is less in the banking industry of Sri Lanka rather than the other two Supply chain strategies since the banks are the service providing organizations.

Effectively managing the vendor relationships and external partnering are greater in extent in the banking industry. There are various national and International vendors who deliver hardware and software for the banking operations and systems.

In the banking industry of Sri Lanka, both the public and private banks try to achieve the strategic fit by matching the competitive and supply chain strategies. Usually the restructuring process or transformation is possible among the banks when there is no consistency between these two strategies.

Further, the three macro processes in the supply chain such as CRM, ISCM and the SRM have been efficiently practiced by banks particularly among private sector banks in Sri Lanka.

4.3 Six Sigma and E-Transformation

The first methodology of six sigma - DMAIC has been followed in this study. In order to define the projects, the goals and the deliverables to customers (internal and external), all banks in the banking industry of Sri Lanka have followed a proper system to disclose their vision, mission, goals and objectives in their corporate plan. Further, the internal customers are the employees who work hard to achieve a high customer satisfaction level at their banks. Banks continuously arrange training programs to employees to deliver customized services and maintain a good CRM practices.

Regarding the E-Transformation journey, as stated earlier, all the five categories of staff's involvement and support are necessary to achieve higher level in E-Transformation.

Secondly, measure the current performance of the process is very much important to have good six sigma practices. This is important to a successful E-Transformation because transformation is not an event and it's a process. Without understanding the existing management and systems processes, it's difficult to organizations to transform its business processes successfully.

Next, to analyze the data to investigate and verify cause- and- effect relationship is a key aspect in Six sigma. Similarly, this step is very useful for E-Transformation as well. In the, systems development process and to change the existing processes, banks must be aware of the cause- effect relationship. Otherwise the E-transformation Journey may face the obstruction for further development.

Improve the process to eliminate defects is the next step in DMAIC. In this aspect, defects in banks are the malpractices and delayed services delivered to its customers. These will lead them to reduce their customers' satisfaction and loyalty. Therefore, in order to improve them, the E-Transformation is important.

Finally, Control the performance of the process is necessary to monitor whether the organization is going on the right path. The success of Six Sigma relies on the people who are responsible to implement it. Similarly in the E-transformation also the participants in the E-transformation journey will decide the success of the level of achievement in e-transformation.

As stated earlier in the six sigma literature, Executive Leaders, Champions, Master Black belts, Black belts and Green belts are the key players. In the E-Transformation journey, executive leaders play champions role as well and the other players are called in different names and in different levels of management in the banking industry of Sri Lanka.

4.4 Supply Chain Strategies and E-Transformation



The literature highlighted that the supply chain strategies Agile, Adaptability and Alignment are the foundation strategies to an organization to be successful. In case of banking industry, the **Agility** which responds to short term changes in demand or supply quickly and handles external disruptions smoothly has been properly handled by the public as well as private banks in the industry. Since these are the financial service providing institutions. Usually they promote information with customer and suppliers. Here, customers are the public who get services from the banks and the suppliers are the Central bank, creditors and other vendors who provide hardware, software and other technical infrastructure within and outside the banks. Further, private sector banks have the collaboration with the public sector banks to gain collaborative advantage to reduce the competition in the industry and attracting their customers as well. This strategy enables the banks to sustain competitive advantage through information technology and E-Transformation among banks.

The second strategy **Adaptability** is to adjust supply chain decisions to meet structural shifts in the markets, modify supply network to strategies, products and technologies. This is the most appropriate strategy of the Sri Lankan banks which lead them for a successful e-transformation. They are having their branches in abroad based on the global financial conditions and the expectations of the customers in relevant countries. There are customer-focused services delivered by both the public and private sector banks in Sri Lanka for their loyal customers. Through this, banks are able to provide flexible and convenient services to their customers. Interbank networking, electronic fund transfer, home banking and mobile banking and the 24 hours of the uninterrupted ATM services and flexible banking hours are some of their prominent services to customers.

Further, in case of e-transformation, the usage of information and communication technology has been gradually increased in their customer services and internal operations. Banks try to improve their services based on the position which the services hold and their position in the industry.

Finally the **Alignment** strategy of supply chain emphasizes the exchange of information freely with vendors and customers; lay down the roles, tasks and

responsibilities clearly for customers and vendors and equitably sharing risks, costs and gains of improvement initiatives among the stakeholders. This strategy is also applicable for the Sri Lankan Banks.

Moreover, competitive strategies of product development strategy, marketing and sales strategy and the supply chain strategies are well practiced in the banking industry of Sri Lanka towards the E-Transformation. New products are being developed based on the market trend; marketing and sales strategies are being practiced among them based on the customers' needs and the supply chain strategies are being practiced by them to maintain a good vendor relationship.

Therefore, it is apparent that the supply chain strategies lead the banks toward E-Transformation and the application level by each bank is different.

5. FINDINGS AND DISCUSSION

In this research study the researcher found that there is a relationship between the Six sigma, supply chain strategies and E-Transformation in the banking industry of Sri Lanka. The researcher attempted to investigate the application of these two concepts which are usually followed by manufacturing organizations in a service marketing industry. The findings show that six sigma is a concept not only applicable to manufacturing organizations to improve the quality and remove the defects but also for other service providing organizations as well to professionalize quality management practices and eliminate the errors in the operations. In case of the banking industry in Sri Lanka, the six sigma has been practiced in various ways. Regarding the application of DMAIC methodology of six sigma, define the problems, state the vision, mission, goals and objectives to relevant stakeholders have been properly carried out. Similarly, measure the key aspects, analyze the data, and improve the processes and the proper control actions have been taken by both the public and private sector banks in Sri Lanka.

In case of Supply chain strategies, agility, adaptability and alignment strategies have been practiced successfully in both public and private sector banks. However, since the customer base of the private sector banks is smaller than the public sector banks, they are able to do better than the public banks. However, the other competitive strategies are



being well practiced. Therefore, the strategic fit has been achieved among these banks.

Regarding the E-Transformation, the top management involvement, their leadership and participation in ICT/IS projects in the public sector banks, There is a separate Division called Business Process Re-engineering in the pioneer public sector bank. All branches of this bank are being reorganized and repositioned to comply with the present day market requirement. The bank has developed a few modeling concepts suitable for each area after studying the customer behavior as well as their requirements. Further, findings from the interpretive case study analysis show that the adoption of ICT has increased the End Users' involvement and commitment in the Public sector banks. It has been revealed that the number of competitors in the industry will have an impact on public sector banks towards their e-transformation journey since the customers' expectations are in getting efficient and innovative services. , it was found that the large branch network of the Public sector banks is an inhibitor for the high level of achievement in E-Transformation in Public sector banks hence there is an obligation to these banks to treat their large multiple customer base.

On the other hand, in the qualitative case study analysis, the researcher has investigated the impact of internal and external factors which lead to a successful E-Transformation .The participation and involvement of Strategic Management, Tactical

Management, Operational Management, Knowledge Workers and End Users are towards the e-transformation in Private Sector Banks. Industry Competition, Market Coverage, External Infrastructure for ICT Adoption and the Level of ICT usage in the Industry are also the Critical Factors for the level of achievement in E-Transformation.

Therefore, the researcher believes that the six sigma and supply chain strategies have been practiced strategically in these banks and they enable the banks for successful E-transformation.

6 .CONCLUDING REMARKS

This research has investigated the relevance of the concepts of six sigma and supply chain strategies toward E-Transformation in the commercial banking industry of Sri Lanka. The findings show that these concepts have been well practiced in both the public and private sector banks. Further, the application of these concepts has a great impact on the level of achievement in e-transformation. However, based on the influence of internal and external factors, the achievement level in public sector banks and private sector banks is differed. Private sector banks have achieved higher level than the public sector banks since they have a smaller customer base than the Public sector banks.. Therefore, it is concluded that the relevance and application of six sigma and supply chain strategies are existing in the banking industry of Sri Lanka to gain competitive advantage and for a successfulE-Transformation.

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