



Arab American University

Faculty of Graduate Studies

Improving the Bank Account

Opening Process Using Lean Six Sigma

Methodology at Palestine Islamic Bank

By

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Supervised by Dr. Ashraf Al-Mimi

**This thesis was submitted in partial fulfillment
of the requirements for the Master's Degree
in Quality Management**

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I

Thesis Approval

**"Improving the Bank Account Opening Process using Lean Six Sigma
Methodology at Palestine Islamic Bank"**

By

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This thesis was defended successfully on 29-09-2018 and approved by:

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Declaration

I declare that I have developed and written this Master Thesis completely, and it has been generated by me as a result of my own original thesis, and has not been submitted elsewhere for any other degree or qualification. Moreover, I have not used sources or means without declaring them in the text, otherwise they are referenced.

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29/11/2018

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Abstract

Lean Six Sigma is a process improvement methodology focuses on the elimination of waste and variation to help organizations control the operations, increase the profit and reduce the cost. Its applications among Palestinian companies would contribute in improving processes, satisfying customers' desired needs and achieving better productivity with considerable financial results.

The purpose of this thesis is to improve the bank account opening process at the largest Islamic banking network in Palestine, using lean Six Sigma (LSS) Methodology. The time limit for an account opening process at Palestine Islamic Bank (PIB) has been significantly higher than that applied in other Palestinian Banks. The target is to save the time of opening a new bank account at least 20% which will result in fruitful outcomes like more satisfied customers, higher productivity, and attracting more customers to open deposit accounts. Accordingly, the management of PIB approved the review and analysis of the respective process of bank account opening to economize time, efforts and costs of service. This conduct was confirmed by the management of the Bank. In addition to working with key stakeholders at PIB, some of the LSS tools were used to gather data on the key measures for the account opening process. These measures include: the time from applying to open a new bank account to the actual time spent in opening of the account, and the customer's waiting time at the Bank before his/her bank account is created. Data collected on these measures were plotted on control charts which were monitored whenever improvements are made.

Following comprehensive understanding of the current performance of the account opening process, the root causes for a long time required to open a new bank account have been identified, such as many documents and information required from the customers, needless management's

approvals, and complicated processes among the bank units as well as there are no customized software programs for accounts opening. On the other hand, there are neither accurate nor direct tools for evaluating customer satisfaction with the procedures of account opening process and even the employees do lack skills for utilizing improvement tools and methodologies such as LSS.

In the improvement phase, the results showed that the implemented solution at Al-Bireh branch has reduced the average time of opening a new bank account from 38 minutes to 14.7 minutes i.e. by **61.4%**. This included reducing the customer's waiting time at the Bank through eliminating some steps which will be done in the back office after the customer leaves the Bank. The test included simulation of using a new banking system. In the control phase which is the last phase of the DMAIC methodology, new standards for the bank account opening process and control charts to monitor the key performance indicators in the future have been created.

It is crucial to state that LSS methodology creates a completed framework including specific improvement tools for achieving sustainable results in reducing the time rate in bank account opening process at PIB. In order to do so, it is recommended that the Bank should continue with the improvement actions, particularly when focusing on internal and external communication, practical trainings, periodic feedbacks and control activities.

Keywords:

Bank account opening process, Lean Six Sigma, tools, process improvement, communication, training, monitoring, control, measurement, continuous improvement.

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List of Abbreviations

AAU: Arab American University
DPM: Defect Per Million
EFQM: European Foundation for Quality Management
FATCA: Foreign Account Tax Compliance Act
HSBC: Hong Kong and Shanghai Banking Corporation
IBM: International Business Machines Corporation
JIT: Just in Time
KYC: Know Your Customer
LSL: Lower Specification Limit
LSS: Lean Six Sigma
NUMMI: New United Motor Manufacturing, Inc.
PIB: Palestine Islamic Bank
PMI: Project Management Institute
SMS: Short Message (or messaging) Service
TPS: Toyota Production System
TQM: Total Quality Management
USL: Upper Specification Limit
VSM: Value Stream Map
WIP: Work In Process

Chapter One

Introduction

1.1 Overview

This chapter includes a background and company profile of the Palestine Islamic Bank, and displays problem statement of the improvement work and thesis objectives briefly. In addition to these, the research questions and propositions have been demonstrated with the scope, approach and structure of the improvement work.

1.2 Background and Company Profile

Background:

The process of improvement is considered as proactive approach of defining, verifying and developing the current procedures and activities of the businesses related to banking sector to guarantee consistent growth and development at a level of high quality to meet customers' expectations, the severe competition and market segmentation (Appian, 2018). One of the largest Banks in Palestine is doing so, Palestine Islamic Bank (PIB) is determined to proceed in providing excellent Islamic banking services and to carry out progressive improvement activities (PIB's annual report, 2017).

According to "Internal source at the bank", PIB is currently working on achieving the ISO 9001:2015 certification and it is expected to be received in 2019. The bank management has approved to start the improvement schedule for a new bank account opening process to review, analyze, and comprehend the respective process and to identify the improvement opportunities of enhancing customer satisfaction, keeping good reputation, and gaining greater market share as

well as minimizing the total cost of overall related processes to achieve better performance and get more competitive advantages.

Company Profile:

According to the bank's website (2018), Palestine Islamic Bank (PIB) with its headquarters in Ramallah incorporated as a public shareholding company in 1995 and commenced its operations in early 1997. PIB is licensed by the Palestinian Monetary Authority ("PMA") as an Islamic bank operating in accordance with Islamic Sharia' regulations. PIB has an authorized capital of \$100 million and a paid-in-capital of \$74 million, to be increased to \$75 million by end of 2018. It was listed in Palestine Exchange Market in 2009. Referring to the declared data of the Palestinian Banks Association in January 2018, PIB was ranked as the third Bank in terms of its net profit. PIB annual report (2017) states that the bank is proud of being a retail bank focusing on excellence through its services and programs on individual and retail services and providing these services in accordance with Islamic Sharia' regulations. PIB conducts its financial, trading and investing operations through 37 branches and offices, emphasizing its identity as the largest Islamic banking network in Palestine. Palestine Islamic Bank provides Islamic Banking services by offering unique and innovative investment and saving programs. It strives to develop, capacitate and recruit highly competent human resources. It employs over 657 employees, and ensures effective contribution to the sustainable development of the community, socially, and economically.

1.3 Problem Statement

At PIB, the requirements of bank account opening process have been increased gradually according to the instructions of Palestine Monetary Authority, which have to be complied with the international banking laws and principals. These require more supportive documents and

protective procedures taking into consideration the increasing global risk among the rapid changes and complexity in the banks world (as the researcher's inference). This leads to slowness in opening bank accounts, customers' increasing complaints and resentment, obstructing the financial inclusion among the Palestinian society various components, and inflexibility and less productivity in accepting deposits.

1.4 Research Question and Propositions

- **Research Question:**

- Would improving the bank account opening process using Lean Six Sigma methodology increase the customer satisfaction?

- **Research Propositions:**

- Improving the bank account opening process using Lean Six Sigma will save the time needed.
- Improving the bank account opening process using LSS will increase the customer satisfaction.
- The performance of PIB accounts' opening officers will be developed through applying LSS project.

1.5 Research Objectives

This thesis is focusing on improving the bank account opening process at Palestine Islamic Bank using Lean Six Sigma Methodology. The specific targets include saving the time spent in opening a new bank account and reducing the customers 'waiting time at the Bank before their bank accounts are created in parallel with lessening the customers' requirements and documents needed

to accomplish and to prepare for opening an account, taking into consideration the protective procedures towards potential bank risks.

In more details, this thesis will shed light on many obstacles concerned by identifying the potential causes of the long time spent by both customers and staff when opening the account to be able to formulate practical improvement plan and to execute appropriate tools of Lean Six Sigma.

The stated thesis target is to save the time spent when opening a new bank account at least 20%. Noteworthy, the achieved result is saving the time by **61.4%**, which means achieving less customers' complaints and higher productivity with more customers' satisfaction. The thesis paves the way to make changes in other Bank's processes later through adopting LSS to guarantee progressive improvement approach.

1.6 Research Limitations

There were some obstacles the researcher faced during preparing this thesis that hindered him to generate a perfect work. In more details, due to the ongoing political situation in West Bank and Gaza Strip, the observed sample of PIB branches did not include Gaza Strip's branches to be observed closely, the feedback has been received from them via email and telephone. Another obstacle is that this thesis is limited to Palestine Islamic Bank as a banking services provider in Palestine. Therefore, the improvement outputs cannot be universally generalized to a considerable extent due to the extensive differences in strategic planning, approaches, internal environment, and disciplines. In addition, it mainly targeted the bank account opening process of PIB and not all other PIB processes which means that it is considered as a beginning of improving PIB's performance as all. Finally, the researcher found that there is severe lack of literature reviews related to bank accounts opening process specifically applying LSS.

1.7 Thesis Scope

The thesis scope was mostly limited to the Bank's internal employees, there were no external partners or parties involved from outside the Bank in this improvement work except specific interviewed customers and suppliers of a new banking system.

This improvement work covered the account opening process studied in 37 branches of Palestine Islamic Bank in the West Bank and Gaza Strip with special focus on customer service sections, as well as specific departments in the Head Office such as service development programs, work procedures, central operations, anti-money laundering (AML) and compliance. This study will not explore any other banking services like feeding automatic teller machine (ATM) or money transfer service, etc.

Although this thesis is based on one particular Bank, the tools as well as the findings and concepts can be used by other financing service companies. In addition, it has focused on a single process improvement work of practicing specific tools and concepts of Lean Six Sigma that can be utilized as a guideline and model of best practices in the Bank or other financial companies.

1.8 Importance of the Research

1.8.1 Lack of empirical studies:

Suffice to say that there are no literature review specialized in Lean Six Sigma to improve bank account opening process which has been internationally published so far.

There is observable deficiency of facts about examples of practical phases of LSS implementations in zones like the Middle East one. Also there are no completed studies that addressed LSS implementation with its critical factors in Palestine instance especially in the services sector. In

addition, there is a severe lack of Lean Six Sigma researches focus on one company in somehow services sector such as in the banking field. That's why this thesis is focused on one company Palestine Islamic Bank. It can be said that the current theoretical base of LSS Methodology to enhance this empirical study is not adequate since the origin of LSS is not familiar enough with this academic approach.

1.8.2 Lack of empirically sound LSS implementation models in Palestine

Implementing LSS has to be set at the head of management priorities of Palestinian service sectors to keep up with updates using creative thinking to guarantee the best ranking in the procedural aspects and good reputation in customers service and meeting the most appropriate expectations that would lead to lucrative business in local, regional, and international markets.

The study demonstrates applying creative methods and tools in descriptive and experimental essence that can be important source for improving organizations' business and for further studies to search deeply this methodology with its tools. In other words, the framework and outcomes of this thesis can be used in manufacturing banking formula in Palestine and everywhere even in any other similar services sectors to get utmost benefits of implementing Lean Six Sigma methodology of considering complying with the related regulations, customs, and standards. Palestine Monetary Authority could also use the methodology of this study and its tools to improve this process and other processes in the banking industry in Palestine to be adaptive and effective enough to compete regionally and globally.

1.9 Structure of the Research

The thesis structure contains nine main chapters; these chapters cover the following aspects:

The first chapter (the current chapter) contains a background and study case of Palestine Islamic Bank; also it briefly displays problem statement of the improvement approach with its objectives. In addition, the research question, propositions, importance of the study and limitations have been demonstrated with the scope and structure of the improvement process.

The second chapter covers many literature reviews related to lean in terms of its definition and origins with its core principles and pitfalls. Also, the origins of Six Sigma with its core principles have been covered with focusing on the common characteristics and complimentary features between Lean and Six Sigma, and the best practices for the application of LSS among various financial companies in many countries. Service quality in Banks and change management with Lean Six Sigma projects have been demonstrated too.

The following chapter (third one) covers the thesis methodology focusing on its purposes and types as well as discussing the DMAIC and PDSA models and data collection tools.

The next chapter (fourth chapter) presents the appropriate tools of defining LSS phase as follows: Project Charter, Problem Context Diagram, SIPOC, Team Contract, and the RACI Chart.

In the fifth chapter, specific tools of the measurement phase of LSS with "As it is" situation have been demonstrated including: Flow Chart, Value Stream Map, Eight Wastes, Quick Wins, Voice of Customer (internal & external customers), Voice of Process, Key Measures, data collection with Control Charts.

In sixth chapter, the following analysis tools have been used: Brainstorming, Cause and Effect Diagram and Five Whys tool.

Chapter seven includes testing theories, thesis results, preparing the improvement plan to implement the solution.

After completing the improvement steps, then the improvements need to be maintained by carrying out standardization with using of the control chart to monitor the new process as it is contained in the eighth chapter.

Finally, the ninth chapter displays conclusion of the improvement work of opening a new bank account process and recommendations presented to other studies and their contribution to the theoretical knowledge.

Chapter 2

Literature Review

2.1 Introduction

The journal articles, professional websites, scientific books and accredited thesis have mostly formed major sources of literature review. These sources are a composition of well-known theories, approaches and techniques used in Lean Six Sigma methodology. In more details, this chapter has covered many literature reviews related to lean origins, its core principles and hinders. The origin of Six Sigma with its core principles were studied with an eagle eye to concentrate on the common characteristics and complimentary features between Lean and Six Sigma, and their best practices in banking process development in many countries. Noteworthy, the Service Quality in Banks and Change Management with Lean Six Sigma Projects also have been discussed.

2.2 Origins of Lean

Lean is connected with gaining the most elevated number of advantages for a customer while decreasing time, effort and different resources (Rathilall and Singh, 2018). This approach is related to understanding what's crucial issue through which the value is brought, whether enhancing the procedures by which items are made, conveyed, and engaging individuals through critical thinking and training (Womack and Jones, 1996). Practicing Lean enables different companies to be competitive and creative in the market, which in turn enables them to develop and reach maturity and gain sustainability (Bhasin, 2011; Liker, 2004). When looking back at the origin of Lean and according to the "Brief History of Lean" the Lean Enterprise Institute (2000), Henry Ford was one of the early adopters of "flow production" approach in manufacturing field, which means merging the process of production with its chain practical steps. This approach appeared in

the 1920s and was considered a breakthrough in manufacturing environment. This included the procedure that single parts made by different machines then subsequently accumulated into a completed body. However, Dekier (2012) states that there was a limited output of manufacturing with a single design and color like model T car, the famous one in that time. Later when different automakers began to offer more auto sorts with various alternatives and colors, this brought more complex production systems that had more steps through the process. Complicated, speedier and larger machines were manufactured to reduce cost per process, while the increasing cost was appeared in total inventories and through output which organizations should pay more. After that, when diverse cars manufacturers started to introduce more kinds of automobiles with different options and hues, then this made more intricate creation frameworks that had more strides through the processes. This resulted in complex machines with more rapid and size were at last prepared for a few abatements in costs for each step of the process while expanding in inventories cost and expenses to the businesses.

Laine (2015) states that efficiency has been comprehended in parallel with resources utilizing, the most competent utilization of any resource includes assets that can be extended through, for instance, economies of scale. The idea is adjusting on to which extent the total amount can a machine make or what number of phone calls can a call officer process within a particular time? In a service industry, the customer and the flow of process start from the time a customer request is perceived and stop when the need is fulfilled. The main idea here is how brisk and how well can the company find out a solution to a customer's issue when it happens.

It can be said that after World War II, the core Lean concepts appeared in Japan through creating Toyota Production System (TPS) which was generated from car manufacturing industry. This term

became known as Lean Production or Lean Manufacturing (PHAM, 2017). Indeed, Japanese companies considered themselves behind the manufacturing sectors compared to companies in western countries after the War, especially when US cars' companies were using mass production and this was not useful to Japanese market. One of the reasons for this situation is that the market was relying completely on importing from other countries due to no skilled workforce provided when needed. Referring to Toyota model, the engineers started from the point of customer needs and from how they should meet them in a manufacturing sense. They discovered that with a progression of basic developments, they could enhance stability in their procedures as well as providing more various products and offer a wider variety in their product offering (Dekier, 2012). Figure 2.1 shows the elements of TPS and the foundational principles.

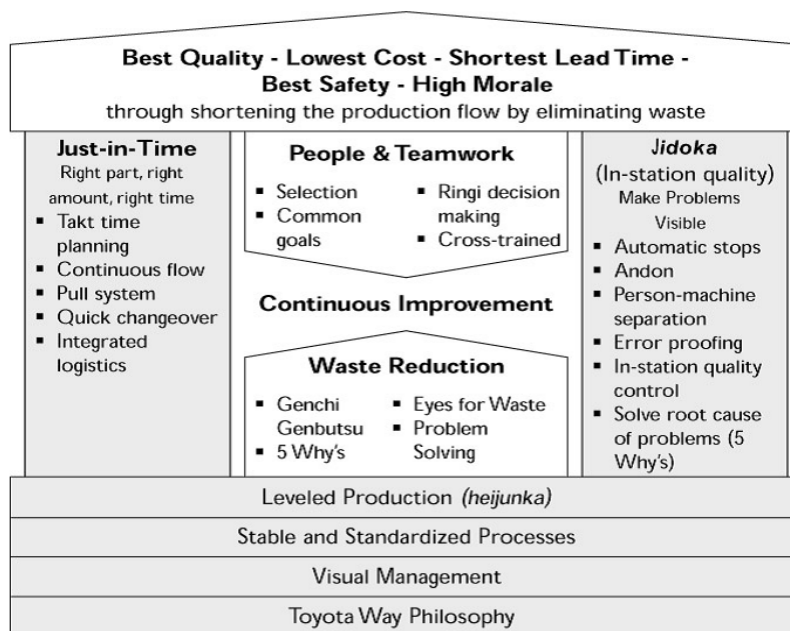


Figure 2.1 - The Toyota Production System

Source: Liker (2004)

The just-in-time concept is linked with reducing inventories and products according to the reduced demand which will be explained later, so that the TPS has been turned basically from individual machine level to flow of the individual product. Toyota reflected the point of offering self-checking machines to guarantee quality, right measuring machines for the genuine volume required, spearheading fast setups so that each machine could measure and create small volumes of many part numbers, and empowering each process step to ask in advance for the materials it requires, it is conceivable to get low cost, very quick creation, high levels of quality and variety and high assortment to react with changing in the customer's requests. It is important to say that the interested parties in the western countries had strongly monitored the Lean production and practices of Toyota. Lean Enterprise Institute (2000). It is crucial to state that TPS is currently known as Lean, it can be said that the term turned to working on improving the value and disposal of the wastes in all processes. Lean is concentrated in keeping the best value with the lowest overwork and cost. In addition, Lean has the instruments assisting to delete any pointless activities. There is an expanded requirement for applying lean with its tools in a way that help to guarantee speed, lower expenses, and high quality.

Lean success has been proofed in many companies around the world, according to Pepper, Spedding (2010) and Liker (2004), where the principal American companies think about the transition to a lean culture, General Motors deliberately reacted to the competition by setting up a joint venture with Toyota in 1984. Lean philosophy has played an incentive role among companies, taking example when New United Motor Manufacturing, Inc. (NUMMI) turned into a learning lab for General Motor's directors and designers to get technical information of TPS, also Mitsubishi has another story when it began a joint gamble with Volvo to minimize and eliminate the no value-

added activities, which in turn brought effectiveness, higher productivity and camaraderie in its journey.

According to Andersson *et al.* (2006) and Kilpatrick (2003), there is a survey carried out by National Institute of Standard and Technology (See <http://www.nist.gov/>) in 2003, revealed that generally the companies that implemented Lean had been developed in three fields as follow: operations, administration, and strategy, which means higher financial performance, better customers satisfaction, and reduction in errors of order processing.

2.3 Core Lean principles

Lean ought not to be just executed as an arrangement of techniques or tools to accomplish efficient production, but instead the all-encompassing trend that starts from the shop-floor to cover the whole organization, so that the achievement must be accomplished within prominent contribution and commitment by the seniors (Bhasin, 2011; Liker, 2004).

Lean reflects a culture where everybody is working with a high commitment for reaching differentiation. Lean is a way of thinking aims to eliminate wastes from a product's value stream and producing only what customers ask for, so that it's utilizing pull system (Womack and Jones, 1996).

Womack (2007) has briefly clarified three basic business issues that enable the entire organization to be guided for Lean transformation:

1. Purpose: Identify which customer's problems need to be solved?
2. Process: How to evaluate value streams to ensure each step is flexible, available, valuable, capable, appropriate, and connected by flow, pull and leveling?

3. People: How can the organization makes sure that value streams are assessed in a continuous basis in terms of Lean process, purpose and improved all the time?

Moreover, enhancing frameworks or achieving lean processes by diminishing expenses and rising speed while preserving quality is one of the improvement categories that lessening non-value-added activities in the process (Rakusa, 2016).Figure 2.2 shows briefly the 5 key Lean principles in a gradual way:



Figure 2.2: Lean Principles

Source: Lean Enterprise Institute (2018). <https://www.lean.org/WhatsLean/Principles.cfm>.

The main point stands by the advancement of Lean administration is the disposal of waste as Arnheiter and Malayeff (2005) stated. Wastes are portrayed as all works and developments that don't develop the value of an item in the process. Endeavors that concentrated on the decrease of waste are followed through events of kaizen.

As Liker (2004) pointed out, Toyota has identified seven major types of non-value-adding waste in business or manufacturing process, the 8th waste of non-utilized talent or 'Skills' of workers was later appeared after 1990 in parallel with the western countries start utilizing from when the TPS, the 8 wastes (or Muda- Japanese word) are gathered in a symbol "DOWNTIME" that includes:

- (1) **Defects:** contain making defective items or amending exertions, scrap, rework, production for replacement, and inspection results in dealing with inefficient items and processes that require handling, time, and effort. Also, generating costs to the processes with no value-added to the customer.
- (2) **Overproduction:** producing products or services with no orders that result in such storage, wastes and overstaffing. In offices, overproduction means creating copies no one reads, providing extra reports with more information than needed, it also reflects provisioning a service before the customer is ready. In the manufacturing environment, it includes generating more items than required that needs costs to maintain.
- (3) **Waiting:** means the time on hand while the workers in the manufacturing facility solely serving to keep an eye on the automated machine, standing around till the next step of processing, waiting for arriving the materials or even with no work to accomplish due to equipment breakdown and delays in processing. In the office environment, waste of waiting could embrace having letters and documents waiting for rehearsal, waiting responses of others to an emails, useless meetings, and waiting for startup of the electronic advices and software programs.
- (4) **Non-utilized talents:** despite the fact that it wasn't provided in (TPS), a lot of professional parties recognize that the waste of unused skills of people is a vital item to be considered. In case the organizations managements are not closely interacting with the employees then they will not recognize the abilities of their hired humans. In other words, in spite of the fact that the employees' role is to simply follow orders and execute the work as planned, but they were considered the most competent staff of diagnosing obstacles and suggestions. When not involving the front office staff, not asking for workers' feedback,

and positioning them in low level of tasks comparing with their qualifications and abilities, then it would lead to a vast gap between the management and its employees, with not benefiting from the employees experiences, knowledge, and skills, which result in hard to develop the desired procedures and work as all.

(5) **Transport:** Transportation waste reflects the unnecessary movement of products, equipment, people, inventory, and tools. It would lead to items demolish, people, expenses and time exhaustion. When determining manufactured products, materials needed in the work have to be accessible easily and used rationally as it should be and to avoid what so called excessive usage of them.

(6) **Inventory:** Excess raw material, WIP, or finished goods inventory could be resulted from making products exceed the customer demands, which in turn consuming times more than required, obsolescence, disrupt items, expenses for storage and transportation, and postponement. Excess inventory obstructs production leveling, suppliers' late conveyances, long setup times, defects and equipment breakdown.

There are many examples about this kind of wastes in office environment like; folders of documents waiting to be accomplished, unused archiving for a long time in a database or on the office shelves.

(7) **Motion:** any needless movement of people, devices, or folders is considered as a waste in motion either when walking, bending or moving. Acts in the work that require too much motion have to be designed to improve the personnel job to achieve safety and health. There are many examples of what is meant by services and product industries; Sifting to find the needed things, entrance to data many times, a lot of mouse clicks, excessive movement from production location to the equipment ones.

(8) **Excessive-Processing:** this means accomplishing a lot of work with more components and steps to provide product or service than customer needs. It may consider that weak tools and product design are major reasons to inefficiently processing which cause production defects. Making products with better quality than is necessary could cause inefficiency too. The same thing happens to more detailed reports than required, needless signatures on a lot of pages, triple entry of data, using many forms than needed, and having an extra step in a workflow are vital example on this kind of wastes.

Studying the different utilized Lean tools to recognize wastes and value-adding activities in various processes, it can be said that the “Value Stream Map” (VSM) is considered as one of the most important Lean tools derived from “Just in Time” (JIT). These two concepts are clarified as follow:

A- Value Stream Map:

VSM is a lean tool used to give a dependable qualitative analysis to provide task frame by characterizing the current state and desired future of the system (Pepper and Spedding, 2010). It provides the material and information flow as they are in implicated processes, shows the visual status of the production processes, and its linkage with separating non value-added and value-added activities. In other words, VSM does play an important role in improving processes and keeping continuous improvements taking into account the probabilities of wastes. It has examined its uniqueness and benefits of spotting the light on the value-added and non-value-added activities to take corrective action accordingly. VSM recommended as a first step needed to be taken when implementing Lean production (Womack and Jones, 1996). Also it currently depends on systems linked with information technology. According to Gurusurthy and Kodali (2011), the utilization of VSM using software programs gives executives and decision-makers more scientific

information and predictable analysis for their projects and businesses to prevent any no-added value activities.

Below are explanations for the main terms contained in VSM tool used in this study:

- **Cycle Time:**

Wavhal & Kashikar (2017), defined the **Cycle Time** is the time required for performing various machining operations on the product at workstation. It is the total time elapsed for converting raw material into the finished product. It not only includes service time for machining but also comprises of the idle time or setup time between two consecutive operations. It is a direct measure of process and equipment performance. In addition, cycle time as defined by the organization and their customer, is the total time from the beginning to the end of process. Cycle time involves **Process Time**, during which a unit is acted upon to bring it closer to an output, and **Delay Time**, a unit of work is spent waiting to take the next action. In addition, Ashwinkumar Arivoli et al. stated that the **Tact Time** is the average time between the start of production of one unit and the end of production of that unit or the start of production of the next unit.

- **Downtime:**

It is the time stopped during production due to pending setup for an operation or during making repairs. It reflects inactive time like time between periods of work. It is also known by the period when the system is unavailable because of unplanned stoppages like hardware failures or process disruption, or planned stoppages if there should be an occurrence of predetermine procedures of activities that considered as calculated duration through which the machine has to be stopped for the planned maintenance, systems upgrade, setups, adjustments, inspections, shutdowns, training, breaks, and cleaning (Muchiri and Pintelon, 2008).

- **Lead Time:**

Cotteleer & Bendoly (2006) have simply defined the lead-time as the time between order placement and receipt of the shipment, meanwhile Heikkilä (2002) provided considerable clarification of lead-time to cover the time spent in customer order preparation by the customer, sending/ order placement or communication, order receipt by provider or supplier, order preparation by provider or supplier, shipment, customer receipt and verification of the receipt as against the placement. Relating to commercial banks, Walters defined the lead time where it contains the time a customer prepares and places the request for a service at the bank, the time spent by the officer of the Bank in working on the request, the checks and balances time spent by both the officer and the customer, and the time spent on any other activity to get the customer request delivered. Examples on requests at the Banks could include account opening, application for loan, cash withdrawal, cheque order or balance enquiry.

B- Just in Time:

JIT is a technique whereby the production lead time is extremely abbreviated by keeping up the harmony to changes by having “all processes produce the necessary parts at the necessary time and have on hand only the minimum stock necessary to hold the processes together” (Sugimori et al., 1977). The most critical factor that makes the base for applying just-in-time is the pull system. Following on the footsteps of a comprehensive strategy of American conventional mass production technique to push system basically, Toyota chose to actualize the pull system where generating a new products and materials is activated at a specific level of utilization. In the pull system, the succeeding phase demands and withdraws in-process units from previous stage just as indicated by the rate and time the succeeding stage consumes the items (Deleersnyder et al., 1989). In parallel, Kanban cards are small cards distributed to request a replenishment action when

a safety stock level is reached. Also they are used to indicate material order points, how much material is needed, from where the material is ordered and to where it should be delivered (Kilpatrick, 2003).

It can be said that many authors didn't focus enough on lead time reduction through literature of lean and (JIT) (Lampinen, 2013; Schonberger, 2008; Chandler, 2007; Holweg, 2007), but realizing the lead time reduction was firstly encouraged within the two concepts of lean thinking and JIT production, which in turn enhanced the waste elimination that contains a considerable impact on time reduction and elimination of non-value adding activity. Harrison and Van Hoek, (2008) have provided a perfect definition for competing on time as follows "the timely responsiveness to customer needs" which reflects meeting customers' needs on time in fields like: price, variety and quality. Lean tools are not designed just for addressing wasted time or costs; rather, they focus on reducing lead times and streamlining processes in the aim for producing better quality or better service as in any standard manufacturing environment. Lean tools help by reducing complexity while increasing quality and speed. It can be said that Lean tools play major role in facilitating the steps in parallel with improving the quality and rapid response to get customer satisfaction. They are effective tools for both environments of manufacturing and services when considering them as a set of principles that can accelerate the speed of all processes across the whole enterprise which they are applied in.

2.4 Pitfalls with Lean

In contrast, there are some shortcomings in Lean which was addressed by Arnheiter and Maleyeff (2005), Hines *et al.*, (2004) and Pepper and Spedding (2010). There is a perception claimed that Lean principles lack the sense of data-driven approach; also, the claim that Lean is not having

international sense for job-shop companies, where huge product portfolios with so many different features had prevented the standardized work which resulted in low volumes productions.

It is very important to mention that Lean must be seen as dynamic goal or strategy and not just a limited method but rather high-level concept should be tied to an overall business strategy for guaranteeing continuous improvement.

2.5 Origins of Six Sigma

Six Sigma symbolically is reflected by 6σ , which expresses a pool of tools for quality management aiming to improve the process in parallel with reducing variability to reach perfection or near in quality sense. In other words, it is a statistical approach driven by project-management established and developed by Motorola Corporations in 1987 and specifically by Motorola's engineer Bill Smith. After that, Six Sigma became popular through a well-publicized work of Jack Welch, CEO of General Electric in 1995 (Brady and Allen, (2006).

2.6 Core Six Sigma Principles

According to Kwak and Anbari (2004), Six Sigma is highly disciplined (or structured) improvement methodology that enables organizations to deliver better or nearly perfect products and services, also it is a quality philosophy and the way of improving performance by knowing where you are and where you could be, so as it is considered a methodology to measure and improve company's performance, practices and systems (Pyzdek, 2003).

The importance of Six Sigma can be summarized with the following points:

1. Six Sigma emerged as a natural evolution in business to increase profits by eliminating defects.

2. The current business environment demands and rewards innovation more than ever before

because of :

- Customer expectations.
- Technological change.
- Global competition and
- Market fragmentation

However, the basic Six Sigma premise is as follow:

1. All processes have variability.
2. Each variability has causes.
3. Typically, only a few causes are significant.
4. To the degree that those causes can be understood, they can be controlled.
5. Designs must be immune to the effects of the remaining uncontrollable sources of variation (robustness).
6. This is true for products, processes, etc.

Six Sigma includes a pool of techniques and tools for improving the process to get maturity in delivery of products and services as well as in customer focus. The goals of Six Sigma are to lowering variation and defects so that processes could be more predictable and consistent. The large amount of money which has been saved by companies is the major reason that made Six Sigma so popular.

GE (2015) states that Six Sigma at GE roll around the following key concepts:

1. Critical to Quality – those attributes that customers value most and measure.
2. Defects – not delivering what is valuable to the customer.

3. Process Capability – how capable is your process in meeting customer specifications.
4. Variation – inconsistency in process outputs.
5. Stable Operations – how predictable is the process performance.
6. Design for Six Sigma: creating designs that meet customer needs.

A Six Sigma process means a process efficiency of 99.9997%. To achieve Six Sigma, a process must not produce more than 3.4 defects per million opportunities where a defect is categorized as anything outside customer specifications. Table 2.1 demonstrates accurately the six levels of sigma with defects per million opportunities:

Table 2.1: Sigma Levels

Sigma Level	Defects per Million	Yield
6	3.4	99.99966%
5	230	99.977%
4	6,210	99.38%
3	66,800	93.32%
2	308,000	69.15%
1	690,000	30.85%

All enterprises include defects which result in slowing in productivity and inefficiency. Six Sigma aimed to fulfill customer's desires and accomplish more effective tasks for sustained success to various businesses.

Six Sigma is an application of the scientific method to the design and operation of management systems and business processes, which enable employees to deliver greatest value to the external and internal customers. According to Koning and Mast (2005) that state the scientific method works as follows:

1. Observe some important aspects of the market place or business.

2. Develop a tentative explanation or hypothesis consistent with business.
3. Based on hypothesis making predictions.
4. Test predictions by conducting experiments or making further careful observations. Record observations. Modify hypothesis based on new facts. If variation exists, use statistical tools to help separate signal from noise.
5. Repeat steps 3 and 4 until there are no discrepancies between hypothesis and the results from expectations or observations.

According to James and Lindsay (2005), there are key concepts of Six Sigma roll around specific points: Think in key business processes and customer requirements, also the overall strategic objectives are highly considered in this study. To focus on corporate sponsors responsible for backing projects, support team activities, help to overcome resistance to change, and obtaining resources. To emphasize such quantifiable measures as defects per million opportunities (dpmo) that can be applied to all parts of the organization. Moreover, to ensure that appropriate metrics are identified early and focus on business results, thereby providing incentives and accountability. To provide extensive training followed by project team deployment. In addition, to create highly qualified process improvement experts (green belts, black belts, and master black belts) who can apply improvement tools and lead time. Finally, to set stretch objectives for improvement.

Following this trend, Six Sigma mainly depends on 5 phases for improvement indicated by (DMAIC) which is considered as a frame work used through the study period and management cycle that includes improvement steps based on the facts and numbers on the ground. Moreover, Snee and Hoerl (2003) and Linderman et al., (2003) stated that PDSA tool (Plan, Do, Study and Act) is linked with every step in the DMAIC methodology.

Qian (2014), Selvi and Majumdar (2014) asserted that DMAIC methodology contains: Define Measure, Analyze, Improve and Control, where each one is explained below:

1. It can be said that the "Define" stage means to select priorities and ask the question “which process needs to be improved?” it aims to determine the problem, specifying the objectives and goals based on voice of customers and voice of process in parallel with knowing the current abilities of various kinds of assets to prepare for scheduled and applicable plans to overcome the potential obstacles and accomplishing the targets recognizing existing resources, scope and duration of the project.
2. The second stage is “Measure” which is used to learn about the process and the current performance when collecting data as well as getting the VOP and the VOC to quantify the current problem and use it as a reference for improvement.
3. In the "Analyze" stage, the focus is on investigating and understanding the root causes of the problem, variation and waste in the process.
4. During the "Improve" stage, theories of solutions are tested, results are studied and implemented.

The final stage is the "Control" stage which starts after implementing the solution, in which the changes in the process are standardized, results reviewed, process is monitored, and future plans are defined.

2.7 Lean Six Sigma

According to Sheridan (2000), the “Lean Six Sigma” term reflects a management system that includes combination of Lean and Six Sigma. Furthermore, Lean Six Sigma is defined as a methodology that focuses on the elimination of waste and variation, following the DMAIC

structure, to achieve customer satisfaction with regards to quality, delivery and cost. It focuses on improving processes, satisfying customers and achieving better financial results for the business (Salah et al., 2010).

Lean Enterprise Institute (2000) characterizes that the major thought of Lean is to make more benefits for customers with less resources. In other words, expand what customer's value and stop waste. Six Sigma is a customer centered approach and a statistical method of numbers which helps achieve process perfection. It gives an organized casing work to accomplish sustainable outcomes with concentrating on statistical instruments to drive choices on diminishing variation and the quantity of imperfections. Arnheiter and Malayeff (2005) stated that there categories of improvement are available: Disposing of quality shortages, for example, achieving customer desires or needs, removal of errors or reducing holding up times. Enhancing frameworks or achieving lean processes by diminishing expenses and rising speed while preserving quality. This can be lessening non-value-added activities in the process. The third is going beyond customer desires by giving more value to customers. This can be improved to get newer products or services.

2.8 Lean and Six Sigma- Common Characteristics and Complimentary Features

Drohmereski (2014) states that Lean and Six Sigma has to be considered as complementary strategies for each other where they are converged to the same purpose despite having different features and starting points. According to a research accomplished by Antony (2011) that contains leading practitioners and academics perceptions of comparison between Lean and Six Sigma depending on the differences and similarities, it is much vital for the approach integrating both Lean and Six Sigma with its long-term results, while both of Lean and Six Sigma have a

complimentary feature and couldn't run perfectly in isolation of the other. A common characteristics and complimentary features for the two are briefly shown as follows:

Lean and Six Sigma- Common Characteristics and Complimentary Features

Common characteristics	Complimentary features
1. Both of them introduce integral instruments combinations and require extreme learning of those instruments;	1. Lean tools are simple and straightforward and focus on finding quick solutions, while Six Sigma has more complex tools;
2. Both are broad process change techniques and help to recognize opportunities for enhancements;	2. Six Sigma offers statistical and data-driven approach while Lean does not have;
3. Both improve critical thinking ability of individuals;	3. The utilization of Six Sigma brings better bottom line improvements with the reduction of cost of poor-quality items, while Lean does not deliver such dramatic financial results;
4. Both need administration's help and commitment;	4. Six Sigma works for improving process effectiveness through disposal of variation, while Lean spotlights on wiping out wastes and other non-value adding activities to enhance process efficiency;
5. Both pay attention on customers' need and go for conveying most noteworthy	5. Six Sigma has more complicated tools and statistics, while Lean instruments are basic, clear and pay attention to discovering quick solutions;

value to the customers and the association;	
6. Both utilize multi-specialty group;	6. Lean is valuable for daily follow-up, while Six Sigma is suitable for long-term and complex activities;
7. Both can be implemented in service environments.	7. Lean does not follow statistical and data-driven approach comparing with Six Sigma;
	8. The usage of Six Sigma has more financial benefits, while Lean does not accomplish such dramatic fiscal outcomes;
	9. Six Sigma is using obvious and accurate approach from within DMAIC methodology that enables its specialists in improvements visibly, but this matter is not founded in Lean so as it's hard to comprehend to choose the useful tools in the right time;
	10. It is so easy that individuals of all levels from shop-floor employees to top directors to use tools of Lean, but Six Sigma tools are not easy to use by any ordinary worker so that it needs intensive training programs.

	11. The investment in Six Sigma is more popular comparing with Lean;
	12. Lean can help executers seek more details to understand what is happening, while Six Sigma enables them to look for chances to analyze the obstacles in more logical ways.

Arnheiter and Malayeff (2005) state that companies implementing only Six Sigma or Lean solely may face gradual losses, so the advantages of implementing the integrated approach of Lean Six Sigma have been demonstrated in numerous organizations from largest to smallest ones across industries. The important advantage is incrementing profits in parallel with lowering the costs.

DeKoning et al. (2006) stated that Lean Six Sigma methodology has proofed its advantages in both manufacturing and services sectors. A project concentrating on reducing of the cost of €1 million for contracting impermanent staff done by the Red Cross doctor's/ Netherlands, the project was led by green belt team of the hospital who deployed DMAIC process and depended on the analysis of root causes, also used visual management system beside the standardization, and so forth; the task at last has saved around €200,000.

According to Ahmad (2014), Lean Six Sigma is extremely considered as a powerful combination, as it combines the strengths of each system as the following:

•Lean	•Six Sigma
Operating system according to guiding principles	Focus on voice of the customer
Relentless elimination of all waste	Data and fact-based decision making
Creation of process flow and demand pull	Variation reduction to near perfection levels
Resource optimization	Analytical and statistical rigor
Simple and visual	
Strength: Efficiency	Strength: Effectiveness

It is important to state that efficiency reflects performing in the maximum possible way with the minimum waste of time and effort where improving efficiency requires eliminating waste. Also lean philosophy is about realizing the process, finding wastes, avoiding mistakes and documenting the done work. In addition, effectiveness is a measurement reflects how well the output of a process meets customer needs. It is related to customer satisfaction and linked with Six Sigma which concentrates on process deviations and minimizes defects to 3.4 PMO.

By the way, here are some explanations about specific LSS tools used in this study:

-Project Charter:

A project charter clarifies the project framework and its approach. It marks all of the stakeholder's names since it is an important tool of the beginning of the project management and the phases of the project planning. The organization basically depends on the project charter during the whole

project period. The project charter is a document that approves officially and clarifies the project limits; it is significantly more than an adequate planning tool (Enani, 2015).

Furthermore, it avails as a guide, escorting the project through the accomplishments that will hint the advancement of the project. This effective tool should be in parallel with the business need of the project which links the project to the whole strategy of the company. Once the project charter is being approved by the shareholders, one cannot change or modify the actual charter without the consensus of all the involved parties (Schwalbe, 2008).

-SIPOC:

SIPOC is a Six Sigma tool used three decades ago at IBM (International Business Machines Corporation). This tool is often benefited by Black Belts of Six Sigma to define the whole related parts of a business process prior to launching an improvement activity for that process. It supposed that any value-adding activity is probable to be contained in a supply chain, which has been used to identify the processes at a high level, develop communications, document algorithms, design, and curricula training improvement (Radziwill, 2011). Using SIPOC could be benefited to review periodically every element of the five's contents of the tool to find any changes in response to changes in the external environment.

Improvement Skills Consulting (2009) states that to prepare a SIPOC process definition, there are activities accomplished to convert the inputs into outputs. In other words, these activities considered to be fundamentals of a process map as follows: 1. Provide with the process name. Apply a format of Verb + Noun (e.g. Open Account). 2. Determine the process outputs. These are the substantial items produced from the process (e.g. article, or e-mail letter). 3. Mark the process customers. Those customers are the ones who will use the Outputs. All outputs have to be utilized

by the customers. 4. Determine the process inputs. These are the items that trigger the process and mostly created according to customer request. 5. Define the Suppliers to the process. Those are the persons who provide the inputs. 6. Specify the minor-processes that formulate the process.

- **RACI :**

RACI is a pronounced acronym (ray-see) that stands for: Responsible, Accountable, Consulted and Informed. It is a matrix chart containing the activities with authorities of decisions in the company, where every role in specific tasks should be carried out by someone. It visually demonstrates each activity in the project with the person role in the team according to that activity (Tiziana, 2010). It is an effective tool used to facilitate the workflow and to maintain the excellence, discipline, and support in preparing communication and change management plans.

Responsible (R) Team members assigned as Responsible, execute the recognized function and do the work. This individual or more than one help the person accountable to accomplish the coveted result. They are responsible for the quality and timing of the particular task and for understanding inputs/ outputs and hand-off duties of the action.

Accountable (A) Accountable people are accountable for delivering the service, product or program as required and on time. Accountable person should approve when the decision is made or the objective is achieved as he/ she is considered the ultimate decision-maker.

Consulted (C), this term is linked with a huge and complicated initiative. For example, applying a telework arrangement, which require input from many sources. Mostly, the individuals are assigned to achieve specific work that may need feedback, advice, and consultation from experts and executives. Managers sometimes need to consult experts about the process before making right decisions. Consulting parties in turn have to provide

input and help those Accountable and/or Responsible to understand the whole ramifications of their actions and decisions.

Lastly, **Informed (I)**, those parties who should be informed how to identify a periodic workflow, decision or the activity progress. On the opposite of those Consulted, the one-way communication way with the informed people don't contribute to make decisions straightly.

- **Brainstorming:**

Brainstorming is generation technique of creative ideas and professional method for problem solving. It provides wide space to introduce personal ideas with no criticism from any party. The created idea is written down to be considered as solution to a problem (Kumbhar, 2018). According to Osborn (1963), Brainstorming is a tool for maximizing creativity of group in problem solving. This tool is considered to be a conference method by which a people try to get a resolution for a determined problem by accumulating every discussed idea off-hand from its members. Osborn (1963) mentioned four general rules of brainstorming to increase the overall creativity of the group:

- 1- **Focus on quality:** this resulted from maximization in the quantity by generating more ideas which assist to produce creative ideas and solutions with high quality.
- 2- **Don't criticize:** it is crucial to avoid criticizing the posted ideas. Hold the estimation on those ideas and encourage the members to generate more ideas since criticizing any idea may prevent some members from presenting ideas freely because they feel shy to ask something unprecedented.

3- Welcome unusual ideas: recording the generated ideas especially the unusual thoughts are welcome so that it could assist to find out further ideas that may help to provide creative ideas to another group members.

4- Improve ideas: the creative ideas would need adjustment to be more appropriate through generating more appropriate idea and involve it for further solution after discussion.

- **Cause and Effect Diagram:**

A cause-and-effect diagram is a tool that assists to identify, sort, and demonstrate potential reasons of a particular problem. Graphically, it clarifies the relevance between a determined result and the factors affecting that result. It is also known by "Ishikawa diagram" because it was invented by Kaoru Ishikawa, or a "fishbone diagram" because of the way it looks (Basic tools for process improvement, 2009). The structure that the diagram displays assists team members to think in a very systematic way.

The process contains four steps: identifying the problem; working out the major factors involved; identifying possible causes and analyzing the cause and effect diagram, which are used to resolve numerous problems including risk management in production and services (Dey, 2004). Moreover, the diagram could be utilized to specify the risks of the causes and sub-causes of the effect, but also of its global risk (Ciocoiu, 2008).

- **5 Whys Tool:**

The "5 Whys" is a basic critical thinking method assist in problem-solving when finding out the causes of the problem rapidly. Popularity was made during the 1970s by the Toyota Production System, the 5 Whys methodology assist to define the root cause of a problem rapidly, which is

easy to be taught and implemented by looking at any problem and asking: "Why? "What caused this issue?" when it is answered to the first "why" then another "why" being asked and so on. Serrat (2009) states that the Five-Whys exercise is immensely enhanced when implemented by a group and there are five essential strides to directing it:

- Gather a group and build up the issue explanation in convention. Then, choose whether extra people are expected to contribute in resolving the problem or not.
- Ask the first "why" to the team: why is this or that problem happening? There will probably be considerable responses: write them down all clearly.
- Ask four more successive "whys," repeating the process for every statement. Post each answer close to its "parent." Follow up on every single conceivable answer.
- You will have recognized the root cause when asking "why" yields no further helpful data. This opportunity is important, keep on making inquiries beyond the discretionary five levels to know the root cause.

Among the dozen or so replies to the last asked "why" search for fundamental causes of the issue. Talk about these and settle on the probably fundamental reason.

Pursue the group session with debriefing and demonstrating the final item to affirm that they see rationale analytically.

- Subsequent to settling on the most likely root cause of the problem and getting affirmation of the rationale beyond the analysis, create proper corrective actions to overcome the root cause of the system.

2.9 Lean Six Sigma & Best Practices in Financial Companies Process Development

Banks today are working hard to differentiate themselves from each other in meeting the customer's needs. It is well-known that the customer mostly asks for decreased prices and

discounts with offers, quick service and good quality. In parallel, Pepper and Spedding (2010) and Liker (2004) stated that the supplier whether in service or in manufacturing industry is being asked to work intelligently to achieve the customers' requirements with minimal material costs, providing attractive competitive advantages with short lead time and good enough quality s to be able to sustain and satisfy customers.

Generally, customer loyalty and retention have strong linkage with the offered quality as well as with the increase or decrease in returned product and services, or in other words, the bad feedbacks will eventually generate decrease in revenues and profits which in turn result in decline of market share. Lean Six Sigma methodology and its pool of tools and techniques are professional options for businesses to get more productivity with less cost, whether in production cycle time or enhancing capacity and eliminating the variation as low as possible to get better quality in services and manufacturing fields. This absolutely will create massive productivity, better reputation and increased profits (Drohomeretski et al., 2014).

Anexas (2017) confirms that Six Sigma and Lean solutions have helped many financial services and Banks to develop their internal processes. Typical applications of Six Sigma and Lean in most vital banking processes have generally reduced the cycle times for opening accounts and credit cards issuing, loan processing, profile changes, credit, and fund transfer. In addition, reducing errors to outstanding levels in transferring funds and profile updates, names as well as addresses, and amounts.

In more details, there are many success stories for financial companies around the world that implemented structured Lean Six Sigma methodologies in their processes as follow:

- **Roma Finance**

Martin Greenland (2017) states that Roma Finance, a mortgage lender situated in Manchester, England, revealed the execution of a major Lean Six Sigma project to get full understanding of each part of the connecting procedure. Because of the change in 45 activities, Roma made 20 noteworthy wins in July 2017. Utilizing the voice of the customer, Roma discovered that the key drivers of customer attraction are availability, speed of conveyance and straightforwardness. By concentrating on the season of the session in finishing these particular tasks, Roma could finish over 70% of the new business within 15 days, the normal average completion time in the industry is 43 days. Scott Marshall, managing director at Roma Finance, said: "It has been enabling analyzing each part of an exchange with another point of view, we've tested the way we worked, interrogated information and utilized innovation to change the way we work together so as to really diminish the time allotment in which a loan can complete, without increasing lending risk. He assures that "Although we only implemented the last stage of our project just over a month ago, we have already managed to complete more than 70% of new business within 15 days".

- **Commonwealth Bank of Australia (CBA)**

Commonwealth Bank of Australia (2016) has published article titled "recognized process excellent" which stated that Executive of Enterprise Services has got an award through the Process Excellence Week Conference. The CBA group is used to be motivated to meet the customers' needs. In more details, after launching its Process Excellence program in January 2004, with a primary focus on building individual capability through Lean Six Sigma (LSS) projects, CBA has refocused the productivity effort, strengthening the links between Productivity Excellence, core values and the customer experience.

CBA Group Executive of Enterprise Services David Whiteing proudly accepted the CEO of the Year Award on behalf of Ian Narev. He said, "Over the past four years, we have undergone enormous transformational change. Our people are now thinking about processes end-to-end, looking closely at how they're measured, and making informed decisions that help our customers achieve their goals".

In 2012, the Bank introduced four productivity habits, which now form part of everyday work practices, linking closely to the Bank's core values of integrity, accountability, collaboration, service and excellence.

- **Capital One**

Aravind Immaneni (2007) said that at the point when Capital One Direct Banking business move in technique has driven direct saving money, Capital One Direct is moving toward another path, the company, equipping itself with the mastery and capacities of Six Sigma, has changed its administration model, upgraded its center business forms and built up a customer driven culture. After three years, partners have grasped this new culture of customer center and promise to constant change - all with fortunate outcomes to the end. The Direct Banking business has been perceived inside at Capital One and through outside organizations with various honors for this wonderful cultural change.

2.10 Service Quality in Banks

Banks have a vital and effective floor in the economic and financial advancement of a country. A dynamic banking system extremely impacts the development of nations in different fields of the economy. Specialists in the banking industry confront an expansive number of complex difficulties

in the worldwide enterprise. It is pivotal for Banks to deeply comprehend rapid changes in customer demands, and adopt the most developed systems of information technology, and upgrade the various software programs and systems to compete more effectively with global organizations (Malhotra & Mukherjee, 2004). Banks that ace service quality can get a competitive advantage and higher revenue, customer loyalty and retention (Kumar et al., 2010). Considering adequate service quality means keeping the current customers and recruits new ones, reducing expenses, strengthening organization position, generating positive recommendations related to word-of-mouth, and increasing profitability. According to (Kane & Valury, 2005) that states there are ten major dimensions of quality that define the service quality regarding to the perception of the customers as follows:

Table 2.2: Quality Dimensions

The Dimension	The Definition
Reliability	Degree of consistency in service performance and submission of the first time correctly.
Response level	The speed of response of service providers to the demands and needs of customers.
Efficiency and capacity of service providers	Ownership of individual service providers for capabilities that enables them to provide outstanding customer service.
Accessibility	Easy access to the service providers and contact with them when necessary.
Courtesy	Good customer treatment and appreciation of their own circumstances.
Connection	Exchange information about service between service providers and customers in an easy and simple way.
Credibility	The availability of a high degree of trust in service providers by taking into consideration the interests and needs of customers.
Security	Freeness of bank transactions.
Attention, care and upkeep	Be by making all efforts to notify the customer.
Tangible physical and human aspects	Includes the exterior of equipment and personnel.

Specifically, the five prominent dimensions in the quality philosophy are explained as follows:

Tangibility factor reflects physical facilities, equipment and appearance of work force. Patterns of these physical ones in Banks include convenient store layout, developed equipment for customer's use and adequate employees to provide services. These sides are critical for retail

Banks, shedding light on the fact that there are extensive and direct interactions between the customer and the service provider. Subsequently, keeping up a convenient workplace can enhance customer loyalty. The **Responsiveness** is also considered vital dimension which means the desire to assist customers with provisioning immediate service. HSBC (Hong Kong and Shanghai Banking Corporation), is a model Bank responding to their customers and reinforcing customer satisfaction when incorporating the due date statement on SMS alerts sent to cardholders (Lau, Cheung & Lam, 2013).

The third dimension is **Reliability**, which means that Banks permanently give extreme confidentiality terms to the customers during transactions. Reliability reflects the capability to carry out the announced service constantly and precisely. The reputation and trust are considered when attracting customers' attention to invest much money. Also, the credibility that the service providers extend to every customer is highly valued in banking service with being aware to the individuals' desires and requirements; this could be utilized by realizing the customers' estimated retirement age, annual income, and interests that needed to assist in providing a valued match of insurance and fund products for customers. This meets **Assurance** term which expresses the courtesy and knowledge of employees and their capabilities to create confidence and trust especially with Bank commitments, this could save huge amount of money at the Bank. Lastly, **Empathy** is linked with the stances like when employees show recognizing the needs of customer with displaying customized attention with readiness to solve customer problems. Provisioning services to the customers friendly would satisfy customers when they go into a Bank (Van Iwaarden et al., 2003).

2.11 Change Management with Lean Six Sigma Projects

Lean Six Sigma is an improvement methodology for excellence of companies and organizations that have become widely known and have acceptance since 1990s. However, businesses are not enough benefited from Lean Six Sigma in terms of transformation as well as financial gains.

According to Prosci (2014), change management is "the process, tools and techniques to manage the people side of change to achieve the required business outcome". In addition, change management is determent as 'the process of continually renewing an organization's direction, structure, and capabilities to serve the ever-changing needs of external and internal customers' (Moran and Brightman, 2001: 111). Burnes (2004) states that change is an ever-present feature of organizational life, both at an operational and strategic level. Accordingly, change management combines the companies' tools that could be used to assist people get successful individual transitions that lead to the change realization and adoption. Its implementation means to be either impacting the job roles, systems, or organization structure or even processes.

Lot practitioners of Lean Six Sigma disregard the crucial role of the effectiveness organizational change management in gaining the prosperity of the related projects. The DMAIC methodology of Lean Six Sigma introduces a considerable utilization of its tools in terms of gathering, analyzing data with defining the root cause of the problems as well as coming up with improvements (Salah et al., 2010). In contrast, the DMAIC presents little pet direct instruments for organizational change management to incorporate the ones who will be influenced by the change efforts of the Lean Six Sigma. Too often, Six Sigma professionals lack change management competency -- that ability to manage the people side of change (Creasey, 2018). It is fundamental to state that the existed culture of concentrating on methodologies of organizational improvement were generated from the

philosophy of Total Quality Management (TQM) in the 1970's and 1980's, improved to be the business excellence models so as the continuous improvement was a basic part all the worldwide. Despite emerging a lot of models during 1990's, the Lean Six Sigma methodology was agreed as the most effective improvement methodology among them (Chelliah & Skinner, 2016).

Every framework (e.g., Australian (2011), Baldrige (2015 – USA Based), EFQM (2013, European Based)) has enhanced the developing and implementing the improvement capacity within the businesses. This in turn meant creation and implementation of a model for improvement based on specific works or projects. There was also a lot of organizational improvement approaches emerged as process improvement cases among the organizations that worked on follow ups across the world (Evans and Lindsay, 2014).

Both of Six Sigma and Lean have distinctly reflected the roots of continuous improvement history (Sunder, 2013). Lean Six Sigma and the application of DMAIC as a phased model for guiding improvement project work became de rigueur (fashionable) (Pepper and Spedding, 2010; Snee, 2010; Antony 2011). The popularity of the LSS methodology for development was improved by the board revealing of the advantages of its application especially in financial terms. Antony and Banuelas (2002) stated that 75% of the businesses they targeted in their study had obtained benefits in the order of a more than US \$1 billion. They indicated the effect for Motorola (1987-1994), General Electric (1995-1998) and Allied Signal (1992- 1996). Their study's findings showed that Lean Six Sigma shod the light on financial returns to the organization in the balance sheet. In 1999, more than half a billion that General Electric Company spent on Six Sigma initiatives and gained over US\$ two billion in benefits for the fiscal year (Linderman *et al.* 2002). This concentration on achieving both productivity and financial benefits continued to drive a worldwide interest in the field. It accomplishes both productivity and financial gains constantly followed up to lead the

world which requires enough enthusiasm for strengthen the transition philosophy and change management.

Benchmarking study of Prosci (2014) has shown Best Practices in Change Management with determining specific factors as the most effective enhancements to the efforts of a successful change management as follows:

1. Active and visible executive sponsorship.
2. Structured change management approach.
3. Dedicated change management resources and funding.
4. Frequent and open communication about the change and the need for change.
5. Employee engagement and participation.
6. Engagement and integration with project management.
7. Engagement with support of middle management.

According to (Klabish, 2016) that states "Lean Six Sigma practitioners should get the ability to create a persuasive case for change, gain commitment and cooperation from the organization, influence without power and eliminate resistance". In parallel, there are many organizational change management techniques that ensure a more successful Lean Six Sigma projects, those practices should take into consideration the organizations' culture as follow:

A- Establish a governance structure of Lean Six Sigma project– that means the management is incorporated to the organizations' executive strategy, and middle management are involved in contribution, also the project issues with its opponents are determined and addressed on the highest priorities of the management.

B- Develop a stakeholder management strategy and plan – It is crucial to address the needs of every level in the management and workers appropriately by engaging them in the Lean Six Sigma project to guarantee implementing the project easily. It is important to create a communication management strategy where the regular basis of communications are vital to all stakeholders in the project, and to address the different needs and concerns of executive management, middle management and line workers to get the proper solutions and outcomes of the project. Create a training strategy and plan. To provide developed training packages to the stakeholders based on different needs of the management levels will greatly reduce the organizational resistance and guarantee the success of Lean Six Sigma project. Develop an organizational readiness strategy and plan; when organization is ready to embrace the change that means the organization is completely ready to embracing and succeeding the Lean Six Sigma project without failure.

Chapter 3

Research Methodology

3.1 Introduction

This chapter involved the research types and purposes and concentrating on the research strategy including the two models for improvement methodology; PDSA & DMAIC, since it includes the approach of Plan, Do, Study and Act that linked with the phases of Six Sigma methodology of Define, Measure, Act, Improve, and Control. Also, the chapter sheds light on the data collection tools as well as providing specific clarifications and comprehensive figure by which the two models used with its tools for the improvement work.

3.2 Types of Research

According to the American sociologist Earl Robert Babbie, “Research is a systematic inquiry to describe, explain, predict and control the observed phenomenon. Following are the types of research including: **1- Basic Research:** it is carried out to enhance knowledge. It doesn't have commercial aspects or intend to invent in businesses. It is focused on specific cases like conducting experiment. **2- Applied Research:** it is related to real-life problems analyzed and solved. This type is based on scientific methods and contributes to solve practical problems for humans like finding a specific cure for a disease. **3- Problem Oriented Research:** as the name suggests, this type is for understanding the exact nature of the problem to find out relevant solutions and make decisions. **4- Problem Solving Research:** This type of research is popular in businesses which conducted to prevail the problem reasons and solve them using applied research.

3.3 Purposes of Research

As (Bhat, 2018) states, there are three purposes of research as follow:

1. Explanatory Research: Also known by causal research, which is conducted to realize the influence of specific changes at the current standard procedures; conducting experiments is strongly linked with this purpose.

2. Descriptive Research: it concentrates on data collection process for the current issues, and usually studies the behavior of a sample population.

3. Exploratory Research: this purpose is the most familiar one with this research of Lean Six Sigma to improve the bank account process, since it is the first study in Palestine. Exploratory research usually establishes the basis for more conclusive research and data collection. It is conducted to address new areas of the problem that will be explored for the first time, and never guaranteed to come up with a final conclusion as this improvement work tries to achieve. Table 3.1 shows a comparative analysis to understand the characteristic of research design using research purpose:

Table 3.1: Research Design

	Exploratory Research	Descriptive Research	Explanatory Research
Research approach used	Unstructured	Structured	Highly structured
Research conducted through	Asking research questions	Asking research questions	By using research hypotheses.
When is it conducted?	Early stages of decision making	Later stages of decision making	Later stages of decision making

3.4 Research Strategy

Research strategy characterized as a manner depending on rational procedures aiming at answering the research question.

There are many strategies used by research works such as case study, grounded theory, survey, experiment and so on (Blaikie, 2009). The research strategy is considered as the mixed methods strategy since the documents, interviews and questionnaires are being used for achieving its goals. Basically, the research strategy has been designed according to major two models; DMAIC Model & PDSA Model in parallel with its accompanying tools especially those used in data collection. These aspects are explained as follow:

3.4.1 DMAIC Model:

As defined by Kwak and Anbari (2004), DMAIC is a closed-loop process that eliminates unproductive steps, often focuses on new measurements, and applies technology for continuous improvement. DMAIC is a logical and structured approach to problem solving and improvement process; it is a progressive improvement process and quality tool focus on a change of management style.

This research substantially used DMAIC Model in chapters: 4,5,6,7 and 8 as a framework for the improvement process as the following:

- The **Define** phase in the fourth chapter is the first step in the DMAIC Model. It aims to determine the problem and the objectives, to recognize the existing resources, scope and duration of the project. Moreover, the potential improvement is defined from business and customer perspectives.

- In the fifth chapter, specific tools of the **Measure** phase have been demonstrated to learn more about the process and the current performance to determine the current problem and use it as a ground for improvement.
- The **Analyze** phase covered in chapter 6 aims at determining the key factors or input variables affecting the process outputs as well as defining the root causes of the problem.
- In chapter 7, the **Improve** phase is covered with special focus on the following activities: testing theories, results of testing, prepare the improvement plan and implement solutions.
- The final phase of the DMAIC methodology which is the **Control** phase covered in chapter 8, displays the need to maintain the achieved improvements with monitoring them to minimize defects and standardize any process changes with the most appropriate procedure. Figure 3.1 shows brief clarification of the DMAIC Model:

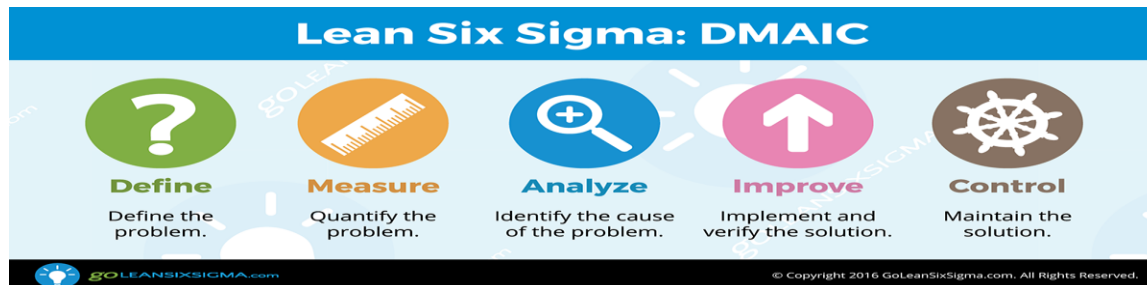


Figure 3.1 DMAIC Model

Goleansixsigma (2018)

3.4.2 PDSA:

The Deming Cycle which ended up known as PDSA cycle is a constant change cycle containing an exact course of stages or steps (Plan, Do, Study and Act). It is a refined device for quality change that can offer structure to the work being performed among every one of the DMAIC

stages. The structured cycle of PDSA is encouraged to be applied in the phases of DMAIC structure (Define- Measure- Analyze- Improve- Control) and to be considered as key role for the undertaking of all cycle dimensions in order to take provoke activities for bringing perpetual upgrades improvements.

As per Sandeep Kumar (2017), there is a comparison among the two models at a glance as follows:

PDSA	DMAIC
<u>PDSA</u> is a general methodology	<u>DMAIC</u> is very specific methodology using statistics to reduce variation
Qualitative approach	Quantitative approach
General guiding principle	Specific problem-solving tool

It is important to mention that DMAIC and PDSA are linked by iterative cycle to improve the process continually. Fundamentally, DMAIC generated from the Six Sigma philosophy and contains the same principle as PDSA but with more focus on gathering the data and analysis regarding the Six Sigma Methodology.

The research utilized PDSA cycle model in an immediate and backhanded way once the majority of the examination parts including DMAIC pass in a complimentary cycle as far as plans for activity, executing, assessing and acting and reusing the examination procedure as required. The two models utilized tools with exhaustive graph will be clarified also in the following section.

3.4.3 Data Collection Tools:

The tools of research process for collecting data were carried out by using each of quantitative and qualitative methods in parallel with using software programs like Minitab and excel analysis of the Project Management Institute (PMI). This in turn has resulted in getting a valued baseline and completed image of the current situation. Moreover, data collection tools have helped in identifying most of the root causes for the long time spent to open a new bank account, and then generating solutions to get the targeted improvement.

Interviews (face to face or through phone calls), intermittent reports assessment in addition to statistical data gathering were considered major tools to get valid information including: statistical data about the new accounts performed, the nature of procedures and responsibilities required by the customer and the Bank, the related feedbacks on the processes either positively or negatively, the international instructions that periodically updated, the value added and wastes in the process with identifying improvement opportunities. Moreover, that information have been utilized in the research process to get accurate facts through effective interaction with key stakeholders of PIB who engaged in the process, including related units' managers as well as customer service officers who are working directly with the customers. Noteworthy, assembled information have formulated the starting point to go ahead to prepare plan for practical steps for improvements.

It is essential to express that the general frame and the approach of information about the used tools were provided by the head of Quality Management program at AAU as component of accomplishing this thesis. In addition, a three-month period was chosen before the improvement work start to act as the standard for past performance. The average of three-month utilization rate for opening new bank accounts acted as the main criterion of the improvement work. This time-frame has been chosen for adjusting the changes in regular events as well as the monetary effects

on economic environment so as the reliability and validity of the research were amazing to achieve the project purposes.

Figure 3.2 shows briefly the research framework including the Lean Six Sigma tools used according to DMAIC & PDSA Models for this improvement work, it is inferred from PMI approach:

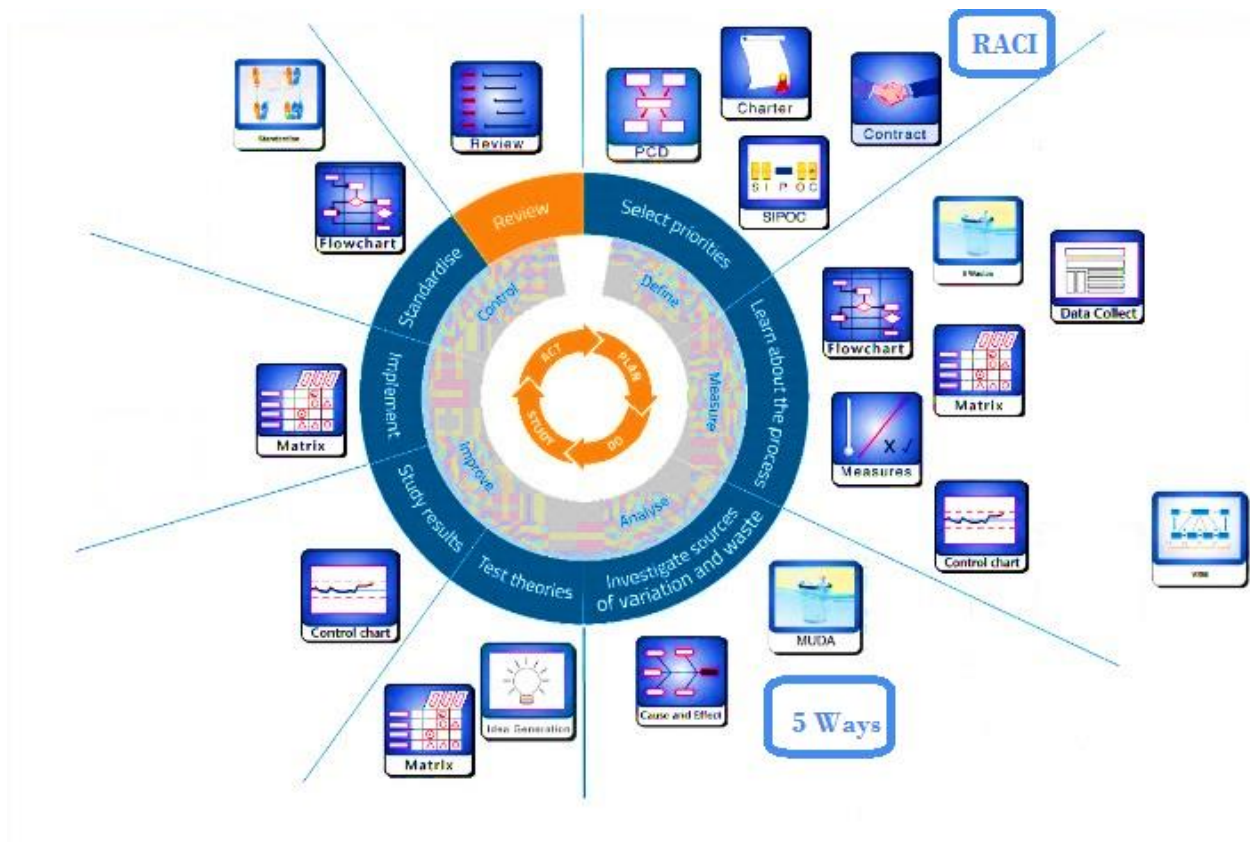


Figure 3.2: Research Framework

In details, the research used specific tools in each phase of DMAIC and PDSA as follows:

- The tools of Project Charter, SIPOC, Team Contract, Problem Context Diagram and the RACI Chart have been used in the **Define** phase of the improvement work as part of **Plan** steps of PDSA.

- Tools including: Flow Chart, Value Stream Map, 8 Wastes, Quick Wins, Voice of Customer (internal & external customers), Voice of Process, Key Measures, Data Collection and Control Charts have been used in the second phase of Six Sigma Methodology that is **Measure** phase, since it is also linked with **Plan** phase to collect the data from the actual side.
- The tools used in the **Analyze** phase are: Cause and Effect Diagram, 5 Whys and Brainstorming. These tools are correlated with **Do** phase of PDSA to identify Root Causes deeply.
- The **Improve** phase is linked with **Study** phase in PDSA, which uses tools related to testing theories, finding the results of testing, preparing the improvement plan also tools related to implementing the solutions from within specific tools like: Matrix Tool, Idea Generation, Control Chart and Flowchart.
- **Control** phase displays the need to maintain the achieved improvements with monitoring them to minimize defects and standardize any process changes with the most appropriate procedure. There are flowchart and standardization tools used in the final phase are linked with **Act** phase in PDSA model.

Chapter 4

Define Phase

4.1 Introduction

The initial phase in DMAIC Model intends to decide the issue and the goals, additionally to perceive the current assets, extension and term of the task. Besides, the potential enhancement is characterized from to business and client points of view. Explicit apparatuses in the Define stage are utilized including: Project Charter, SIPOC, Team Contract, Problem Context Diagram and the RACI Chart. According to Laine (2015), characterizing the problem needs to be identified. Typically, this is done through a formal undertaking choice process where the business firstly distinguishes the zone of its opportunity and a space of change. A project charter, Problem Context Diagram, SIPOC, Team Building, team contract, RACI chart, key measurements and scope are prepared and characterized, also the project plan gets support and endorsement before the project becomes validated, the colleagues are defined and the development work is formally initiated.

Exercises have to be planned according to a business process or value stream and to recognize who are the holders. Recognizing customer needs or "Voice of the Customer", for example, cost, quality or speed. A high-level basis is built up and the practical objectives are set to pointe balance sheet net profits are comprehended and documented.

Define phase requires framing the business problem, here; it can be started with asking three critical questions to get a complete image to pave the way to set an improvement plan. The questions and the detailed clarifications are as follows:

- 1- What are we attempting to achieve?

The underlying objective ought to be short, obvious and accurate and ready to manage the change exertion, and to determine the potential outcomes. However, there is no need to characterize the objective clearly at this phase, it might be possible to determine the issue or an improvement case, the development target work and why is it essential to the business by linking it to the general goals. The important point is to capture the general image, expected benefits and the impact on the customers.

2- How will we realize that the change is really a change for improvement?

What is thought of the issue at this phase, past execution or the standard to start from? How have the past results been and what are the targeted results? How might one recognize this and being aware of specific indicators toward evaluating the achieved progressions? Here there is a need to set a plan to collect the data required.

3- What improvement steps would be able to make such a proof of change?

A significant checking for vacillation in the process came about because of substantial assets or human bungle could be valued. Would one have the capacity to address any of the factors that fast these goofs or impact the methodology with the change attempts? Perceiving and positioning key reasons and the key execution pointers, and setting the underlying changes plan and to actualize the required enhancements.

Accordingly, there are three categories of improvement:

- Disposal of quality issues that happened due not to meeting the customer's expectations.
- Come up with radical cost decrease in parallel with keeping quality development process.

- Working on bringing the customer's unexpected desires through designing untraditional and valuable products and services.

The define tools used in the research as mentioned in the introduction are as follow:

4.2 Project Charter

The Project Charter is considered as the target explanation of the improvement work that incorporates objectives, jobs and obligations, point by point at the dimension of the staff appointed to deal with the advancement work. The record is a recommendation that draws the targets, the normal deterrents, and proposes explicit answers for the concerned issues. Consequently, this vital apparatus brings productive outcomes, for example, creating reasonable correspondence channels, getting a sponsorship for the advancement work, distinguishing the jobs of best administration, and taking into account benchmarking for upgrades. At the end, the undertaking contract is viewed as in excess of a basic instrument because of the critical components it contains.

Briefly, as per Laine (2015), the Project Charter includes the following elements:

1. Problem Statement;
2. Project objective or purpose includes the business need;
3. Scope;
4. Deliverables (objective measures of success that will be used to evaluate the effectiveness of the proposed changes);
5. Sponsor and stakeholder groups;
6. Team members;

7. Project schedule;

8. Other resources required;

The following table clarifies in details how the project charter plays a major role regarding the mentioned points and other aspects to improve the bank account opening process at Palestine Islamic Bank:

Table 4.1: Project Charter

Project Leader	Bara' Refai
Project Title:	Improving the bank account opening process using Lean Six Sigma Methodology at Palestine Islamic Bank.
1. Purpose:	
The aim is to reduce the time it takes to open a new bank account by at least 20%.	
2. Business Case:	
<p>This project was initiated to address the problem of long process in terms of steps and time that the customers face in opening new bank accounts. One of the items on the business balanced scorecard for PIB is to improve this process performance. With the current process, some customers complain about the duration of the process, and some customers withdraw without opening an account...</p> <p>Following the completion of development plan, the duration to open a new account will be shortened, which results in higher productivity and better customer satisfaction.</p>	

Key Players:	Scope:
Sponsor: Mr. Imad Al-Sadi	The project will cover 37 branches of Palestine Islamic Bank in the West Bank and Gaza Strip with concentrating on customer service divisions, as well as department's procedures, central operations, product and programs development, AML and compliance in the head office.
Team Members: Mr. Bara' Refai, Mr. Asem Al-Masri, Mr. Mahdi Al-Refai and Mrs. Jamila Rajabi	

Enablers/Risk Mitigation	Barriers/ Risks
<ol style="list-style-type: none"> 1. Accurate software programs. 2. Professional central departments. 3. Well trained and cooperative staff. 4. Inclusive and simplified instructions. 5. Appropriate work environment for improving the current procedures. 	<ol style="list-style-type: none"> 1. Official bodies instructions that conflict with some improvement recommendations. 2. Non-alignment of the "Banks" system with many improvement recommendations. 3. The difficulty to track all bank account opening processes at the branches. 4. Busy employees with crowd of customers that result in: <ul style="list-style-type: none"> • Less accurate data provided by customer service officers. • Lack of customer response to get his/ her feedback about the process.

Support Estimates:
Estimate of the staff, equipment, expertise, and capital required for the development plan:
<ol style="list-style-type: none"> 1. The project is expected to cover 50 employees at the bank headquarter and the branches. 2. The current software programs include "Banks" system, Safe Watch and PMA system. 3. The expertise includes heads of the customer service sections and supervisors at the branches, department manager of the work procedures, department manager of products and programs development. 4. The estimated duration of project is 7 months.

An additional dynamic tool used in the define phase is discussed below.

4.3 Problem Context Diagram (PCD)

The PCD is used to establish the context and boundaries of the problem to be modeled, this tool includes internal and external factors of the concerned service or product, as well as it identifies the linkage among the current procedures in the process. Usually, 20% out of the input processes contribute to 80% of the problem identified.

Figure 4.1 shows the PCD for the process to be improved:

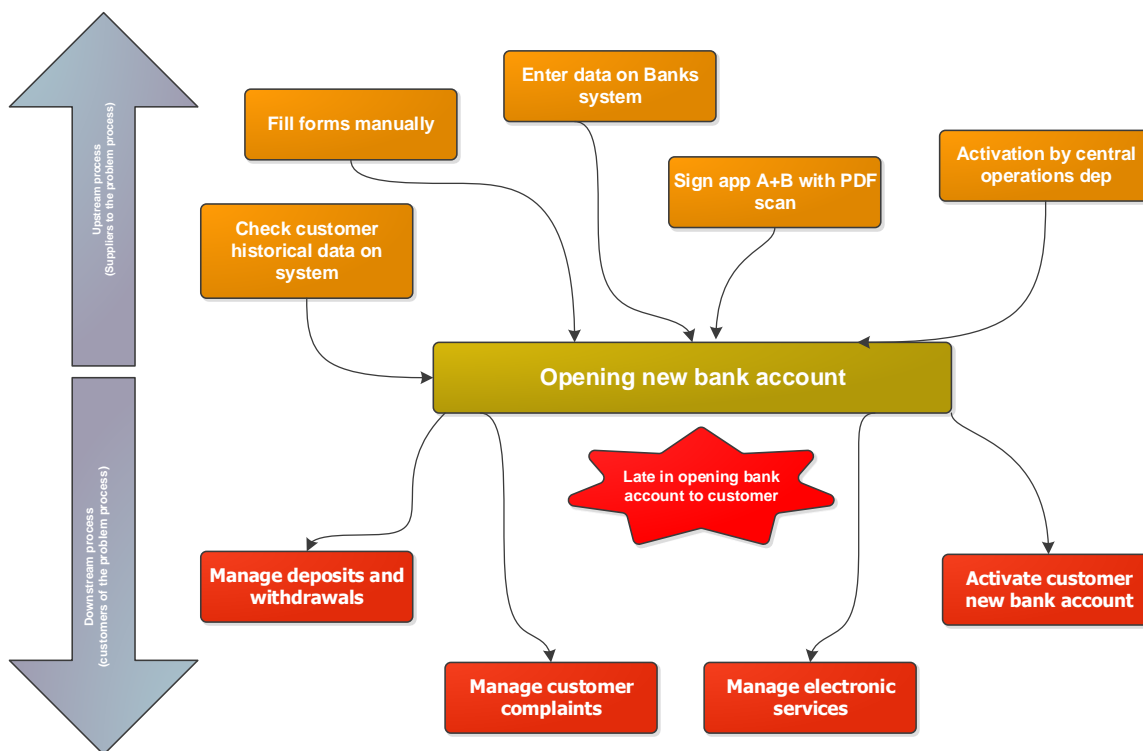


Figure 4.1: Problem Context Diagram

It is important to mention that the two steps of “filling forms manually” and “activation by central operations department” form 65% of the time spent in the process of opening the bank account. Hence, these two processes should be the essence of the improvement efforts.

4.4 SIPOC

SIPOC is a tool which clarifies the inputs and the outputs of the process briefly by using a specific form containing suppliers, inputs, process, outputs, and customers. This important tool has emerged in parallel with TQM programs in the late 1980s, and it is used to prioritize the customers' needs, and currently it is used enormously in Lean & Six Sigma (Radziwill, 2011).

The elements of SIPOC are clearly defined as follows:

- 1- **Suppliers** –External or internal parties of the process.
- 2- **Inputs** – All the key inputs to the process like manpower and systems.
- 3- **Process** –Representing the entire flow of the process from the beginning to the end.
- 4- **Outputs** – The outputs of the process which are taken by the customers such as, debit card and bank account.
- 5- **Customers** –The customers who receive the output of the process whether internal or external ones.

The SIPOC in Table 4.2 is for the process of opening new bank account.

Table 4.2: SIPOC for the process of opening a new bank account

Key Business Process Name: Bank account opening process.									
Suppliers		Input		Process		Output		Customers	
<ul style="list-style-type: none"> - Customer service officer - Head of customer service - Deputy and Branch manager - Head and employees of accounts opening division at operations department - In some cases: AML, Compliance, legal departments and deputy GM 		<ul style="list-style-type: none"> - Manpower - Software programs - Documents - Banking systems - Forms 		<ul style="list-style-type: none"> - Process Purpose: aims to open new bank account with high quality and shortest time. - Process Owner: Customer service officer 		<ul style="list-style-type: none"> - Opening new bank account to the customer. - Bank account card. 		Palestine Islamic Bank customers that include: <ul style="list-style-type: none"> - Companies. - Individuals. - Society institutions... etc. 	
Process Steps (High Level)	Check customer historical data on system	Getting the required documents	Management approval as per validity matrix	Customer signing on the forms	Data entry through Opening ledgers on "banks"	Auditing the customer profile	Central Operation department approval	Results Measures	Customer Needs
	Accuracy of checking process/ Time to complete the task	Time taken to collect the documents	Time taken to approve by the related units	Time spent to read and sign all needed forms	Time taken in inserting data and creating ledgers in the banks system	Time taken to check and verify all customer related files	Time taken to final approval on opening account		
Present Data	85% is accurate and on time	Within 10 minutes	Within 24 workhours at max	Within 15 minutes	Within 10 minutes	Within 12 minutes	Within 10 minutes		
Goal Performance	100% accurate checking	Within 1 minute	Within 5 minutes	Within 2 minutes	Within 2 minutes	Within 2 minutes	Within 1 minutes	Results Concerns 10% of the accounts opening orders are rejected	Date 20-08-2018
Sources of Variation & Waste	- Slow system -Unprofessional employee	Delays from the customer to bring the documents	Disabling manager due to work pressure	Slow read with a lot of information	Officer work pressure	Incomplete requirements	Work pressure and busy employee	Customer discontents for waiting time spent to get management approval	Version
Impact on Performance	Lack of accuracy in query process with long time	Delay to get the documents	Customer discontent and late for the next step	Long spent time	Delay of completing the process	Delay of verifying the process	Delay in opening bank account	15% of the accounts opening orders are reserved and rejected	

4.5 Team Contract

The improvement team is formed of the staffs working specifically in the process. A team contract is an agreement between the project manager and the team members to operate and commit to the set plan. The contract table is considered as agreed upon tool that includes definition of all key elements related to the project and the team members as follows: project sponsor, team leader,

project title, date, issue, project purpose, business case, key players, scope, milestones (process, steps and duration), enablers, barriers and support estimates.

Table 4.3 shows the team contract:

Table 4.3: Team Contract

Project Sponsor	Mr. Imad Al-Sadi	
Team Leader	Mr. Bara' Al-Refai	
Project Title	Improving the bank account opening process using Lean Six Sigma Methodology at PIB.	
Date	21.01.2018	
Issue	30.08.2018	
3. Project Purpose (Objectives)		
The aim is to reduce the time it takes to open a new bank account by at least 20%.		
4. Business Case (Issues to be addressed/process to be improved)		
The development work was initiated to address the problem of long steps and time the customers face in opening new bank accounts. One of the items on the business balanced scorecard for PIB is to improve this process performance. With the current process to open a new account, some customers complain about the duration of the process and some customers withdraw or refrain to open accounts. Following the completion of this development plan, the duration to open a new account will be shortened, which means higher productivity and better customers' satisfaction.		
Key Players		Scope
Sponsor	Mr. Imad Al-Sadi	The project will cover 37 branches of Palestine Islamic Bank in the West Bank and Gaza Strip with concentrating on customer service divisions, as well as departments of procedures, central operations, anti-money laundering and compliance in the Head Office.
Team Leader	Mr. Bara' Al-Refai	
Team Members	Mr. Asem Al-Masri Mr. Mahdi Al-Refai, Mrs. Jamila Rajabi	

Other Key Staff	Related units' managers in some way.	Out of scope: the project will not fix the other banking services like ATM, Financings ...etc.
Milestones (The major indicators of team progress and triggers for the review process)		
Process Step		Duration
<ul style="list-style-type: none"> Defining the basic problems in bank account opening process based on the facts and “as is” situation. 		20. Jan — 21. Feb
<ul style="list-style-type: none"> Investigate the sources of variation and waste in bank account opening process. 		23. Feb – 21 March
<ul style="list-style-type: none"> Introducing most practical solutions based on Lean Six Sigma. 		24. March – 19 May
<ul style="list-style-type: none"> Keeping implementable improvements in the process. 		20. May – 16 Aug
Enablers/ Risk Mitigation		Barriers/ Risks
<ol style="list-style-type: none"> Accurate software programs. Professional central departments. Understandable and cooperative staff. Inclusive and simplified instructions. Well trained and skilled employees. Appropriate work environment for improving the current procedures. 		<ol style="list-style-type: none"> Official bodies instructions that conflict with some improvement recommendations. Non-alignment the “Banks” system with many improvement recommendations. The difficulty to track all bank account opening processes at the branches. Busy employees with crowd of customers which result in: <ul style="list-style-type: none"> No accurate data provided by customer service officers.

	<ul style="list-style-type: none"> Lack of customer response to get his/ her feedback about the process.
<p>Support Estimates</p> <p>Estimate of the staff, equipment, expertise, and capital required for the project.</p>	
<ol style="list-style-type: none"> The project will cover 50 employees at the branches and bank headquarters. The current software programs include “Banks” system, Safe Watch and PMA system. The expertise includes heads of the customer service sections at the branches, SOP’s department manager, products and programs development department manager, and central operations department manager. The development work needs 7 months to be implemented. 	

4.6 RACI Chart

This tool describes the engagement of different roles in accomplishing tasks in the project. It is especially useful in clarifying roles and responsibilities in cross-functional departments and processes. The acronym RACI is derived from the four key levels of responsibilities used: Responsible, Accountable, Consulted, and Informed.

As per the current standards of procedures of bank account opening process at Palestine Islamic Bank, the Table 4.4 shows the RACI tool describing the steps accomplished with employees’ participation. Procedures contain R & A of the a new bank account opening process according to the RACI tool, where the role of customer service officer (R) follows the opening process from the first step to the final step as he/ she is the core point and accomplishes many functions crossing with roles of the other employees as following:

Table 4.4: RACI Chart

RACI	Procedure	Required by	#
R	<ul style="list-style-type: none"> • Welcoming the person and defining the nature of his/her work. • Checking customer historical data according to the banking system using the personal identification number and verification name to determine whether he/ she has an account, then the employee hands the customer an account card , or proceed with the other procedure if there is an account existed, he/ she is given his/ her account card number. • The potential customer signs on the authorization form of checking his/ her historical data. • Checking customer historical data through the safe watch system, the apology will be demonstrated if the customer's name appears in the inquiry results; otherwise to follow the normal procedures if not. • Checking customer's classification to the PMA system and print the results, to be displayed to the branch manager before proceeding to open the account, in case the inquiry result is not satisfactory, then proceed with the next steps. • Obtaining the required documents from the customer. • Getting the necessary approvals to establish professional relationship or open the account according to the matrix of authorization, in case of refusal by the authorized parties, then an apology should be presented to the customer. • Selecting the account type to identify the required documents to be provided according to the account opening file. • Printing checklist of needed documents to open an account by using internal staff network. "List of documents required to open the account according to the account type ". • Consulting the legal department in cases necessary for legal documents required to be checked and approved to open the account, this includes certificates issued by companies monitoring 	Customer service officer	1

	<p>unit, the establishment contracts, the cases of custody and the attorney and others r according to the concerned case .</p> <ul style="list-style-type: none"> • Filling the account opening form and making sure that the customer signed all required forms to be approved by the Bank. • Asking the customer to sign on the signature card (part of the account opening form requirements) to be entered in the system. • Asking the customer who has the US citizenship indicators to sign on the forms of the US tax law according to the FATCA Approved Policies. • Asking the customer who does not have US citizenship to sign on the annexes of the pledge of the requirements of US citizenship in case she/he subsequently will hold it. • Asking the customer to sign the data update form according to customer classification. • Ensuring that all the required fields are filled in the whole forms. • Matching signatures on all forms. • Stamping the papers with a stamp of a replica. • Signing the check list paper to ensure all required documents are completed. • Login to the banking system and filling all screen fields of “adding initial customer” to determine company shareholders who own at least 10% of the company's capital. • Entering the customer's data in the initial customer screen and link it with the existing account. • Accessing to the banking system and fill all the fields of adding a new customer, considering the comprehensive and accurate data inputs. • Recording the customer account number showed on the bank system and writing it on the customer account card with a statement of account type. 		
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	<ul style="list-style-type: none"> • Passing the transaction file to the direct administrator (head of customer service and branch deputy manager) including all documents to open the account as well as inquiry results. 		
R	<ul style="list-style-type: none"> • Receiving the transaction and reviewing and verifying the transaction documents. • Making sure that the customer's signature is provided on the required forms. • Signing check list paper and making sure all the required documents are completed. • Checking data provided with transaction data. • Reviewing, auditing and signing the completed transaction. 	Head of customer service and branch deputy manager.	2
R	<ul style="list-style-type: none"> • Sending the transaction by e-mail to the central operations department (accounts opening section). • Uploading customer signatures to the banking system. 	Customer Service Officer.	3
R	<ul style="list-style-type: none"> • Receiving account opening transactions from branches by e-mail. • Checking customer's transactions and making sure that all the documents mentioned in the check list are available with the needed authentications. • Ensuring the availability of annexes to pledges of US citizenship are complied, if not, the transaction shall be apologized and the branch being notified accordingly. • If lack of documents appears, the concerned branch will provide the required documents to be kept in department till the necessary documents accomplished. • In case the branch does not provide the needed documents during one working day, the transaction returned to the branch to explain the reasons of delay. 	Head of accounts opening section, central operations department.	4

	<ul style="list-style-type: none"> • Ensuring that the branch added customer classification to the banking system according to the degree of risk. • Transferring the completed transaction to the accounts opening officer to complete the remainder procedures. 		
R	<ul style="list-style-type: none"> • Receiving the transaction from the head of accounts opening section. • Accessing banking system and opening serial numbers of the account according to the transaction data. • Delivering transaction to the head of accounts opening section in the central operations department. 	Account opening officer/ central operations department.	5
A	<ul style="list-style-type: none"> • Ensuring that all data are entered in the required fields in the system. • Signing the transaction after its auditing and reviewing. • Asking the concerned branch to complete the next procedures. 	Head of accounts opening section, central operations department	6
R	<ul style="list-style-type: none"> • Entering the signatures to the banking system as appropriate. • Signing the transaction and passing it to the head of customer service. 	Customer service officer.	7
A	<ul style="list-style-type: none"> • Receiving the customer's transaction and entering its data to the banking system and then accrediting the signature. • Convert customer's transaction to the customer service officer for keeping. 	Head of customer service	8
R	<ul style="list-style-type: none"> • Receiving the customer's transaction and making sure that all the necessary documents are provided with reviewing the check list. • Saving the transaction by branch and the setting number of the new account in the right place of the branch. 	Customer service officer	9

Chapter 5

Measure Phase

5.1 Introduction

According to Selvi and Majumdar (2014), the measurement evaluates the process performance as the tasks are carried out as follows:

- Performance standards are defined, which means setting specification limits that meet the customer needs.
- Develop data collection plan and collect the data.
- Validating the measurement system.

In this chapter, specific tools of the Measure Phase of LSS have been demonstrated to allow the process and the current performance to determine the current problem and use it as a ground for improvement. Tools used include: Flow Chart, Value Stream Map, 8 Wastes, Quick Wins, Voice of Customer (internal& external customers), Voice of Process, key measures, and Control Charts.

Laine study (2015) states that in this stage, it is determined what should be estimated in the considered task. A measure being a studied assessment or real execution to discernible information, for example, time, number of defaults, deals or specific segmentations, like male and female classification or kind of customer with the job and considering the individual and company category. Moreover, considerable information gathered for having the capacity to measure a standard process performance. Baseline data are additionally used to decide if any change has occurred at the final stage of the improvement process.

In general, the Measure Phase passes through 4 steps as follows:

1. Determine what to measure.
2. Manage measurement data collection.
3. Develop and validate measurement systems and
4. Determine sigma performance.

The high-level tools used in the Measure Phase are as follow:

5.2 Flow Chart

Flowchart the procedure alludes to setting a progression of undertakings into coherent course of action utilizing particular arrangement of symbols. It tends to be utilized to give helpful hand in finding and wiping out blunders in a given procedure and additionally where (and how) to discover the holes between vital objectives and current process (Ensmenger, 2016).

Figure 5.1 shows the Flowchart of the bank account opening process at Palestine Islamic Bank followed by explanation:

Flow Chart for Bank account opening process at PIB

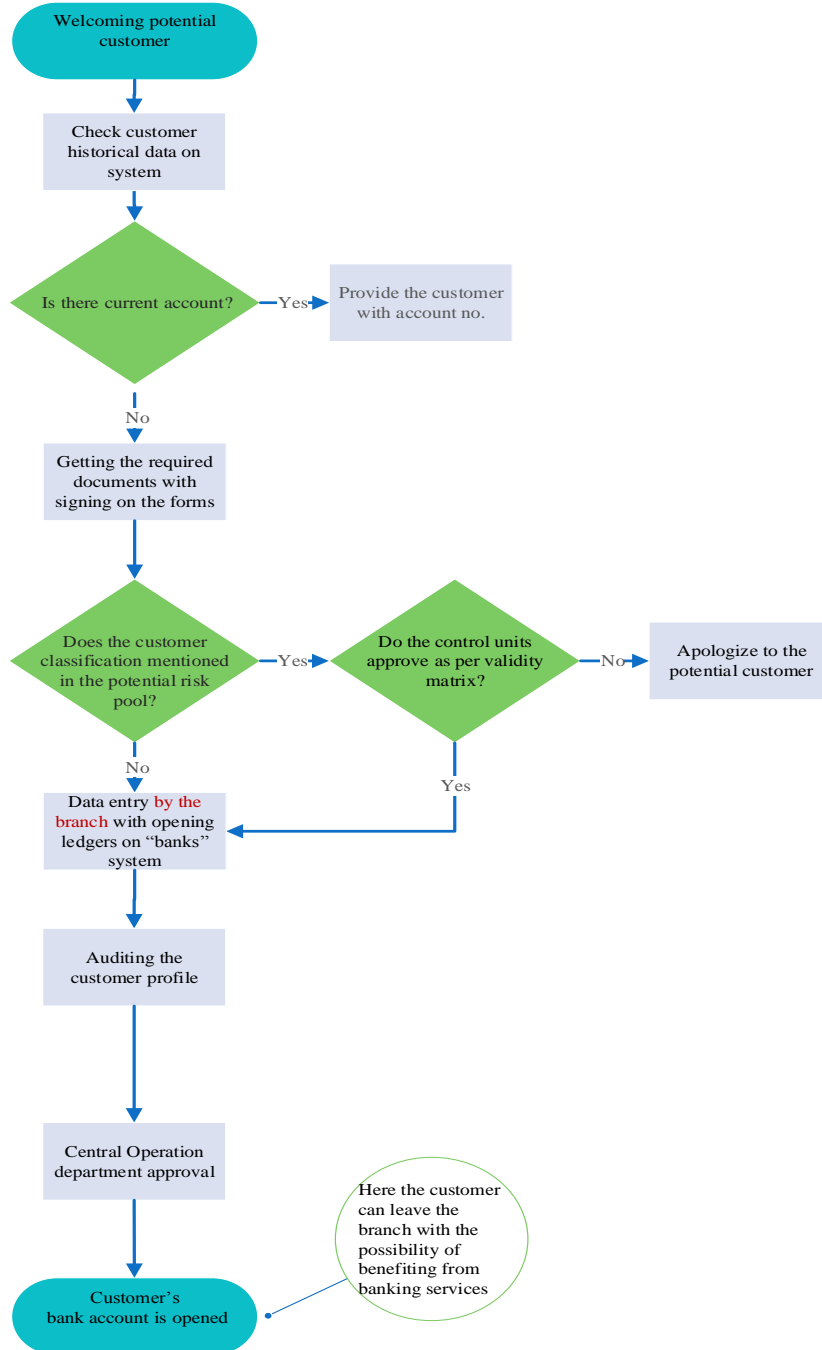


Figure 5.1: Flow Chart

Below, a considerable explanation of the steps accomplished by the back offices for opening new bank account after the branch sends the application to the related departments:

1. After receiving the completed application from the branch by email, and reflecting the data on the system, operation team is required to act as maker and checker, here either:
 - Reject, terminate the application;
 - Ask for additional information/documentation;
 - Approve
2. After temporary account is created, initial account deposit (one-time deposit) to be an optional step (e.g. high-risk customers should not be able to make deposit).
3. KYC Review: Once application entry finished at branch, then application should go automatically to AML, and Compliance, for customers whose risk categorization value is high risk as maker & checker, and in this step, it is required to have the ability to upload documents if needed. (Document upload is to allow compliance and AML to work together on the screen).
4. Top management checker after AML recommendation. If the application is rejected from AML or Compliance, then apologize for the customer and terminate the process. If accepted then deep application enrichment to take place, signature capture, image plus 360 information about the customer, and account classification need to be moved again to "Regular classification" instead of "Temporary", this is to be done automatically and all restrains on the account will be removed.
5. For the corporate accounts, it is required to have the ability to carry out legal verification process over the system, if legal advice is required, then it can be made manually and there

should be an option to choose Legal department to be a checker to review and validate, and then approve.

6. A report is required to list all customers rejected due to internal/external blacklist in lead generation screen.
7. If the customer brings USD cash to deposit in ILS account, this should be a single operation for the end user and financial transactions.
8. In account creation - welcome Kit: it is needed to add step for debit card request and to be mandatory for retail current accounts whose owners are not special need as per the instructions of Palestine Monetary Authority (PMA).
9. On the system, mandatory means that customer service will be enforced to add card number in the application, the application should automatically validate the card number in the card issuing system.
10. For data cleansing, to put a periodic alarm that customer X has to review his/ her data. (Cleansing is updating the customer's information, and it is compulsory by PMA).
11. Accounts that didn't undergo a complete review of customer info (data cleansing) after predefine period should be blocked automatically. Unblock is done at central operations. For example: if the customer did not update his/ her information for X years (even if bank contacted him many times) then the account will be blocked automatically. These "X" years are a parameter that is different between retail (each two years) and corporate (Yearly).

In addition, below are specific clarifications in case the customer wants to open another new bank account:

If the customer has opened current account for example, and needs to open saving account in the same visit, then he/ she is required to fill in and sign the form of saving account opening without filling new account form or any other forms. If the customer has already current account and needs to open another account like company account or account related to Al-Qaser (underage child) to be the moderator on, then he/ she/ is required to follows each step in the process as mentioned in RACI chart for what related to the manual forms and documents. However, for the requirements related to the banking system, there is a feature that the current account number will be linked automatically with the new process of opening a new account; which means that the information gathering process by using the Know Your Customer (KYC) form is already provided and the customer data entry are being generated from the system. Only in the common account case, the customer is required to follow every step in the process including the manual forms and the soft aspects related to the banking system although he/ she already has account.

5.3 Value Stream Map (VSM)

VSM is considered as one of the most important lean tools derived from” Just in Time” that plays an important role in improving processes and keeping continuous improvements in parallel with eliminating the wastes (Pepper and Spedding, 2010). In the project case, VSM has proofed its unique benefits in spotting the light on the value-added and non-value-added activities including their time conducted during the bank account opening process to apply practical steps in the improvement process.

Figure 5.2 represents the current process of bank account opening including 5 key steps where total time to accomplish the process was 38 minutes according to Al-Bireh branch data table will be demonstrated after the Figure and analyzed in this chapter:

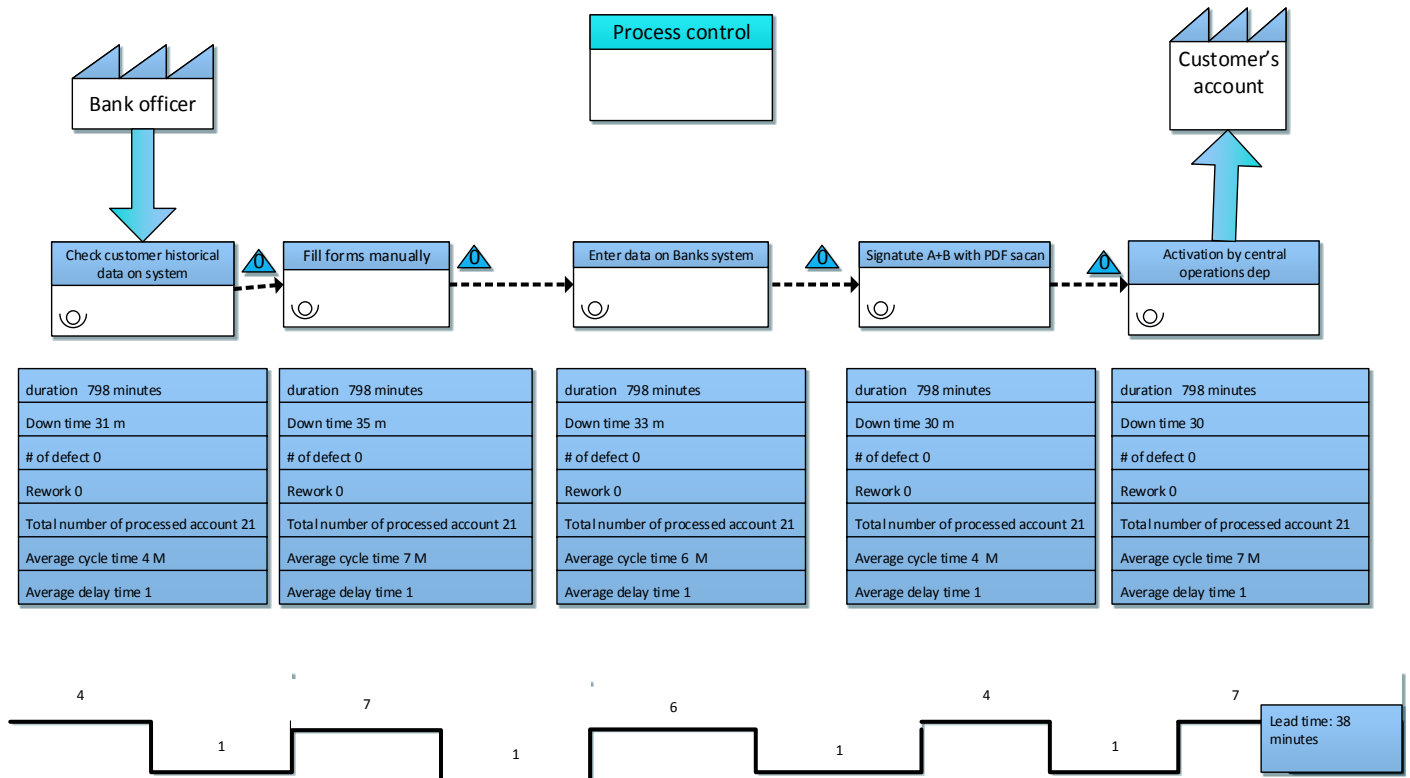


Figure 5.2: Value Stream Map

Table 5.1 shows accounts sample of Al-Bireh Branch related to the previous VSM, and this table will be highlighted and analyzed later on.

Table 5.1: Accounts Sample of Al-Bireh Branch

No.	Check customer historical data on system	Cutoff	Fill forms manually	Cutoff	Enter data on Banks system	Cutoff	Sign app A+B with PDF scan	Cutoff	Activation by central operations dep	Total minutes
1	5		6		8		5		9	40
	10:27-10:32	2	10:34-10:40	1	10:41-10:49	2	10:51-10:56	2	10:58-11:07	
2	8		7		6		3		12	45
	2:00-2:08	3	2:11-2:18	2	2:20-2:26	2	2:28-2:31	2	2:33-2:45	
3	4		6		4		4		8	30
	9:05-9:09	1	9:10-9:16	1	9:17-9:21	1	9:22-9:26	1	9:27-9:35	
4	3		6		8		3		7	31
	1:11-1:14	1	1:15-1:21	1	1:22-1:30	1	1:31-1:34	1	1:35-1:42	
5	4		7		7		3		9	35
	11:14-11:18	1	11:19-11:26	1	11:27-11:34	2	11:36-11:39	1	11:40-11:49	
6	4		5		5		3		4	25
	12:05-12:09	1	12:10-12:15	1	12:16-12:21	1	12:22-12:25	1	12:26-12:30	
7	8		11		9		9		9	59
	10:07-10:15	4	10:19-10:30	3	10:33-10:42	3	10:45-10:54	3	10:57-11:06	
8	5		8		6		4		5	35
	9:30-9:35	2	9:37-9:45	2	9:47-9:53	2	9:55-9:59	1	10:00-10:05	
9	4		8		4		4		8	32
	10:57-11:01	1	11:02-11:10	1	11:11-11:15	1	11:16-11:20	1	11:21-11:29	
10	3		5		8		4		6	31
	8:55-8:58	2	9:00-9:05	1	9:06-9:14	1	9:15-9:19	1	9:20-9:26	
11	6		6		8		5		7	39
	1:37-1:43	1	1:44-1:50	2	1:52-2:00	2	2:02-2:07	2	2:09-2:16	
12	4		6		5		7		6	34
	9:15-9:19	1	9:20-9:26	2	9:28-9:33	2	9:35-9:42	1	9:43-9:46	
13	7		6		7		6		5	35
	2:08-2:15	1	2:16-2:22	1	2:23-2:30	1	2:31-2:37	1	2:38-2:43	
14	5		6		7		6		5	32
	12:11-12:16	1	12:17-12:23	1	12:24-12:31	1	12:32-12:38	1	12:39-12:44	
15	6		11		6		5		10	43
	1:03-1:9	1	1:10-1:21	1	1:22-1:28	2	1:30-1:35	1	1:36-1:46	
16	3		7		5		4		9	36
	9:16-9:19	1	9:20-9:27	2	9:29-9:34	2	9:36-9:40	3	9:43-9:52	
17	5		8		7		5		13	46
	8:39-8:44	1	8:45-8:53	3	8:56-9:03	2	9:05-9:11	2	9:13-9:26	
18	7		7		9		6		15	50
	1:14-1:21	2	1:23-1:30	2	1:32-1:41	1	1:42-1:48	1	2:03-2:18	
19	5		8		5		4		8	35
	12:09-12:14	1	12:15-12:23	2	12:25-12:32	1	12:33-12:37	1	12:38-12:46	
20	4		7		5		7		13	43
	9:48-9:52	2	9:54-10:01	1	10:02-10:07	1	10:08-10:15	1	10:16-10:29	
21	3		6		7		6		11	42
	1:02-1:05	1	1:06-1:12	4	1:16-1:23	2	1:25-1:31	2	1:33-1:44	
		31		35		33		30		798

5.4 8 Wastes

This Lean tool contributes in defining and eliminating “Non-Value-Adding” activities in the process to provide a perfect product and service to the customer. The 8 wastes are gathered in a symbol "DOWNTIME" that includes: Defects, Over-Production, Waiting, Non-Utilized Talent, Transportation, Inventory, Motion, and Excessive-Processing.

The two tables below show key wastes in bank account opening process and help to define solutions to improve the process:

Table 5.2: 8 Wastes Matrix

Workflow			DOWNTIME							
Step	Activities	Executed by	Defect	Over-production	Waiting	Non Utilised Talents	Transport	Inventory	Motion	Excessive Processing
1	Check customer historical data on system	Customer service officer								
2	Getting the required documents	Customer service officer								
3	Management approval as per validity matrix	AML/ Compliance/ Deputy GM								
4	Customer signing on the forms	The customer								
5	Data entry with Opening ledgers on "banks" system	Operations dep. officer								
6	Auditing the customer profile	Head of accounts opening/ operations dep								
7	Central Operation department approval	Head of accounts opening/ operations dep								

Table 5.3: 8 Wastes Table

<i>#</i>	<i>Activity</i>	<i>8 Wastes</i>	<i>Definition</i>
1	Check customer historical data on system	Defect	Query process is not accurate
2	Getting the required documents	Waiting	Long time to get documents
3	Management approval as per validity matrix (for some cases)	Waiting	Long time for multiple approvals
4	Customer signing on the forms	Excessive- processing	Too much signatures by the customer
5	Data entry through opening ledgers on “banks” system	Waiting	Work pressure and busy employee
6	Auditing the customer profile	Defects	Incomplete application as per requirements
7	Central Operation department approval	Waiting	Waiting for approval

It is noted that half of the mentioned wastes in the activities related to problem of "Waiting" which is strongly familiar with the major case in the improvement project of decreasing the time.

5.5 Quick Wins

“Quick Wins” opportunities are identified to mainly address some of the 8 wastes by following specific guidelines as follow:

1. Cope with the criteria of a quick win.
2. Generate potential solutions for each quality concern.

3. Construct a matrix with the potential solutions as rows and the criteria as columns.
4. for each ask “Does this potential solution meet this criterion?” If yes place a tick in the box.

The Table 5.4 shows quick wins for the improvement project:

Table 5.4: Quick Wins Template

#	<i>Quality Concern / 8 wastes</i>	<i>Potential Solution (Quick Win)</i>	<i>Take less 1 week</i>	<i>Costs less than 1000 US \$</i>	<i>Is reversi ble</i>	<i>Within Team's scope to authorize</i>
1	Query process is not accurate	Upgrading and monitoring software programs	No	Yes	Yes	No
2	Long time to get documents	Employees are fully trained	Yes	Yes	Yes	Yes
3	Long time for multiple approvals	Minimizing the multi-approvals	Yes	Yes	Yes	No
4	Too much signatures by the customer	One signature on the list of needed forms	No	Yes	Yes	No
5	Work pressure and busy employee	Assign enough employees to meet the applications	No	Yes	Yes	Yes
6	Incomplete application as per requirements	Customer service officer is aware about the requirements	Yes	Yes	Yes	Yes
7	Waiting for approval	Distributing the work to relieve the pressure	Yes	Yes	Yes	Yes

Accordingly, each potential solution is selected under specific conditions as follows:

- 1- Upgrading and monitoring software programs:

It is known that any defects or shortages in the software programs mostly need considerable revision to take the appropriate actions. When the query process about the customer transactions data is not accurate due to process slowness or errors in the processing that will affect badly on the customer reputation, then the software programs should be upgraded or even replaced and monitored periodically.

2- Employees are fully trained:

This potential solution is correlated with the adequate knowledge about the customers' documents needed to ask for the right docs to avoid time waste and customers' multi visits to provide the needed documents.

3- Minimizing the Multi-Approvals:

According to the approval matrix, there are gradual approvals needed according the customer classification. Here, it is recommended that to cancel the excessive approvals that ad no value to the process.

4- One signature on the list of needed forms:

This suggested solution may minimize the multi-times signatures from 16 to 1 signature on one paper list especially that most of the customer don't read any of the conditions or instructions, but this proposition cannot be worked due to the PMA instructions.

5- Assign enough employees to meet the applications:

It is obvious that specific branches need to restructuring and rotation among the employees and their roles or need to hire enough ones to distribute the work pressure in the daily work.

- 6- Customer service officer is aware about the requirements:

The same to suggestion No. 2 but this linked with the internal units that ask for technical information and the officer should be knowledgeable enough to meet the requirements.

- 7- Distributing the work to relieve the pressure:

It is closer to solution No. 5 in terms of making the appropriate arrangements among the employees according to their abilities and professionalism to balance the work and to serve the customer in a high quality manner.

5.6 Voice of Customer

The VOC is considered to be the most prominent tools of Six Sigma to measure specific aspects of the processes, as well as to recognize the critical values to focus on, and to guarantee high quality in the products and services. In this improvement project, customers are divided into external and internal to be interviewed for getting their various perspectives about the bank account opening process as follows:

5.6.1 External Customers

During the first half of May 2018, face to face, telephone and e-mail interviews were conducted in a sample of ten of bank's customers and selected randomly from four branches (Wadi Al-Toffah, Gaza, Al-Masyoun, and Tulkarm); these customers have recently opened bank accounts and being involved in meetings to get feedbacks upon their experience in bank account opening process. The parts of discussions moved around different issues either in specialized or conduct fields such as: communication skills, providing the service on time, employee's knowledge.

Digging deeper into the analysis of the interviews' feedbacks thematically in parallel with the mentioned aspects of the interviews, the general reflection were good to a considerable level regarding to the following aspects: staff listening to the customer, staff polite with customer, staff knowledge of the service requirements, easy to open account, the comfortability during opening the account, the time spent in opening the account, staff friendliness during opening the Bank account and visit impression to the Bank.

In other meaning, it can be found that the customers are generally satisfied toward the service of bank account opening process, regarding the aspects related to Lean Six Sigma philosophy, and the Quality Management approach. Nevertheless, the employee's knowledge of the requirements of opening the account is advised to be fully enhanced, such as dealing with the US passport's holders due to the special procedures and time required as per the internal procedures of the Bank, as well as signing a lot of forms comparing with other categories of customers which cause disruption and discontent of the customer. In addition, there is a need of providing more effective banking system to ensure a distinctive service to the customers, working to monitor the employees' behavior and how they deal with customers, providing them with desired training in a perfect discipline through the interaction with the customers and setting controls for what is allowed to occur in front of customers to guarantee a high service quality in the PIB's services especially the bank account opening service.

5.6.2 Internal Customers

During April 2018, face-to-face interviews and telephone interviews were conducted with sample of nine interviewees including: branch managers, deputy branch managers, customer service staff whose performance was monitored closely during the bank account opening process, and with the

relevant department managers. The project team members were also involved as per their direct role in the process. Table 5.5 shows a brief of the arrangement for internal customer's interviews:

Table 5.5: Internal Customers Interviews

#	Interviewees position	Interviewees unit place	Questions asked
1	Customer service officer	Al-Biereh branch	<ul style="list-style-type: none"> • What are the obstacles and problems that you think are critical to overcome during the process of opening a new bank account from your perspective? • How you think that the process of opening the bank account could be improved from your experience? • Do you have any suggestions or creative ideas to be considered when updating procedures of the opening account process?
2	Customer service officer	Al-Masyoun branch	
3	Customer service officer	Tulkarm branch	
4	Deputy branch manager	Al-Eizarya branch	
5	Deputy branch manager	Bethlehem branch	
6	Gaza branch manager	Gaza branch	
7	Central Operations Dep. manager	Head office	
8	Products Development Dep. manager	Head office	
9	Work Procedures Dep. manager	Head office	

Many important inferences, criticisms and needs have emerged as follow:

1. It should be considered to merge the data update form- Know Your Customer (KYC) with the account opening form to ensure that the answers to the questions are not repeated as the current repetition percentage is 60% between the two forms.

2. The need for sharing data of the customer account in the banks' system with the requirements for common account. Once creating it to ensure that the data are not re-filled again as a primary customer, as well as its requirement for the serial number on banks system.
3. The importance of reducing approvals in the matrix of authorization to open the account according to the degree of risk and the US tax law.
4. The importance of providing measuring tools after service provision and opening the account to identify the customers' satisfaction to build on.
5. Adequate training of employees to open accounts at the branches and departments is required especially for the new ones to recognize the requirements for all opening accounts types and electronic programs professional use , as well as with accuracy and speed of performance, in addition to etiquette and discipline through providing the customers with the service.
6. The need to focus on the customer needs while providing the service, taking into account: **responsiveness, availability, and professionalism.**
7. Reduce the number of customers' signatures required on various forms and pages to the minimum, for example, from 15 signatures to 10 at max on the forms by specific mechanism for this purpose.
8. The importance of dealing with some flexibility when requesting missed documents, for example, it should be possible to accept passport in case that personal identity card is not available.

9. The need to provide effective software programs for opening the accounts so as the data is entered directly from the first time which in turn results in shortening the customer's waiting time at the branch.
10. The need to follow up the series of approvals to open the account among the departments in head office by the central operations department, not by the branch, so as to reduce the time and prevent documents from being missed.
11. The importance of providing sufficient knowledge for the control departments employees who have the authority to approve the accounts opening.
12. The importance of confidence in the testimony of the branch manager and deputy to open the account in case of incomplete documents when the branch is aware of the of customers' circumstances to shorten the steps of control departments verification.
13. The necessity that relevant departments prioritize accounts linked with large deposits to accelerate customer service and opening the account.
14. The need to reduce the number of the screens used to open accounts on "Banks" system for example, it is compulsory for the customer service officer to repeat adding the agency to several screens.
15. It is important that the related employee division at the head office discusses with branch employees before making the decision whether to refuse or approve to open the account.
16. The need to pay special care to the senior customers when opening any other accounts related to them, especially when they have a history of good reputation with the bank and to categorize the customers in each branch to ensure affording the appropriate facilities.

5.7 Voice of Process

By considering the procedures and details mentioned above in sections 4.6 (RACI chart) & 5.2 (flowchart with the related clarifications), the accredited policy of customer acceptance is as follow:

- **Customer Acceptance Policy**

According to the author reviews of the internal sources of the bank, it can be concluded that account opening is considered to be the most important step among the companies and their customers regarding the first impression it generates. Accordingly, services industry pays high attention when provisioning the services, such as the banks in cases of opening new accounts for their potential customers as the studied case. However, the international banking regulations impose a lot of procedures, "Know Your Customer" policies and the changeable environment internationally. As per the procedures of account opening process at Palestine Islamic Bank, they are derived from the Business Process Management Policies & Procedures Guide (2017), the Customer Acceptance Policy at the Bank are reflected as follows:

1. When establishing a relationship with a new customer, it must be accomplished with diligence to identify the customer's identity, and obtain all data relating to the nature of customer activity and the source of funds in accordance with the regulations issued by the regulatory authorities, the regulations and the internal circulars issued by PMA and Financial Follow-Up Unit in Palestine.

2. It is prohibited to deal with anonymous or fictitious persons with commitment to identify customers (whether natural or legal personality) and the real beneficiary, also to verify their identity by providing the necessary documents and data.
3. It is not allowed to open anonymous accounts and not to deal with phantom companies or banks (unlicensed).
4. The need to verify that the customer is not blacklisted (lists of persons who are prohibited of dealing with them- Global level platform) or any other lists issued by the competent authorities, whether at a local or international level.
5. In case that due diligence cannot be done, including the inability to obtain all documents or missed documents proving the identity of the customer, or in case the customer refuses to provide the needed data, the process should be terminated.
6. It is prohibited to make transactions with customers involved in prohibited trade in accordance with the principles of the Islamic Shariah, such as the liquor and drug trade.
7. Remote accounts are not allowed to be opened to any customer regardless of where they reside with a mandatory attendance in terms of face to face process.
8. Notifying officer at the branch should be informed about the account opening form and obtain his/ her approval before opening the account.
9. By consent of the notification officer, the account should not be activated until providing the required documents.

10. The indicators of suspicion should be considered when dealing with customers and opening new accounts for them as well as dealing with these indicators — if any — according to the issued regulations and internal circulars.
11. It is not allowed to open accounts through acting persons on behalf of other ones without the availability of papers and documents proving the nature purpose of the transaction and if it is legally permissible.
12. Never deal with persons who are prohibited from the Palestine Monetary Authority in accordance with its applicable legislation or its regulations.
13. The Bank is prohibited from dealing with anonymous persons or persons with fake or fictitious names, or persons who are considered as prohibited to deal with according to the applicable legislation or regulations of the Monetary Authority (as per the instructions of Financial Follow-up Unit No. 2/2016).

5.8 Key Measures:

The followings are considered key measures to use for process improvement:

1. Waiting time: the time the customer spends at the bank until his account is opened.
2. The nature of the required documents to open a new bank account.
3. Rewriting the customer information using many forms.
4. Number of screens used to complete the process of opening a new bank account.
5. The time needed to open a new bank account.
6. The number of visits the customer accomplishes to the bank for opening the account.

7. Levels of approvals of opening an account.
8. The length of tracked process among the units to open the account.

5.9 Control Charts

Control chart is a statistical tool which displays data average measures and the amount of the variation to manage standardization. It also reflects a line graph showing data plotted over time based on statistical data. In addition, the control chart statistically determines the upper and lower control limits (UCL and LCL). According to Shah et al., (2010), a controlled process means the following:

1. No points are outside control limits.
2. The number of points above and below the center line is about the same.
3. The points seem to fall randomly above and below the center line.
4. Most points, but not all, are near the center line, and only a few are close to the control limits.

Moreover, in order to standardize the process, the following activities are needed:

1. Define the process to focus on and analyze it in its actual state.
2. Optimize the process or setup (e.g. by eliminating process steps which are considered non-value added).
3. Adjust the existing documentation and the new changes.
4. Test the new standard.
5. Sharing what has changed and train the staff.
6. Translate the new standard and circulate how things are solved to other branches.
7. Archive changes and make sure they become part of the process.

- **Data Collection**

In a Lean Six Sigma project, the core issue is to define, to evaluate the process through collecting data, and compare them with the targeted results to evaluate the opportunities development. Accordingly, there are considerable hints about the questions before starting data collection as follows:

1. The type of questions will influence the quality of data, and ends with affecting the results.
2. Most types of questions can be categorized as either evaluating the past period or predicting the future.

At Palestine Islamic Bank, there are 3 major kinds of accounts: current, saving, and deposit accounts, beyond that there are many sub accounts and classifications like: company's accounts, joint accounts, salaries current accounts, and ordinary current accounts.

It is crucial to state that the kinds of current and saving accounts have mostly the same procedures and same time needed concentrating on the individual accounts data analysis, also the procedures of current accounts are mostly used in the other sub accounts at the bank. The companies' accounts had been covered with specific tools and recommendations of the work development as a whole.

According to statistical reviews, periodic internal interviews, verified reports and feedbacks of the concerned units and other specific methods achieved, more than 3 thousands new bank accounts are opened monthly at Palestine Islamic Bank, and most of them are saving accounts generated from other kinds of existed accounts. Yet, some accounts are being rejected due to preventive

actions related to risk requirements and "Know Your Customer" policy, as well as the due diligence and compliance procedures derived from the international banking principles and regulations.

During the period 05-28/03/2018, in coordination with branch managers and customer service supervisors, the time spent in accounts opening process for the sample of 140 accounts from 5 branches were collected. These data covered 2 key types of accounts and 2 sub accounts respectively: **current accounts** (ordinary and salaries), **saving accounts**, **joint accounts** (whether current or saving), and **company accounts** (current accounts) with 7 accounts for each classified account at every single branch as the following in the next page:

Table 5.6: Sample of Opened Accounts in 5 Branches

Account type		Al-Masyoun	Jenin	Gaza	Al-Bireh	Bethlehem
Branch name						
1- Current account	#					
	1	35	33	37	44	30
	2	33	35	35	45	31
	3	34	37	39	39	34
	4	31	34	30	35	29
	5	29	32	37	43	31
	6	30	36	40	44	30
	7	37	30	32	36	29
Average minutes per branch		33	34	36	41	31
Total average minutes		35				
2- Saving account	8	37	33	36	37	25
	9	30	29	33	38	27
	10	27	35	35	33	30
	11	33	30	36	41	25
	12	28	31	38	29	28
	13	30	31	35	35	29
	14	31	34	37	36	30
Average minutes per branch		31	32	36	36	28
Total average minutes		33				
3- Common account	15	51	48	52	50	45
	16	59	58	58	56	43
	17	55	41	44	56	45
	18	63	44	46	48	39
	19	49	59	58	47	50
	20	52	52	49	51	51
	21	58	52	55	53	48
Average minutes per branch		55	51	52	52	51
Total average minutes		52				
4- Company account	22	77	85	118	75	60
	23	91	99	133	69	63
	24	82	103	107	83	71
	25	59	81	111	66	59
	26	63	77	101	83	62
	27	75	112	113	105	68
	28	69	81	99	107	65
Average minutes per branch		74	91	112	84	64
Total average minutes		85				

Accordingly, Minitab software program was used to analyse the current type of accounts including data sample of 5 branches which are reflected in the first segment in the table above. The indicators and inferences are as follow:

Al-Masyoun	Jenin	Gaza	Al-Bireh	Bethlehem
35	33	37	44	30
33	35	35	45	31
34	37	39	39	34
31	34	30	35	29
29	32	37	43	31
30	36	40	44	30
37	30	32	36	29

As it is seen from the data above, the data sample of 5 branches for the current accounts being cached during March 2018 which contains 35 accounts will be investigated using Minitab software program to provide specific indicators and to generate related diagram as the following:

One-way ANOVA: Al-Masyoun, Jenin, Gaza, Al-Bireh and Bethlehem Method

Null hypothesis All means are equal

Alternative hypothesis Not all means are equal

Significance level $\alpha = 0.05$

Equal variances were assumed for the analysis where P-Value= 0.

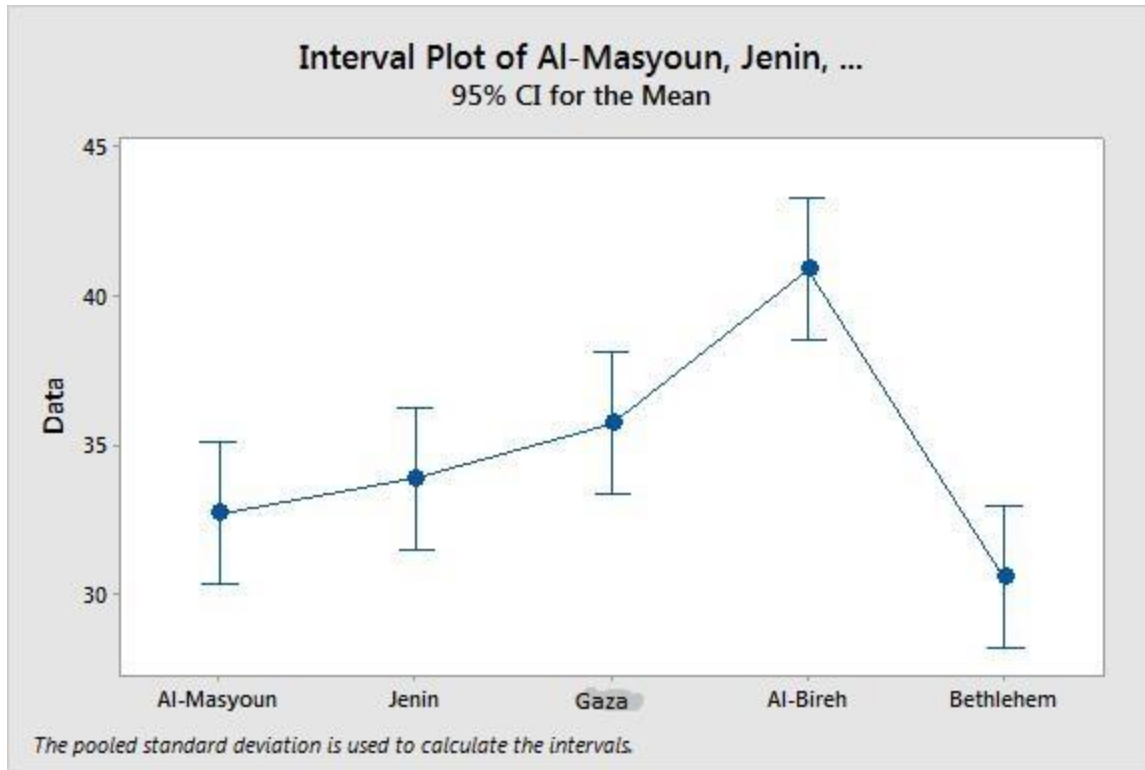


Figure 5.3: Interval Plot of the Current Accounts for Branches: Al-Masyoun, Jenin, Gaza, Al-Bireh and Bethlehem.

It is clear that the confidence interval is high with significant level = 5% and P-Value= 0, so that the potential errors could not be more than 5% at max. Also, when making comparisons among the branches' performance, it indicates that Bethlehem branch is the fastest one in current account opening process, while Al-Bireh is the slowest one in opening new bank current accounts; this is obviously showed in the previous Interval Plot figure.

PMI analysis excel program is used to analyse the demonstrated data of current accounts in Table 5.6, the following control chart has been generated to reflect the trend and performance of the opened accounts, where each 7 consecutive data points are for accounts related to specific branch as shown in Figure 5.4:

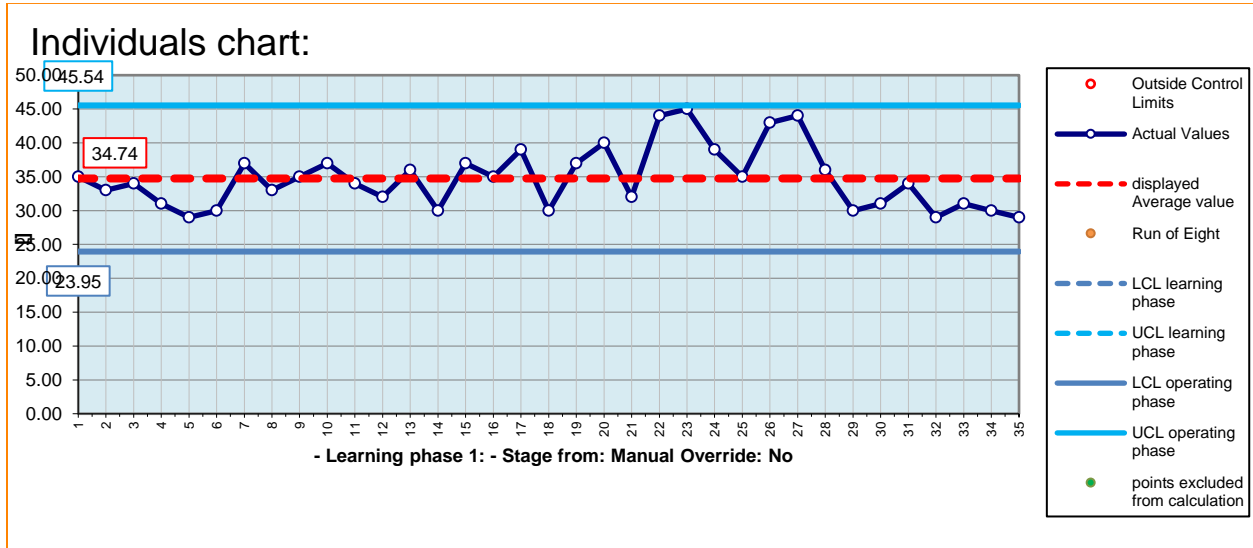


Figure 5.4: Individual Chart of the Current Accounts for Branches: Al-Masyoun, Jenin, Gaza, Al-Bireh and Bethlehem.

Figure 5.4 shows that the average time of current accounts of the 35 mentioned accounts at the 5 branches is about 35 minutes. The shortest time needed to open a new account was at Bethlehem branch with 31 minutes, while Al-Bireh branch had the longest time with 41 minutes.

Moving range chart produced accordingly, Marilyn Wheatley (2016) states that “a moving range measures how variation changes are over time, when data are collected as individual measurement rather than in subgroups. If there is a need to collect individual measurements and to plot the data on a control chart, or assess the capability of a process, there is a need to estimate the variation over time”. Below is the moving range of the previous Individual chart:

Data of the 5 mentioned branches- Moving range chart

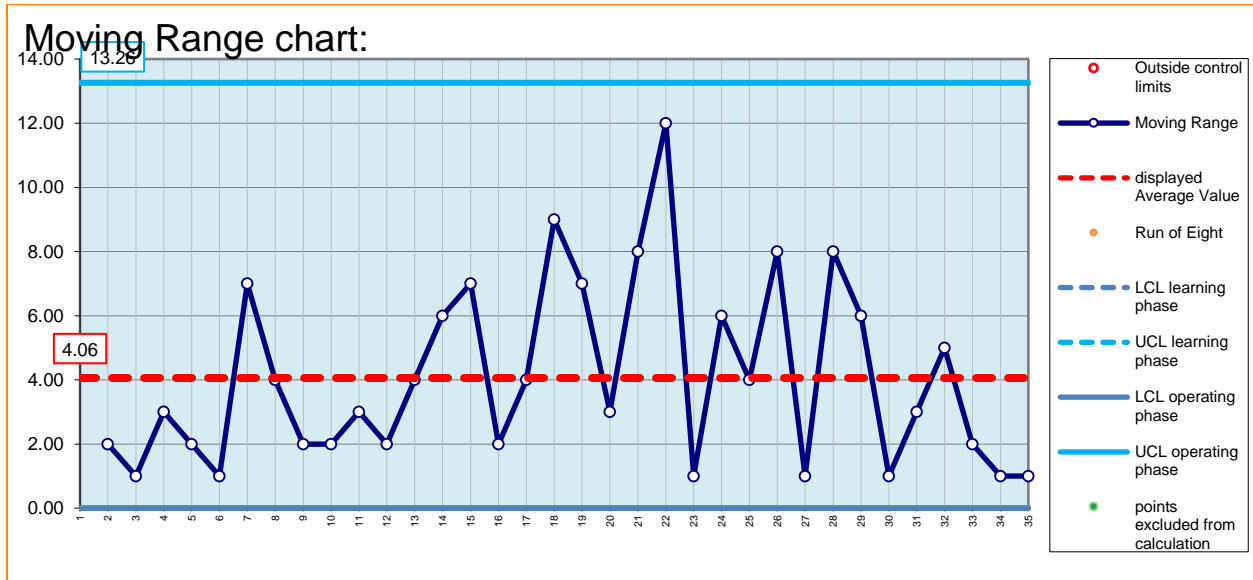


Figure 5.5: Moving Range for the Individual Chart in Figure 5.4

The displayed average value in moving range chart is 4 minutes, while the UCL learning phase is 13.3 minutes.

Through taking a quick look at the statistical data in table 5.6, it turns out that Bethlehem branch is the fastest one in terms of time to open the new accounts of the mentioned segments of accounts, particularly when opening current accounts at the average of current accounts that is 31 minutes. As a result, the individual chart in figure 5.4 shows this low average for opening the current accounts by taking the data points from 28 to 35 which are related to Bethlehem branch.

Accurate follow ups with the deputy branch manager have been accomplished to carry out more data analysis. Table 5.7 shows precisely the data collected including 22 current and saving accounts during the period 09-30/04/2018 identifying the actual start and end times in minutes in each bank account opening process supported by cut-off minutes for each step:

Table 5.7: Accounts Sample of Bethlehem Branch

No	Check customer historical data on system	Cutoff	Fill forms manually	Cutoff	Enter data on Banks system	Cutoff	Sign app A+B with PDF scan	Cutoff	Activation by central operations dep	Total minutes
1	3		6		7		4		8	33
	9:14-9:17	1	9:18-9:24	1	9:25-9:32	2	9:34-9:38	1	9:39-9:47	
2	6		5		5		3		9	34
	8:37-8:43	1	8:44-8:49	1	8:50-8:55	3	8:58-9:01	1	9:02-9:11	
3	4		7		5		4		8	33
	11:27-11:31	2	11:33-11:40	1	11:41-11:46	1	11:47-11:51	1	11:52-12:00	
4	3		6		8		3		7	31
	10:17-10:20	1	10:21-10:27	1	10:28-10:36	1	10:37-10:40	1	10:41-10:48	
5	3		7		5		3		8	30
	1:13-1:16	1	1:17-1:24	1	1:25-1:30	1	1:31-1:34	1	1:35-1:43	
6	4		7		7		4		7	33
	12:05-12:09	1	12:10-12:17	1	12:18-12:25	1	12:26-12:30	1	12:31-12:38	
7	4		7		6		5		8	35
	2:07-2:11	2	2:13-2:20	1	2:21-2:27	1	2:28-2:33	1	2:34-2:42	
8	4		6		5		3		3	25
	12:01-12:05	1	12:06-12:12	1	12:13-12:18	1	12:19-12:22	1	12:23-12:26	
9	4		8		4		4		8	32
	10:57-11:01	1	11:02-11:10	1	11:11-11:15	1	11:16-11:20	1	11:21-11:29	
#	8		11		10		4		12	50
	11:05-11:13	2	11:15-11:26	1	11:27-11:37	1	11:38-11:42	1	11:43-11:55	
#	6		14		8		3		6	43
	9:44-9:50	3	9:53-10:07	1	10:08-10:16	1	10:17-10:20	1	10:21-10:27	
#	3		5		8		4		6	31
	8:55-8:58	2	9:00-9:05	1	9:06-9:14	1	9:15-9:19	1	9:20-9:26	
#	4		7		5		4		8	32
	10:13-10:17	1	10:18-10:25	1	10:26-10:31	1	10:32-10:36	1	10:37-10:45	
#	4		7		5		3		6	29
	9:14-9:18	1	9:19-9:26	1	9:27-9:32	1	9:33-9:36	1	9:37-9:43	
#	4		7		5		3		11	34
	1:12-1:16	1	1:17-1:24	1	1:25-1:30	1	1:31-1:34	1	1:35-1:46	
#	3		6		5		3		7	28
	12:10-12:13	1	12:14-12:20	1	12:21-12:26	1	12:27-12:30	1	12:31-12:38	
#	3		8		5		3		6	30
	9:04-9:07	2	9:09-9:17	1	9:18-9:23	1	9:24-9:27	1	9:28-9:34	
#	3		8		5		4		6	30
	11:13-11:16	1	11:17-11:25	1	11:26-11:31	1	11:32-11:36	1	11:37-11:43	
#	3		7		6		4		6	30
	10:09-10:12	1	10:13-10:20	1	10:21-10:27	1	10:28-10:32	1	10:33-10:39	
#	4		7		5		3		6	29
	2:03-2:07	1	2:08-2:15	1	2:16-2:21	1	2:22-2:25	1	2:26-2:32	
#	4		5		5		3		7	28
	1:06-1:10	1	1:11-1:16	1	1:17-1:22	1	1:23-1:26	1	1:27-1:34	
#	4		7		5		4		7	31
	12:01-12:05	1	12:06-12:13	1	12:14-12:19	1	12:20-12:24	1	12:25-12:32	

Accordingly, the average of total minutes for opening the accounts was 32.3 minutes, and the cut-off averages between the process steps was one minute, while the average for each step is reflected as follows: check customer historical data on system (4 minutes), fill forms manually (7 minutes), enter data on Banks system (6 minutes), sign app A+B with pdf scan (4 minutes), and activation

by central operations department (7 minutes). Figure 5.6 the individual chart for the time needed in each case of opening the accounts according to the previous table in parallel with demonstrating the moving range chart:

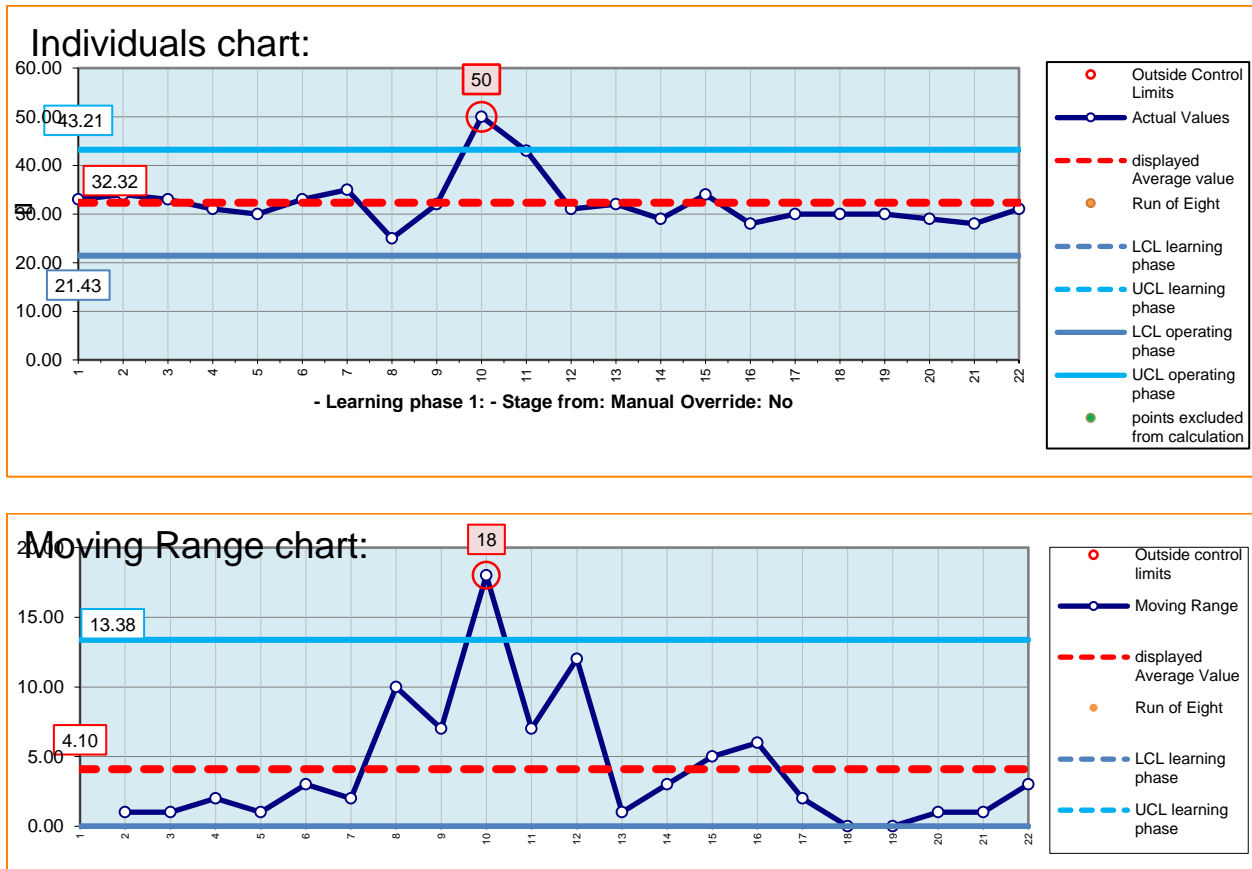


Figure 5.6: Individual Chart and Moving Range Chart for the Accounts Sample of Bethlehem Branch

The average of total minutes among all of the mentioned accounts is 32.3 taking into consideration the assignable cases of 50 minutes and 43 minutes that could be potentially affected by abnormal causes. In addition, the displayed average value in moving range chart is 4 minutes, while the UCL for operating phase is 13.3 minutes.

In contrast, during the period from 25 Jun to 19 Jul 2018, it was coordinated with the customer service supervisor at Al-Bireh branch, which had the longest time in terms of account opening

process according to data in Table 5.6 to collect data for a sample of 21 saving and current accounts to verify status of the process and to prepare for improvements accordingly. The data comes as follows (Table 5.1 is shown again here for clarification purposes):

Table 5.1-"mentioned previously": Accounts Sample of Al-Bireh Branch

No.	Check customer historical data on system	Cutoff	Fill forms manually	Cutoff	Enter data on Banks system	Cutoff	Sign app A+B with PDF scan	Cutoff	Activation by central operations dep	Total minutes
1	5		6		8		5		9	40
	10:27-10:32	2	10:34-10:40	1	10:41-10:49	2	10:51-10:56	2	10:58-11:07	
2	8		7		6		3		12	45
	2:00-2:08	3	2:11-2:18	2	2:20-2:26	2	2:28-2:31	2	2:33-2:45	
3	4		6		4		4		8	30
	9:05-9:09	1	9:10-9:16	1	9:17-9:21	1	9:22-9:26	1	9:27-9:35	
4	3		6		8		3		7	31
	1:11-1:14	1	1:15-1:21	1	1:22-1:30	1	1:31-1:34	1	1:35-1:42	
5	4		7		7		3		9	35
	11:14-11:18	1	11:19-11:26	1	11:27-11:34	2	11:36-11:39	1	11:40-11:49	
6	4		5		5		3		4	25
	12:05-12:09	1	12:10-12:15	1	12:16-12:21	1	12:22-12:25	1	12:26-12:30	
7	8		11		9		9		9	59
	10:07-10:15	4	10:19-10:30	3	10:33-10:42	3	10:45-10:54	3	10:57-11:06	
8	5		8		6		4		5	35
	9:30-9:35	2	9:37-9:45	2	9:47-9:53	2	9:55-9:59	1	10:00-10:05	
9	4		8		4		4		8	32
	10:57-11:01	1	11:02-11:10	1	11:11-11:15	1	11:16-11:20	1	11:21-11:29	
10	3		5		8		4		6	31
	8:55-8:58	2	9:00-9:05	1	9:06-9:14	1	9:15-9:19	1	9:20-9:26	
11	6		6		8		5		7	39
	1:37-1:43	1	1:44-1:50	2	1:52-2:00	2	2:02-2:07	2	2:09-2:16	
12	4		6		5		7		6	34
	9:15-9:19	1	9:20-9:26	2	9:28-9:33	2	9:35-9:42	1	9:43-9:46	
13	7		6		7		6		5	35
	2:08-2:15	1	2:16-2:22	1	2:23-2:30	1	2:31-2:37	1	2:38-2:43	
14	5		6		7		6		5	32
	12:11-12:16	1	12:17-12:23	1	12:24-12:31	1	12:32-12:38	1	12:39-12:44	
15	6		11		6		5		10	43
	1:03-1:9	1	1:10-1:21	1	1:22-1:28	2	1:30-1:35	1	1:36-1:46	
16	3		7		5		4		9	36
	9:16-9:19	1	9:20-9:27	2	9:29-9:34	2	9:36-9:40	3	9:43-9:52	
17	5		8		7		5		13	46
	8:39-8:44	1	8:45-8:53	3	8:56-9:03	2	9:05-9:11	2	9:13-9:26	
18	7		7		9		6		15	50
	1:14-1:21	2	1:23-1:30	2	1:32-1:41	1	1:42-1:48	1	2:03-2:18	
19	5		8		5		4		8	35
	12:09-12:14	1	12:15-12:23	2	12:25-12:32	1	12:33-12:37	1	12:38-12:46	
20	4		7		5		7		13	43
	9:48-9:52	2	9:54-10:01	1	10:02-10:07	1	10:08-10:15	1	10:16-10:29	
21	3		6		7		6		11	42
	1:02-1:05	1	1:06-1:12	4	1:16-1:23	2	1:25-1:31	2	1:33-1:44	
		31		35		33		30		798

The Table 5.1 shows that the average time for opening bank account at Al-Bireh branch was 38 minutes, which is the maximum average among the branches.

Figure 5.7 shows the individual chart for Al-Bireh data sample, while the moving range shows the variations between each account case.

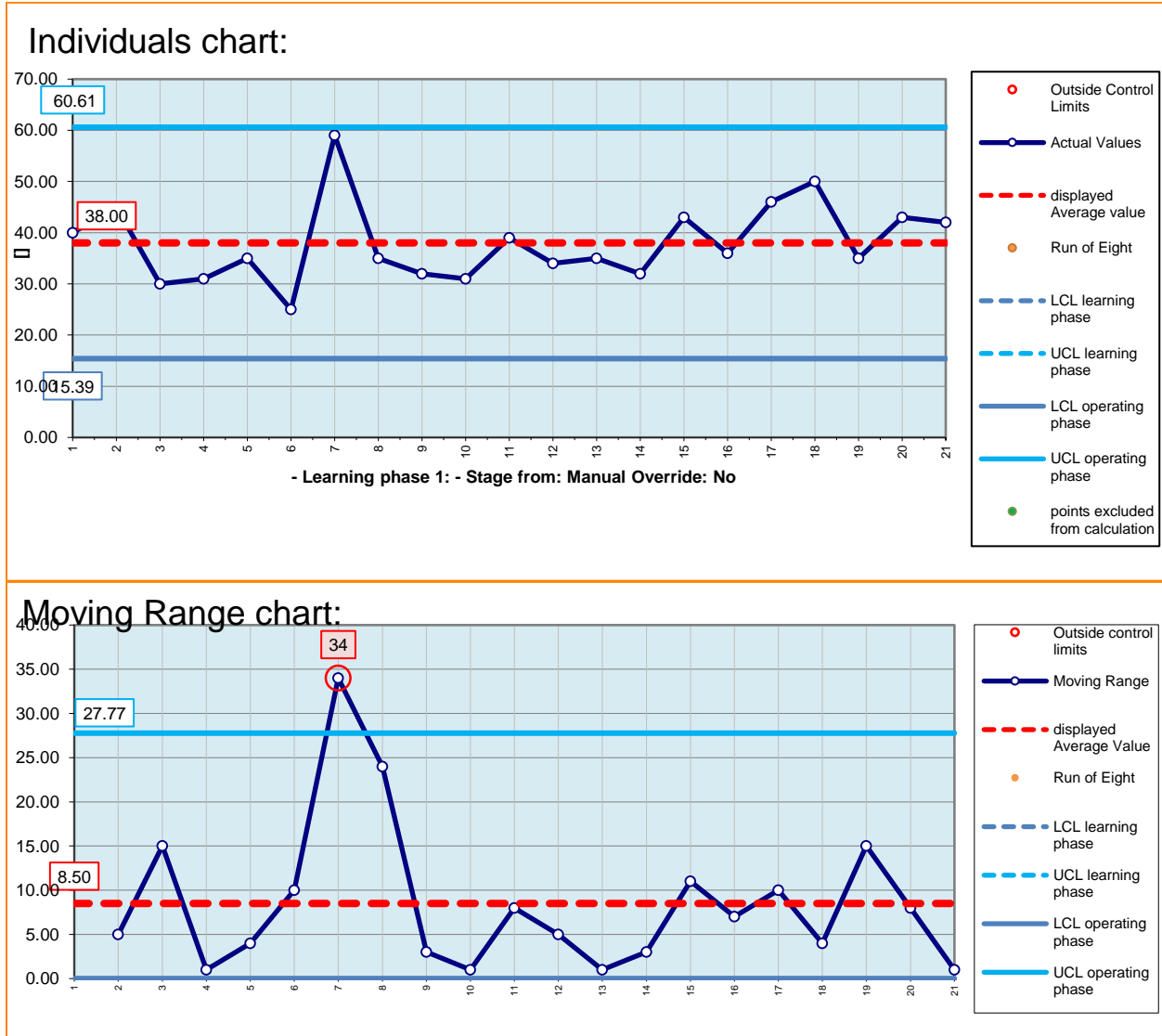


Figure 5.7: Individual Chart and Moving Range Chart for the Accounts Sample of Al-Bireh Branch

It can be said that based on the analysis of Al-Bireh branch data, which is considered to be a priority for improving the bank account opening process.

Chapter 6

Analysis Phase

6.1 Introduction

As a rule of thumb, data analysis is the examination of processes, facts, and data to gain an understanding of why problems occur and where opportunities for improvement exist. According to Edwards (1975), data processed to understand previous performance is called an “enumerative study”, while data processed to predict future performance is called an “analytic study”, and both types of analysis are required to manage processes effectively, so it is important to know which type of study is useful for a given analysis tool.

In this chapter, suitable analysis tools have been used to determine the root causes for a long time spent and waiting of the customers at the branch, through the process of bank account opening to create for the improvement process in the next phase, the used tools are: brainstorming, cause and effect diagram, and 5 Whys tool.

6.2 Brainstorming

Normally, generating thoughts and obtaining creative results require some serious energy and exertion. Current suppositions, limits or standards must be tested and assessed periodically. Thinking “outside the box” should be highly considered to adjust the current steps when needed and to come up with new methods that guarantee better improvements. To do so, Brainstorming is an effective method of generating new ideas for solutions and development. It has been used by the team members to contribute in discovering the reasons of delay in opening a new bank account, the outputs were as follow:

1. There is no flexibility enough of upgraded banking system to reduce the time spent in customer waiting while the customer service officer does all of the required steps and gets the gradual approvals.
2. Many requirements needed from the customer who doesn't know about all of required documents or procedures in many cases from the first time.
3. Complicated processes among the units to verify decision making process.
4. There are no accurate tools for measuring customer satisfaction after finishing the account opening process to build on.
5. Lack of interconnected system to accomplish the process which results in doing work, scrap, downtime and distorting of its efforts to achieve a task on time at a high level.
6. Lack of appropriate trained staff to open accounts at many branches and departments related to this process.

6.3 Cause and Effect Diagrams

Cause and effect diagram (also known as Ishikawa or fishbone diagram) is utilized in quality management to recognize major causes of problem. It also helps to discover the nature of relationship among the causes and the result through brainstorming meetings. In addition, source variation could be identified and then classified into specific factors: measurements, machines, systems, staff, environmental matters or methods regarding to the concerned process.

In the study case, regarding to the mentioned tools of Flowchart, PCD, VOC, and SIPOC, the Figure 6.2 shows a classified potential causes generated from the late process of opening a bank account and form a considerable ground for improvement opportunities:

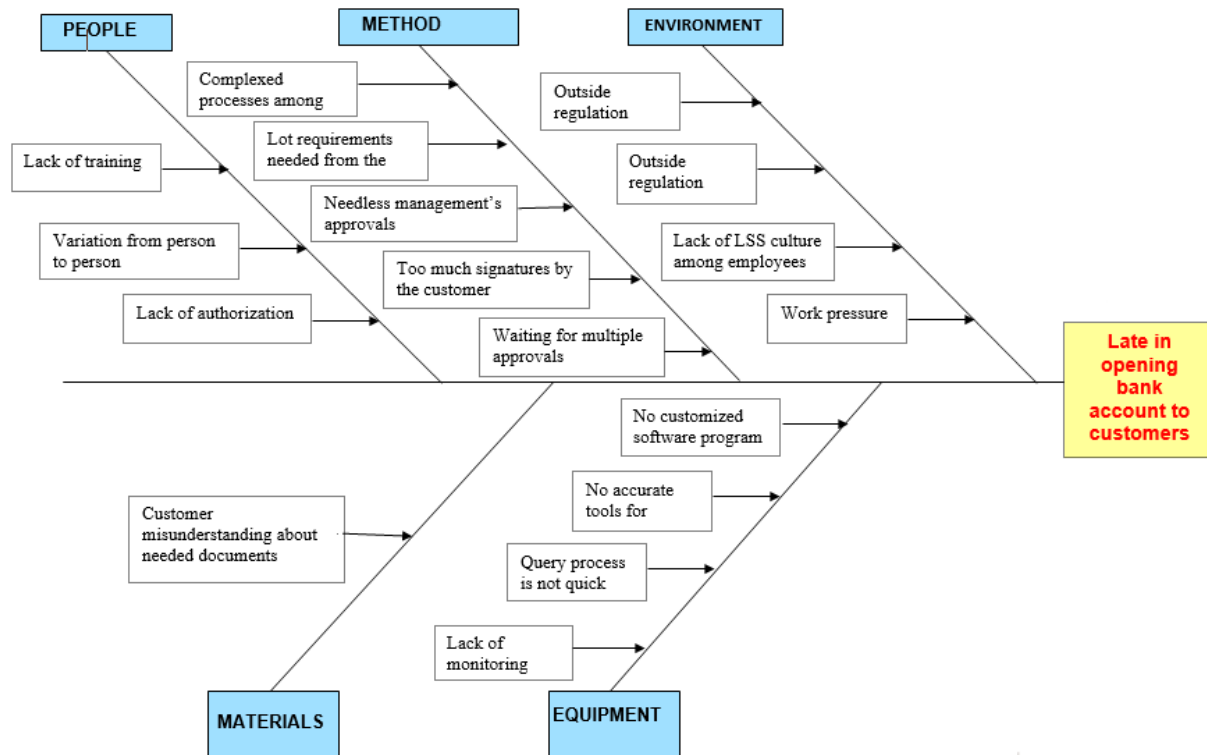


Figure 6.1: Cause and Effect Diagram

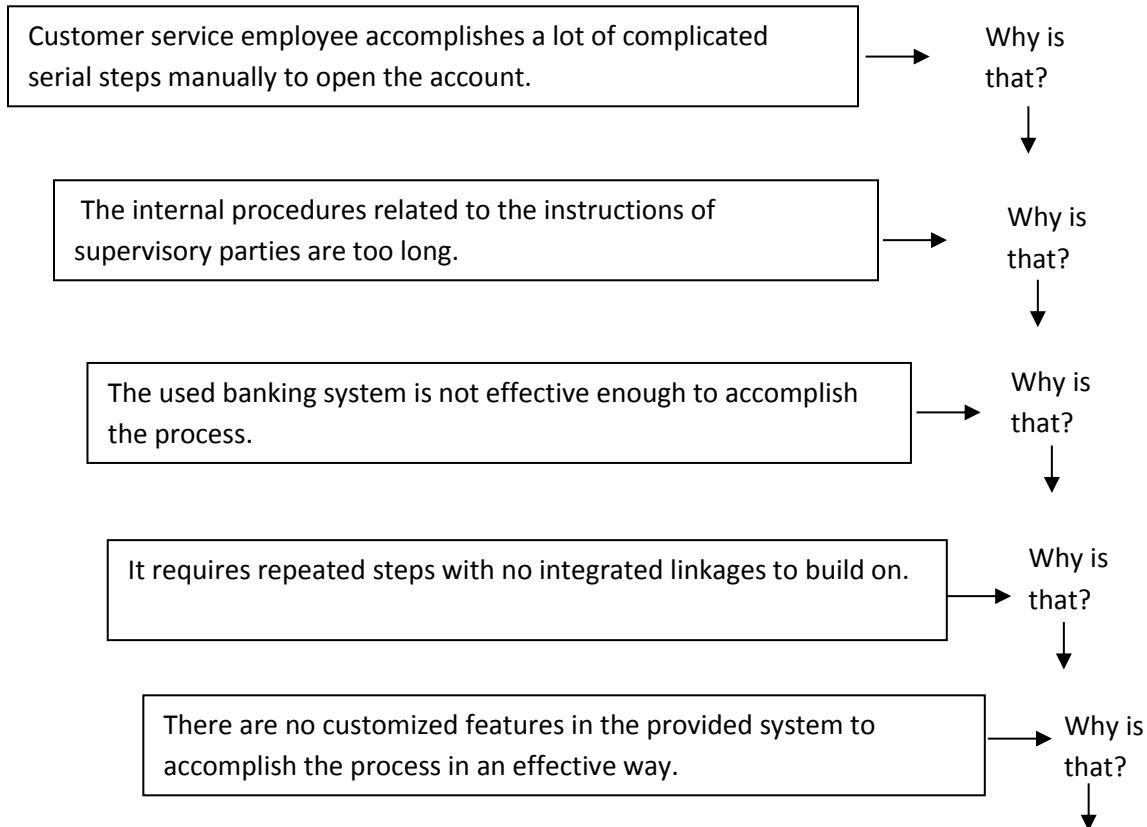
6.4 5 Whys Tool

The 5-Whys tool is straightforward conceptualizing instrument that can help Quality Improvement groups recognize the root cause(s) of an issue. When an issue has been perceived, ask multi "whys" to obtain the root causes. Asking the 5-Whys enables business groups to get comprehensive answers and think about more subtle clarifications or sources of causes.

Worksheet of 5 Whys shows the mentioned tool of 5 whys and its role in defining the root causes of the improvement project:

Many PIB's potential customers complain for the long time spent in opening a new bank account.

Why is it happening?



Action: There is a need to provide more effective software system that integrates all the steps in the process to shortening the needed steps as well as the time and efforts.

Chapter 7

Improve Phase

7.1 Introduction

It is necessary to get practical solutions as much as possible for recognizing causes to be collected in a unit to overcome the obstacles properly to get effective process through opening a new bank account. According to DMAIC methodology, the improvement phase includes the following four major steps to be considered in this improvement project:

- 1- Test theories.
- 2- Project results.
- 3- Preparing the improvement plan
- 4- Implementation solution.

In the following sections, the above four steps are explained:

7.2 Testing Theories

This step consists of four imperative sequential subtitles to build on as follows:

7.2.1 Define Possible Solutions

It is logical to start with defining possible solutions for the business problem after root causes had been identified to improve the bank account opening process. Here, according to the previous analysis and demonstrating many causes that play a role in delaying the process, and preparing possible solutions to be examined is essential to improve the process. The following points reflect initial suggestions as solutions:

1. Preparing for job rotations among the employees at units related to bank account opening process, whether in the same branch, all over branches, or other departments in the headquarter concerning to the process. That's in turn allows to get full understanding of all related staff to the bank account opening process, also it makes movements among employees as quick as possible to distribute work pressure among the staff to accomplish accurate tasks on time without making mistakes or confusion.
2. Conducting awareness sessions about the Lean Six Sigma methodology and its practical concepts which contribute in improving banking processes such as accounts opening with self-obligation by staff in daily work in terms of repeating work, scrap, defects, overproduction, waiting, non-utilized talents, motion and excessive processing.
3. Providing E-Channels to make awareness for potential customers who tend to open bank account upon the needed documents and requirements for each kind of accounts to prevent re-visiting the bank more than once.
4. Providing new banking system capable to keep up with new flexible techniques of banking to implement new instructions and revise speedy, flexible, and comfortable customer services especially the bank account opening process relying on the capability to provide specific analysis about the customers to design appropriate banking products accordingly.
5. Providing periodic trainings to opening account staff to make sure that they have full understanding of the different requirements and procedures of bank accounts, as well

as update them with the new procedures resulted from new internal and external regulations and circulars to guarantee a standardized work among the various units, also encouraging them to provide any improvement ideas related to bank account process.

6. Design a monitoring system and mechanism that can measure employees' performance of accounts opening, collecting data and taking actions based on feedback.
7. Conducting meetings with Palestine Monetary Authority and other supervisory parties to find more simplified ways to opening bank accounts with its requirements. Here, it is important to mention that a workshop was attended to discuss and simplify the procedures and conditions for opening accounts organized by PMA in 28 August 2018 in Ramallah/ Palestine. The Director of which was the Department of Market Discipline at PMA explained that most reasons for refusing to open bank accounts are due to the customer failing to meet the requirements of opening the account, providing the necessary documents, or the customer is unable to prove his profession or a fixed source of income or the customer is classified on the system of returned checks. It is asserted that 40% of the community workers are craftsmen who do not have the right to open a bank account. In addition, the growth rate in saving accounts was 80%, since it raised from \$ 1 billion to \$ 1.8 billion in banks operating in Palestine and 18% growth in current accounts between the period of 2010 and Jun 2018. It was mentioned that customer information updating procedures will be shared among all the banks which will reduce a considerable time in the process of accounts opening.

8. Preparing periodic reviews and evaluation to the current processes like the used approval matrix to reduce the time and eliminate any useless steps.
9. Granting authorizations at logical levels of trained staff to accelerate the required tasks, such as sending the application to the central operations department without A & B levels of signatures.
10. Providing accurate tools for measuring customer satisfaction after account opening process to recognize what improvement forms needed in the process.
11. Allowing to merge account opening form with updated customer's information form, to prevent rewriting the same information in the process.

7.2.2 Select Solutions to Test

Regarding the accomplished consultations of related supervisors at PIB and extensive daily processes and current procedures following up, and verifying the used software programs especially "banks system", accurate image has been formulated to examine practical procedures of the improvement project to consider the flexibility degree in the current environment towards technical changes, a strategic plan and balance sheet.

As per the mentioned possible solutions in the previous section, and depending on the bank's vision and its practical plans to maintain excellence in the provided services, the following justifications were generated to be taken into consideration in selecting the most appropriate solutions to be tested:

1. As inference, providing new banking system containing developed solutions which solve most of the indicated root causes, since the current banking system "Banks" and the used software programs are not flexible enough to accept the needed improvement changes, or even to accomplish testing regarding the improvement project. The new banking system can be mainly used by the back office, where the customer service officer will play a key role as a point of sale and bank's approach in retailing.
2. According to data collected through the project steps till now, many non-value- added steps of delay meet the customer services needed, and there are initial improvement steps to be taken for the major case and other considerable cases. In the same time, it doesn't make sense for the bank to bring developed banking system with its high cost, or to apply expensive changes on the current banking system, just to test and not before making sure to conduct deep study and observations to generate recommended ideas to be implemented.

Accordingly, it is strongly recommended to conduct simulation by taking observations through customer's visits who intends to open new account and count the minutes spent in filling the forms manually, since the following steps supposed to be done next day at max by back office where the account will be opened. At this point, there are no any other visits required to complete the process and to allow the customers to make initial deposits, requesting the desired banking services, like: credit card, SMS, online banking, and check book. In other words, the main improvement idea is that the customer will not stay more than 15 minutes at the bank, comparing with the current process that requires a compulsory waiting for the related units' approvals and serial steps by additional 20 minutes on average.

To take step forward in the improvement project regarding the mentioned key considerations, a simulation was implemented providing a virtual new banking system conducting high levels of performance and overcomes the root causes of the problem.

The simulation included implementing the current initial two steps of the account opening process; check customer historical data on system & fill forms manually (with considering a little pit of basic data entry on the banking system by the branch), then the next steps supposed to be accomplished by the back office. Many advantages generated as follows:

1. Moving the heavy load of customer's information data entry to be done without demanding the customer to wait at the branch by decreasing the time from 35 waiting minutes to 15 minutes on average.
2. Moving the heavy load of customer information data entry to the backend rather than branches.
3. Capturing detailed information from customer on papers for efficiency purposes.
4. Allow initial deposit until the customer account opening has initial approval.
5. Automatically classifying customer AML risk level based on data entered, to avoid human error and spent time.
6. Require AML and compliance intervention of account opening process if required (only if customer risk classification is high).

7.2.3 Develop a Plan for the Tests

According to the previous section, a simulation will be conducted to determine the steps to be taken into consideration for the new banking system. The customer service officer will be asked to record the minutes while the officer conducts face to face meeting with the customer to check the customer historical data in system and let the customer fill forms manually to collect the documents required.

The simulation will take place at Al-Bireh branch that has the longest time average spent in opening the accounts. This test will be conducted after getting the approvals of the top management for a day since the banking issues are sensitive enough to accept adjustments of its procedures in terms of the money, customers' information and financial transactions. The results will be highly considered to take step forward in providing the most appropriate solution.

7.2.4 Carry out the Tests

In the morning of 1 August 2018, a short visit to Al-Bireh branch to conduct training for customer service officers working in opening the accounts. The officers were provided with a brochure containing specific concepts of Lean and Six Sigma and its philosophy of business and vital practical examples. The officers became ready to be honorably involved in the improvement process of opening the accounts at PIB.

In more details, by taking Six Sigma method, it was mentioned that Six Sigma Methodology relies on the use of statistical measures to reduce errors and raise the level of quality and seek to reach them to the degree of perfection.

It was confirmed by the staff that Six Sigma application mechanism includes the use of a set of statistical methods to identify the sources of expenses and waste, and the steps to be taken to improve the process and reduce costs. In parallel, the training provided them with a brief look of Sigma, which is a measure of standard deviation and a statistical measurement tool, to describe the deviation or variation of a given process related to the desired objectives.

Moreover, the staff has recognized that the DMAIC methodology of Six Sigma is a five-step abbreviation that reflects the following: 1- Define, where projects are defined from the perspective of the customers or according to the processes in the organization. 2- Measure, where the level of product quality is measured at the level of product sigma is being specified. 3- Analyze, express the problem reasons that being emerged according to the collected data. 4- Improve: in this phase, problems are being solved and the Sigma level is being determined. And finally, 5- Control: where the optimal mode is adjusted, monitored and standardized at the optimization stage.

In addition, Lean method also has been introduced with its definition, sources and benefits. There was an active instance introduced among the staff tasks. Lean was introduced for its significance of Waste-free production, identification and elimination of non-value added activities throughout the entire value chain, to achieve faster customer response, lower inventory, higher quality and better human resources, it has been also confirmed that pure manufacturing is a production management approach designed to improve through continuous improvement, removal of impurities or waste and has seven sources: Defects, Over-Production, Waiting, Non-Utilized Talent, Transportation, Inventory, Motion and Excessive-Processing.

Indeed, there was a fruitful discussion and valuable contribution at high level of staff involvement to implement simulation in providing the trainer with their personal inferences through feedbacks.

At the end of the training session, the staff were asked to calculate the time spent in checking the customer historical data on the system the time spent by the customer in filling the forms through interviews to open new accounts. The test targeted saving and current accounts with taking 10 cases.

The staff were also prepared to be trained in terms of preventing of rework, scrap, defects, over production, waiting, excessive processing, motion and giving comments on non-utilized talents to specific tasks to adjust it properly. In addition, it was guaranteed that the concerned staff have got enough understanding of utilizing the Lean Six Sigma concepts when opening bank accounts as whole.

7.3 Project Results

This step contains two vital sequential steps after previous testing theories: Project Results of Test and Define Next Steps.

7.3.1 Project Results of Test:

The results showed that the implemented steps mentioned in the last section have decreased the time average of opening a new bank account from 38 minutes (as Al-Bireh branch case) to **14.7** minutes through virtual usage of a new banking system, where the initial two manual steps are just taken to the assumption of transferring the remaining next steps to the back office to be completed the next day without waiting additional time from customer's point of view, so the process time has been decreased by **61.4%**.

The Table 7.1 illustrates the result of simulation test implemented at Al-Bireh branch with 14.7 minutes in average of customer's spent time with the customer service officer to open a new bank account.

Table 7.1: Results of the Implemented Test at Al-Bireh Branch

No.	Check customer historical data on system	Cutoff	Fill forms manually	Total time
1	5		9	16
	11:05-11:10	2	11:12-11:21	
2	4		8	14
	01:15-01:19	2	01:21-01:29	
3	3		10	14
	10:49-10:52	1	10:53-11:023	
4	4		8	13
	10:17-10:21	1	10:22-10:30	
5	3		7	11
	1:09-1:12	1	1:13-1:20	
6	4		12	17
	09:05-09:09	1	09:10-09:22	
7	3		14	19
	2:04-2:07	2	2:09-2:23	
8	3		9	13
	01:58-02:01	1	02:02-02:11	
9	4		8	13
	10:57-11:01	1	11:02-11:10	
10	6		10	17
	09:17-09:23	1	09:24-09:34	

Accordingly, Figure 7.1 represents the simulation test results conducted at Al-Bireh branch where the average is 14.7 minutes and remaining next steps should be processed in the back office:

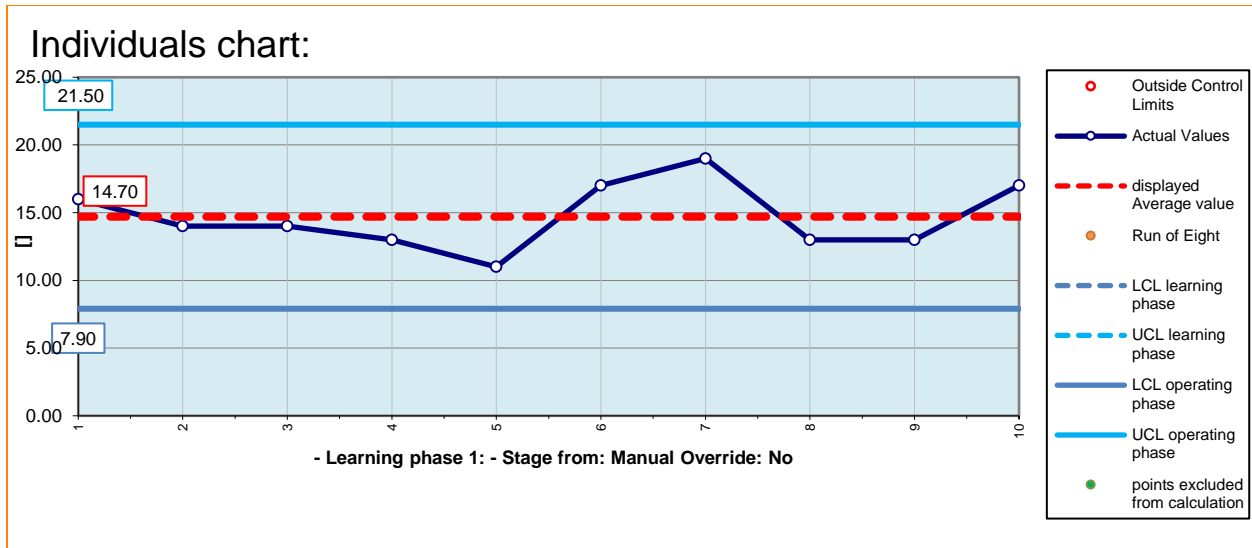


Figure 7.1: Simulation Test Results Conducted at Al-Bireh Branch

The chart determined the UCL= 21.5 minutes and LCL= 7.9 minutes, so that to be considered in the future improvements accordingly.

In addition, Figure 7.2 illustrates the average of variations among the 10 cases taken in the test which was 2.56 minutes.

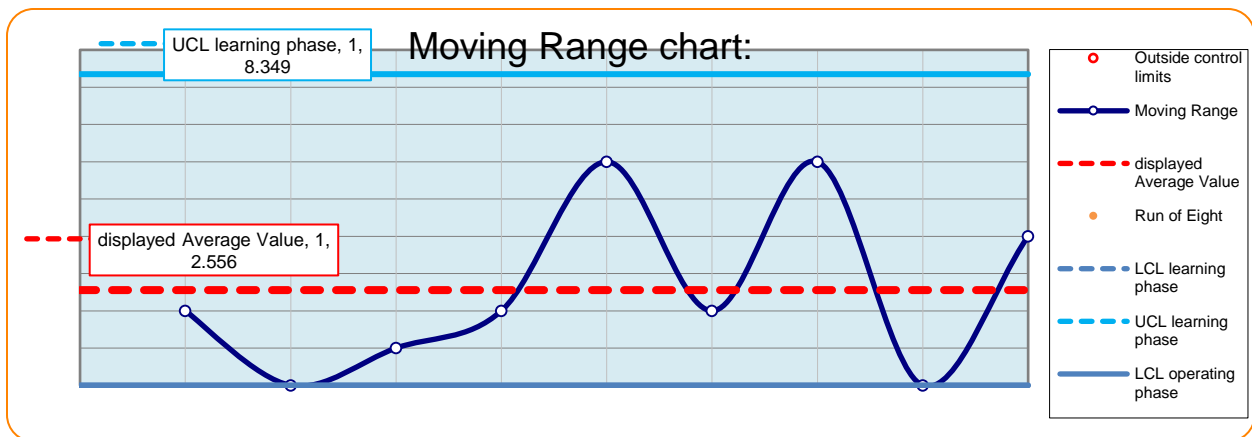


Figure 7.2: Moving Rang Chart for the 10 Cases Taken in the Test

Figure 7.3 illustrates the breakthrough reflected in the new tested process comparing it with the current performance unless it takes the best branch performance.

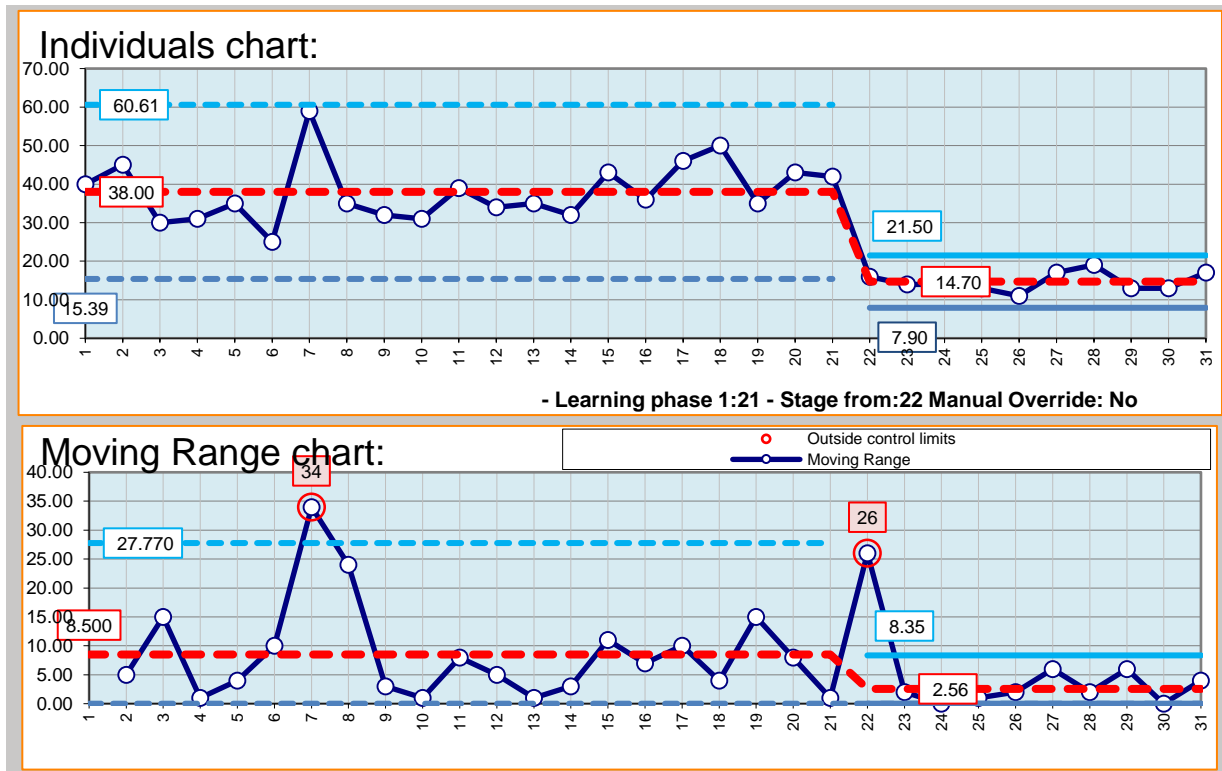


Figure 7.3: Control Chart Before and After Tested Process

Indeed, this chart expresses a brilliant result for the improvement project with decreasing the time needed in more than triple of disclosed percentage with a 61%, especially that all of the 10 cases tested (cases from 22 to 32) are located under the displayed average value line and most of them are located under the lower control limit learning phase.

Getting back to use Value Stream Mapping, it will generate a new one matching the new process of the test executed at Al-Bireh branch, while the resulted flow chart of the new process includes the remaining steps carried out by the back office will be displayed in the next chapter, it reflects the steps processed with customers presence at the branch as follows:

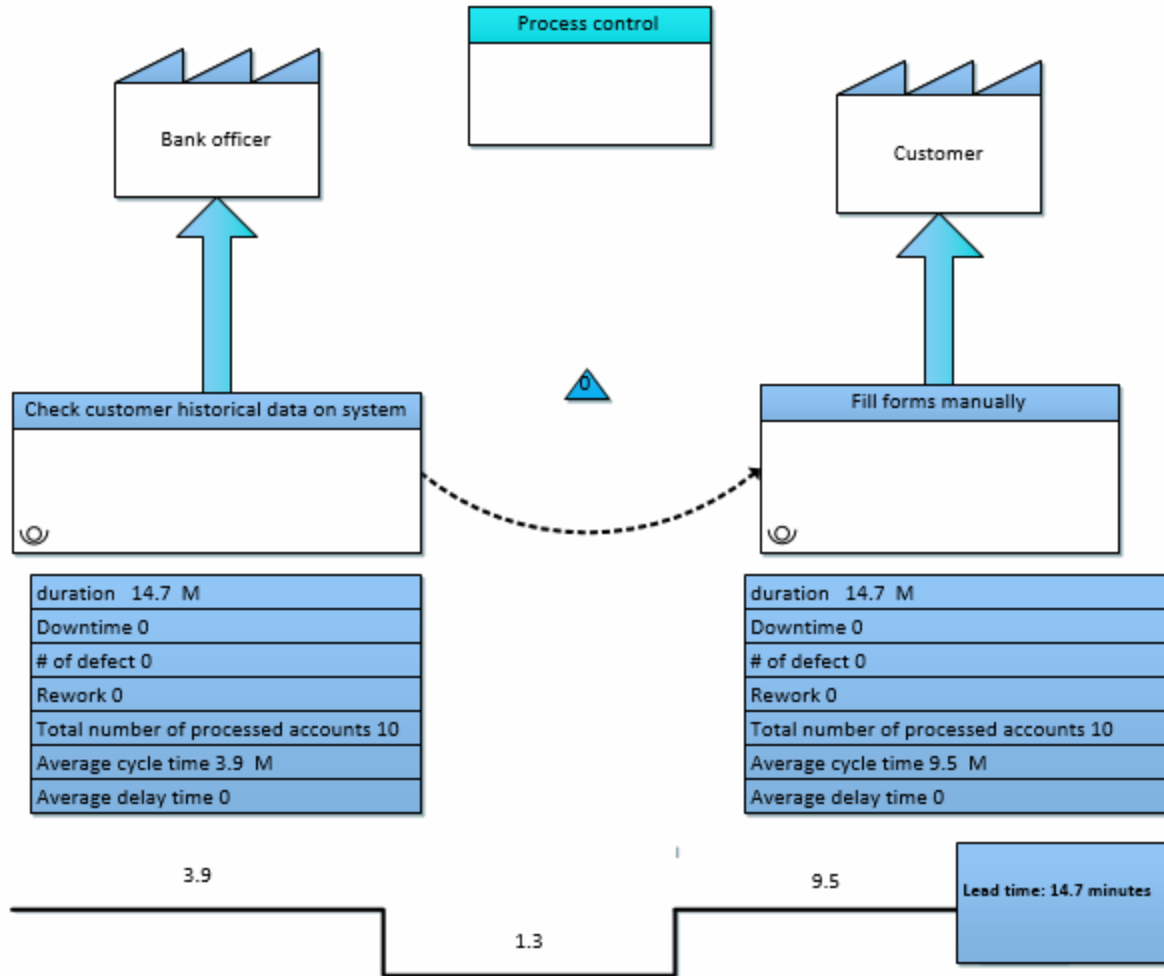


Figure 7.4: New Value Stream for Al-Bireh Branch

7.3.2 Define Next Steps

Many meetings have been held with the concerned parties at PIB to reflect the tested process on a daily work for opening new bank accounts, and to define and suggest progressive improvements relatively. It has showed a contentedness to provide software solutions with prepared developed procedures so that the tasks will be accomplished in a high-quality output.

Fortunately, PIB management has approved recently a budget for providing developed Oracle banking system "Oracle Flex cube Functional and Technical Responses" that has Islamic banking features to successfully meet the development needs of the Bank. In addition, PIB has already contracted with the supplier company (JMR) to provide the system and formed internal committee which includes professional managers from departments and branches to proceed with the composition and transferring processes.

7.4 Preparing the Improvement Plan

Before creating the project plan, there are some activities that need to be completed. These include understanding the implementation environment and determining the competency required. In this section, these activities along with meeting project plan will be discussed.

1. Understand the Implementation Environment

The concerned parties were informed, got many professional facts, and re-assured that Palestine Islamic Bank has a promising environment of flexible infrastructure to accept updates in the workplace, including replacement of software programs, amending the standards and procedures, and being capable to prepare a high performing staff.

Indeed, there is a high commitment towards the practical knowledge to get full understanding of the new banking system features, and to verify the potential capacity to add considerable practical suggestions, derived from the development work to guarantee a high performance of bank account opening process.

In more details, according to the fact that the suggested new banking system has high quality characteristics to be utilized, the following clarifications will give general understanding of the new system and some features about the supposed process in opening a new bank account, that the committee will be involved in, the accesses as follows:

1. The new banking system meets the necessities to effective Islamic banks which offers an Islamic way of keeping money. It's important to say that this solution focuses on Islamic sharia' principles and comply with all PMA legal and regulatory requirements. It gives a splendid tool of computerization over exchange, lifecycle preparing over occasions like records starting and also further more. In more points of interest, the solution will empower PIB to design the applications' formats at financing type levels. The fields to be gotten, the counts and conditions to be utilized, and the approvals to be implemented.
2. The suggested system will come up with many solutions for the mentioned issues discussed in the thesis, and will enable the backend to accomplish. For example, **application form of bank account opening** will capture data once, and automatically fill, calculate and suggest data whenever applicable. The application form will be able to capture necessary data through creating screens necessary for entering data which allow for simple and complex data entry mechanisms, or through retrieval from the core or any other system that is necessary to the application form. Examples of data which can be captured include customer general information, customer classification. The application form will provide insights during the process and will help in decision making process.
3. For the already existed accounts, the new system will provide the bank with the ability to recognize the status of current customers including whether the customers have suffered

from delays in payments, the opportunity costs of customer delays, legal suits which customers face, customer account profitability, and customer related accounts. In addition, the system provides various ways through which the account history is supported. The system provides a complete history of account profile changes like date of change, the change done by, and change authorized by... etc. The history of changes can be archived or purged based on the strategy of the bank.

All of the mentioned points will in turn make a breakthrough of the processes and decrease the spent time for the customers and the staff, which leads to customer's satisfaction, high productivity and having considerable competitive advantages among other banks.

2. Determine Competency Required

Implementing the improvement steps that the new banking system could generate, requires high qualified staff that recognize the importance of continuous improvement in PIB's processes, like realizing the new bank account opening process. Accordingly, it is imperative to confirm that the bank has professional staff in technical and administrative aspects, including top management, related units managers, related staff, who have professional certificates and high-level competency to be utilized.

3. Develop Implementation Plan

Table 7.2 shows the project plan:

Table 7.2: Project Plan of the Improvement Process

Process Step	Duration
<ul style="list-style-type: none"> Defining the basic problems in bank account opening process based on the facts and “as is” situation. 	20. Jan — 21. Feb
<ul style="list-style-type: none"> Investigate the sources of variation and waste in bank account opening process. 	23. Feb – 21 March
<ul style="list-style-type: none"> Test Theories and Study results with Introducing most practical solutions based on Lean Six Sigma. 	24. March – 19 May
<ul style="list-style-type: none"> Keeping implementable improvements in the process. 	20. May – 16 Aug

The new banking system configuration needs a year and a half to be completed; there are five phases to be implemented as follows:

- Education Phase;
- System Study /Gap Analysis Phase;
- Interface Study Phase;
- Migration /Conversion;
- Training.

The needed coordination with top management will be taken to be involved in the sessions related to improve the bank account opening process according to PDSA method to follow up implementing the solutions mentioned in the thesis, and to be configured with the new banking system, to improve bank account opening process as the previous result of tested process through decreasing the time needed by 61% out of the current time spent.

Chapter 8

Control Phase

8.1 Introduction

In the Control Phase, the team members prepare a plan to keep up with measurements of updated process in parallel with providing alternative plan in case there is a deviation.

In this phase, the results should be sustained to maintain the performance of the improved bank account opening process.

8.2 Standardization

After carrying out the test at Al-Bireh branch and obtaining the customer's time spent during opening a bank account around the average time, which was dropped by 61% of customers with less variation and more stability, as figures 7.1 and 7.2 have showed in more productivity and satisfied customers. There is a need to take practical steps to ensure keeping these results in real conditions.

Figure 8.1 represents the new flow chart produced accordingly, which reflects the improved procedure in bank account opening to be included in the new banking system with its technical banking requirements for cooperation between PIB and JMR providing new banking system.

Flow Chart for Bank account opening process at PIB

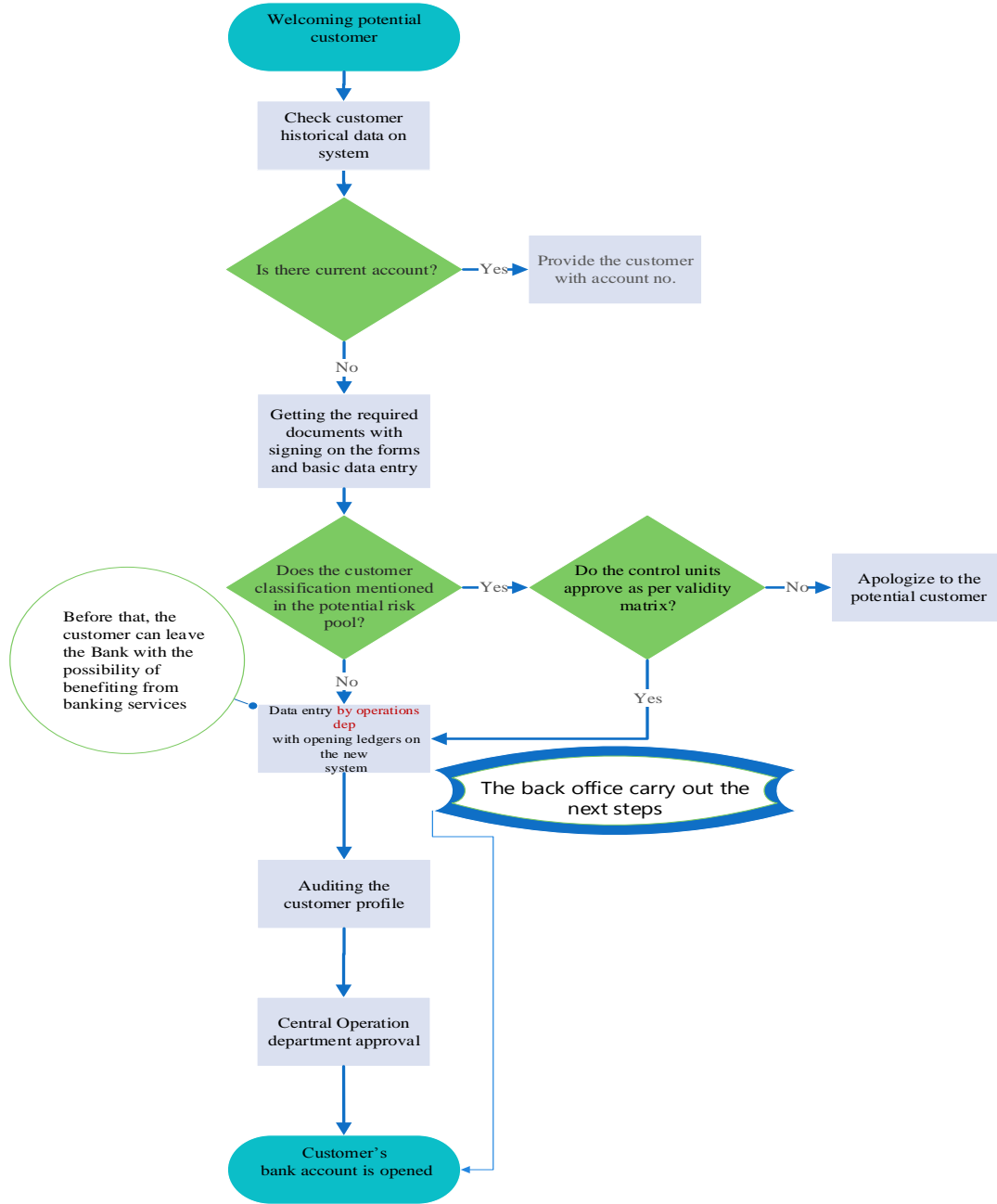
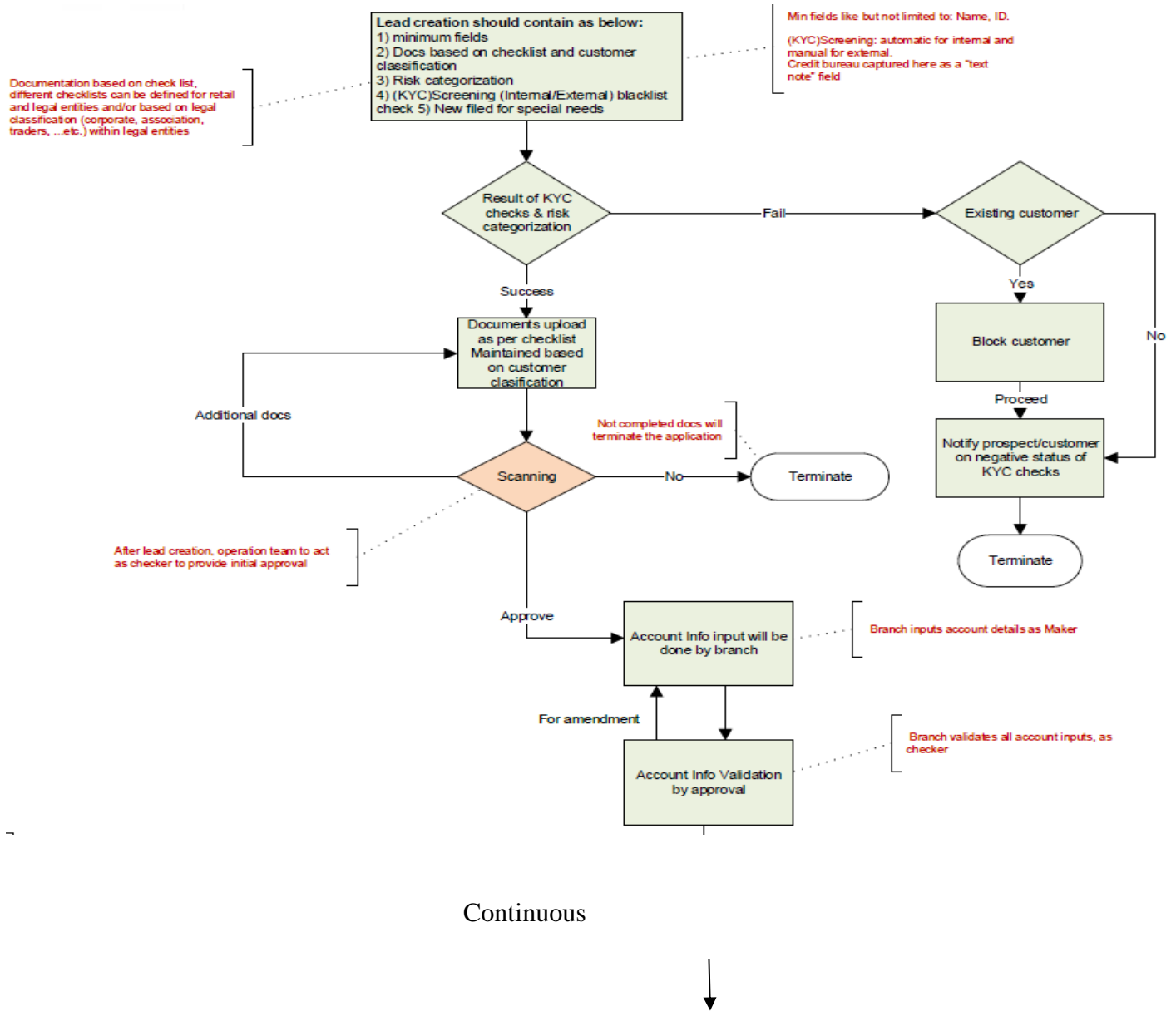


Figure 8.1: New Flow Chart of the Improved Process

Figure 8.2 shows a clarifying chart for the series steps of the new flowchart to design in a new banking system “Oracle Flex Cube Functional and Technical Responses (FCUBS)”:



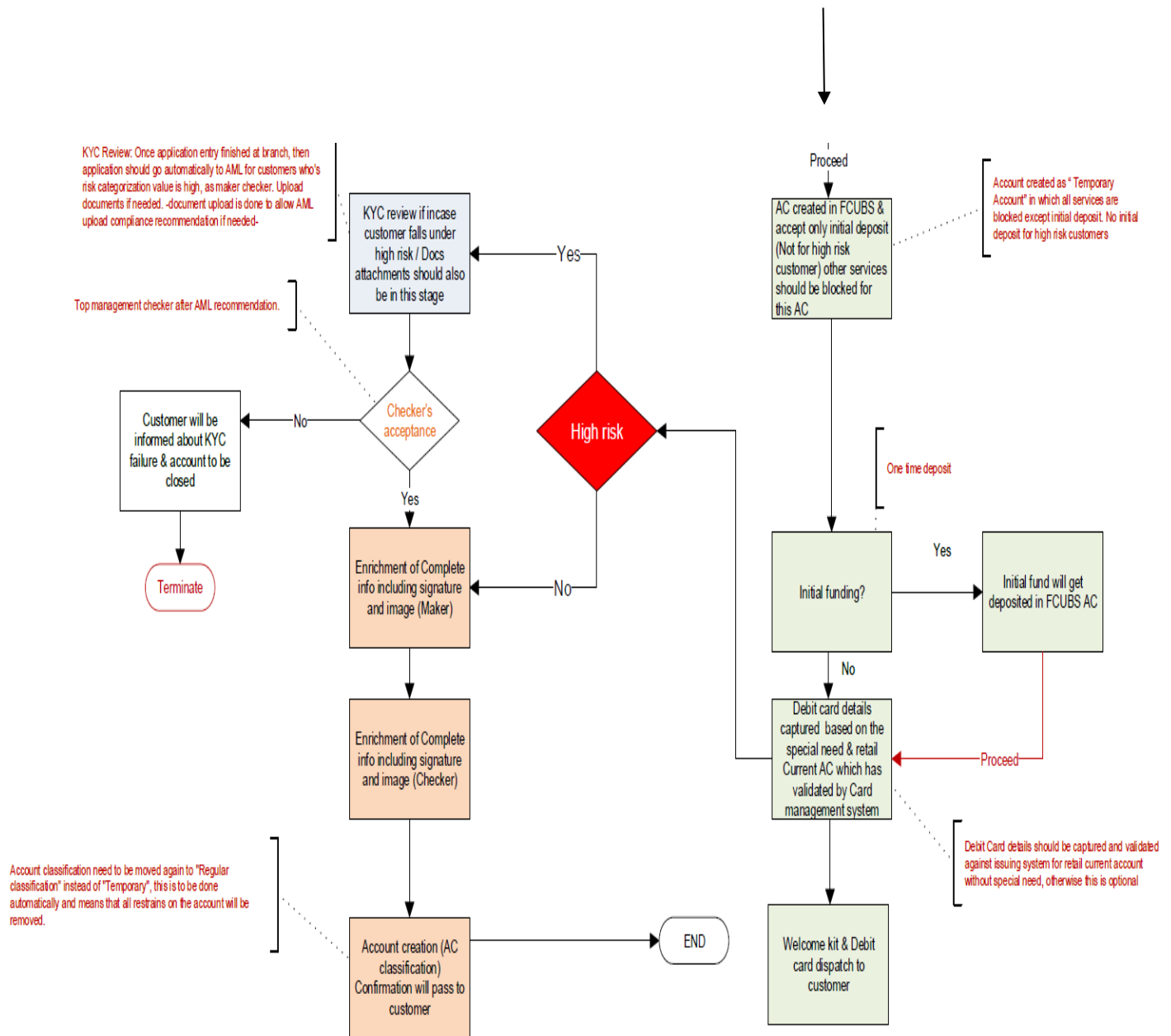


Figure 8.2: Comprehensive Flow Chart of the Improved Process

Accordingly, the needed following-ups will be taken with the concerned parties at the bank to deploy standardized improvements in bank accounts opening process to be designed in new banking system and to monitor the converting process followed by periodic evaluation.

The comprehensive plan of designing the new banking system was previously prepared by the supplier who is currently carrying out the first phase for training the committee members. The choice is following the plan mentioned in the contract allow the committee members to apply progressive improvement and standardization after performing the project. Moreover, the committee of designing the new banking system have disseminated all documents concerning the improvement project among its members, shared them with PIB management, related units managers, communication specific activities, coordination, and providing training, which were prepared by departments and branches at the bank consequently.

Chapter 9

Conclusion and Recommendations

9.1 Conclusion

The significant objective for the improvement project was to reduce the time needed to opening a new bank account process at Palestine Islamic Bank by at least 20%. Profound perception had been taken into account regarding the process relative procedures to know how this service was finalized to the customers. It is significant to shed light on Lean Six Sigma methodology and its tools and role played in the improvement project.

Appropriate mobilization has been prepared for concerned bank units to dictate priority of accounts opening service forms the first impression that the customer captures from beginning the banking relationship.

As per the collected statistical data, there was a need to classify and select the most important accounts to prioritize with focusing on the retail banking, that's why the current and saving accounts with sub accounts are selected to be discussed and examined.

To be able to improve anything, there is a need to measure it with data to start improving. There is a need to control a process to standardize and eventually improve, and to organize staff to one common goal.

Accordingly, a seven- month period was enough to implement the Lean Six Sigma methodology and the most appropriate tools related to the project. The needed requirements were guaranteed through PIB management directing the staff to cooperate and provide the suitable support to complete the improvement procedure.

It was an opportunity to start improvement method to provide more improved services for the customers through aiming to bring new banking system. That is in turn resulted in minimizing the carried out steps to conduct tests resulted in a dropped average of the customer's time spent at the bank by 61% comparing with the current one by 35 minutes on average. That test has shown accurate indicators for improving the bank account opening process by designing high level features of new banking system and standardizing the continuous improvement.

This thesis has proved to be a significant experience to achieve the simulation during conducting test to meet the outlined objectives by reducing the time needed by 61%. In addition, it has answered the question by assuring that improving the bank account opening process using Lean Six Sigma methodology increases customer satisfaction and the process's efficiency. Finally, the thesis has also agreed with the statements of research propositions as follows:

- Improving the bank account opening process using Lean Six Sigma to reduce the time needed through the conducted test.
- Improving the bank account opening process using LSS to fulfill the customer satisfaction.
- The performance of PIB accounts opening officers has been improved through the implementation of LSS project test.

9.2 Recommendations

It can be said that PIB environment has many opportunities of improvement to gain capability of assessment and enhancement of the current procedures in daily work. In addition, there is a need to provide developed software programs giving a quick feedback and analysis for every performed process at the bank, especially the relative ones to reinforce the customers' satisfaction to achieve

accurate inferences of evaluation decision making process having high quality and low variation, taking into account the aspects mentioned in chapters 7 & 8.

The bank has to conduct extensive training in applying Lean Six Sigma methodical tools, providing special programs to get the certain certificate of bank packages, and determining the best bank practices globally since there are many opportunities for the bank to utilize.

Advance improvement opportunities need more examination of diverse parts of Lean Six Sigma to define the most pertinent activities for a regular work. To maintain banking services at Palestine Islamic Bank, it is suggested that the administration should proceed through progressing development activities, concentrating on training, communication, control and monitoring mechanisms through customer service units including departments and branches.

This advancement of work has achieved its hidden targets and it is viewed as the underlying enhancement towards future changes and improvement practices inside the bank.

It is suggested to conduct brainstorming sessions weekly among PIB management, committee of banking system configuration and the related staff, to create improving ideas needed to be included in the new banking system, preparing progressive management plans for extensive training programs, monitoring and controlling critical characteristics process, developing control plans of providing test environment, and preparing various scenarios to accomplish many relative simulations to the most vital customer's requirements, bank's strategy and merging them in a new banking system.

9.3 Recommendations to Other Studies

There is no straightforwardness of decision to apply Lean Six Sigma Methodology to service companies, especially in banks instance regarding to their commitment to meet the international

banking regulations and instructions, taking into account a gradual growth of the financial risks affected by political conditions, which prevent the Banks from simplifying their procedures when providing their services. In addition, there is shortage of customized software programs convenient to LSS tools that guarantee tracking the cost at a level of service in so many banks.

Accordingly, it is recommended that the future research work should firstly display the vital considerations in implementing LSS Methodology especially in the services industry.

Secondly, in this improvement task, it was obvious that the impact of implementing LSS methodology regarding to following international banking regulations had many difficulties to be investigated, taking into account various requirements and details, the performance of employees, customer perspectives, competitors' status, software programs and banking systems as whole.

Thirdly, accrediting LSS Methodology and applying its tools and techniques in banking processes, like opening new bank accounts is linked with the commitment and contribution of key concerned parties, senior official of the Bank with their strict desire to achieve success, and strategic benefits for the Bank. Fourthly, stopping following up the study's recommendations without implementing progressive contribution in updating the banks' environment of bank account opening process and technological development would make this improvement duty meaningless, since the progressive improvement of the service quality at Palestine Islamic Bank is a strategic goal of the management change, focusing on the quality improvement, which is crucial to be enhanced by culture changing elements considering that the LSS Methodology leads progressive measurement to distinctive competitive feature, productivity, efficiency and effectiveness. Fifthly, it is recommended to examine deeply in "DOWNTIME" banking environments aspects to overcome difficulties and apply DMAIC and PDSA models for developing the processes of improving quality.

Moreover, it can be concluded that implementing LSS quality is a tremendous methodology in Quality Management and has been used in other services fields in many countries.

9.4 Contribution to the Theoretical Knowledge

This improvement activity is the first step in the bank account opening process in Palestine and all over the world. This study will be an important reference to many LSS practitioners especially to whom it concerned according to banks services, it sheds light on the top management commitment for quality improvement continuously empowering the employees' participation to contribute in simplifying the internal processes. The LSS tools were appropriately used to reflect analysis and the data provided. This study played a key role in adopting the mixed methods enriching the analysis provided to the implement test in improving the bank account opening process.

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في مرحلة التحكم التي تعتبر المرحلة الأخيرة في منهجية DMAIC، ابتكر الباحث معايير جديدة لعملية فتح الحساب المصرفي بالإضافة الى اعداد مخططات التحكم لمراقبة الإجراءات الرئيسية في المستقبل.

وفي النهاية لا بد من التأكيد على أن منهجية لين ستة سيجما تقوم على إنشاء إطار مكتمل يتضمن أدوات تحسين محددة لتحقيق نتائج مستدامة تساهم في تقليل معدل الوقت المستغرق في عملية فتح الحساب المصرفي في البنك الاسلامي الفلسطيني. من أجل القيام بذلك، يوصي الباحث أن يستمر البنك في إجراءات التحسين، وخاصة التركيز على الاتصالات الداخلية والخارجية، والدورات التدريبية المباشرة، كذلك التركيز على الرقابة الدورية وتحليل التغذية الراجعة باستمرار.

يحتوي هذا المشروع على عدد من الكلمات الدالة مثل:

عملية فتح الحساب البنكي، لين ستة سيجما، الأدوات، تحسين العمليات، الاتصال، التدريب، المراقبة، التحكم، القياس، والتحسين.

ملخص البحث

لين ستة سيجما هي منهجية لتحسين العمليات تركز على التخلص من الهدر والتباين لمساعدة المؤسسات على تبسيط الاجراءات وتعزيز القيمة مع تقليل التكلفة. سيساهم تطبيق هذه المنهجية في الشركات الفلسطينية الى تحسين العمليات، وإرضاء العملاء وتحقيق نتائج مالية أفضل.

ان الهدف من هذه الدراسة هو تحسين عملية فتح الحساب البنكي في أكبر شبكة مصرفية إسلامية في فلسطين باستخدام منهجية "ستة سيجما". يعتبر معدل الوقت اللازم لفتح الحساب البنكي لدى البنك الإسلامي الفلسطيني أعلى بكثير من بعض البنوك الأخرى في فلسطين. هدف المشروع هو تقليل الوقت المستغرق لفتح حساب مصرفي جديد بنسبة لا تقل عن 20% وهذا بدوره سيؤدي إلى نتائج مثمرة مثل تحقيق رضا أكبر للعملاء، إنتاجية أفضل للبنك، وجذب مزيد من العملاء واستقطاب الودائع. بناءً على ذلك، وافقت إدارة البنك على مراجعة وتحليل عملية فتح الحساب البنكي بهدف تقليل الوقت والجهود والتكاليف ذات العلاقة. وعليه فقد تم اعتماد المشروع من قبل إدارة البنك.

إضافة إلى العمل مع أصحاب المصلحة الرئيسيين في البنك، فقد تم استخدام بعض أدوات لين وستة سيجما لجمع البيانات حول التدابير الأساسية لعملية فتح الحساب. تم تحديد المقاييس التالية لتحسين عملية فتح الحساب: الوقت المستغرق من تقديم طلب لفتح حساب مصرفي جديد إلى فتح الحساب بشكل فعلي، بالإضافة الى وقت انتظار العميل في البنك عند موظف فتح الحساب لحين إنشاء حسابه/ها المصرفي. تم رسم البيانات التي جمعت على هذه المقاييس حول فتح الحسابات على مخططات المراقبة (Control Charts) وتم تحديث هذه المخططات كلما تم إجراء التحسينات.

بعد فهم الأداء الحالي لعملية فتح الحساب، تم تحديد الأسباب الجذرية للوقت الطويل المستغرق في فتح حساب مصرفي جديد، مثل: طلب الكثير من المستندات والمعلومات من العملاء، والموافقات الإدارية غير الضرورية، والعمليات المعقدة بين دوائر الإدارة وكذلك الافتقار لأي برامج الكترونية متخصصة في فتح الحسابات. بالإضافة الى ذلك، لا توجد أدوات دقيقة أو مباشرة لقياس مدى رضا العملاء عن عملية فتح الحساب، كذلك افتقار الموظفين للمهارات اللازمة لاستخدام أدوات ومنهجيات التحسين مثل لين ستة سيجما. في مرحلة التحسين، أظهرت النتائج أن الاختبار المنفذ في فرع البيرة قد خفض متوسط وقت فتح حساب مصرفي جديد من 38 دقيقة إلى 14.7 دقيقة أي بنسبة 61.4%. تضمن ذلك تقليل وقت انتظار العميل في البنك عن طريق إلغاء بعض الخطوات التي تمت في المكتب الخلفي بعد مغادرة العميل للبنك. تضمن الاختبار محاكاة استخدام نظام مصرفي جديد.