

**ADAPTING ICT SYSTEMS IN THE SRI LANKAN
BANKING SECTOR
A CASE STUDY OF CRITICAL SUCCESS FACTORS
FROM TWO SRI LANKAN PUBLIC BANKS**

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Master of Business Administration in Information Technology

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The Dissertation is submitted in partial fulfillment of the requirement for the degree
of Master of Business Administration

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Abstract

Banking is the sector where ICT systems are used extensively and successfully. But, the Sri Lankan banking sector, it is not the same. Because there are two sectors such as public and private. The initial data has shown that public sector is fairly lagging behind than private sector. There may be multiple factors contributing it. Based on that, this research is focusing on what are the challenges faced by public bank employees who are implementing the ICT systems and the employees who are using the implemented ICT systems. However, in order to encourage the introduction of new ICT systems it is essential to identify and remedy the challenges faced by all levels of employees in the implementation process. This research aims to find out the critical success factors and the gap analysis of the challenges faced by System Designers, Chief Information Officers (CIOs), Heads of IT and ICT systems users in implementing and using IT systems in their banks. Technology Acceptance Model (TAM) and Task Technology Fit (TTF) model are the tools widely used to identify problems faced in introducing and accepting a new technology or system.

Out of the banks in Sri Lanka identified by the Central Bank, there are two main categories of banks, such as Licensed Commercial Bank and Licensed Specialized Bank. Out of the two categories, four Licensed Commercial Banks and one Licensed Special Bank are selected as the primary study of this research. These selected banks represented three categories Known as public, private and global banks operating in Sri Lanka. The primary study revealed that public banks have to face enormous obstacles and challenges while implementing ICT systems than private banks. Private banks do a thorough need analysis regarding to the ICT systems implementation, where the public banks do not practice those kinds essential analysis. Therefore, two Public banks were selected for the exploratory study. Data were collected by conducting structured interviews with 64 bank employees. Those selected 64 employees are twofold: (a) 40 of IT system implementation employees and (b) 24 of IT system user employees. Further the interviewees were given the opportunity to express their comments and concerns in adapting ICT systems. The questionnaires for the interviewees were developed by TAM and TTF models. After analyzing the data and information collected and evaluating the results, it revealed that there are some CSFs, which would be essential for the successful IT system implementation process.

In this research seven CSFs and Two perception gaps were identified and suggestions were proposed to narrow down the perception gaps. According to the observations and results of this study, some suggestions have been given for further study. The research findings (seven CSFs and two perception gaps) were validated through the expert intuition.

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List of Abbreviations

ATM	Automated Teller Machine
CIO	Chief Information Officer
CSF	Critical Success Factor
ICT	Information and Communication Technology
IT	Information Technology
ITDBS	IT Driven Banking Services
PEOU	Perceived Ease of Use
POS	Point of Sales
PU	Perceived Usefulness
SMS	Short Message Service
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TTF	Task Technology Fit

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CHAPTER 01: Introduction

1.0 Introduction and research background

The modern world is very competitive and technology biased. People, organization or any financial institution capable of using advanced technology, will be able to face the competition and pressure of their competitors. It is a general truth that the banking industry is seeking new technology to advance their functionalities for promptness and to better serve their customer needs. As a technology, banks prefer to embrace information and communication technology (ICT). According to the definition by Agbolade, “Information and Communication Technology (ICT) is the automation of processes, that ensure smooth and sufficient running activities by using computers, software, telecommunications and also other accessories” (Agbolade, 2011). Anxiousness to the ICT is not enough. The banks have to implement those ICT systems to their operations. While implementing those ICT systems the banks have to face remarkable challenges, issues and controversies.

In adapting to ICT, there are three major challenges to face. Those are Hardware, Software and people related challenges. The Hardware and Software less affect challenges when compared it with the people related challenges. Maldeni and Jayasena (2009) stated that successful applications affect remarkably high to the growth and competitiveness of banks. Furthermore, there is a quantitative and a qualitative imbalance in the supply of skilled labor and availability of skilled labor is a questionable resource requirement. All over the world, growth in investment in Information Technology (IT) has considerably increased, because of the acceptance of user decision making process via IT and its usage, an increasingly essential technology implementation and management issue (Selemat et al., 2009). The management of the organizations also has to face enormous obstacles while implementing those complex Information and Communication Technology (ICT) systems.

The major issue is the acceptance of the ICT systems by the users or employees. User’s acceptance is defined as “the demonstrable desire to employ information technology for the tasks that designed to support by a user group” (Dillon and Morris, 1996). It is also clear that if the employees are not willing to accept those ICT systems, the management of the organization, who are deciding to implement such a system, can’t get the maximum result of their effort. Similarly, Davis and Venkatesh (1996) stated that, Information system

implementation will not bring maximum benefits unless the users are not willing to accept the implemented information systems. So, it is very much essential and crucial to do a study of the acceptance of IT among the users or the employees who entangle with IT systems (Selemat et al., 2009).

There are three kinds of models that are used for technology acceptance researches (Selemat et al., 2009). Those are Technology Acceptance model (TAM), Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) (Selemat et al., 2009). Two kinds of models used in this research called Technology Acceptance model (TAM) and the Task Technology Fit Model (TTF). TAM present two particular beliefs, those are perceived usefulness (PU) and perceived ease of use (PEOU) for computer acceptance behaviors (Davis, Bagozzi and Warshaw, 1989). The extent to which a technology aid to an individual to perform his or her set of task is called as Task Technology Fit (TTF) (Goodhue and Thompson, 1995). TTF model consists of four major constructs, such as, Task Characteristics, Technology Characteristics, Performance Impact and Utilization. Task characteristics and technology characteristics together affect the task technology fit (Dishaw, Strong and Brandy, 2002).

This research is conducted by using the Technology Acceptance Model and Task Technology Fit model. The main focus of this research is to determine the challenges that the management level employees and the IT staff level employees in the banking sector have to face while implementing the ICT systems and identify the critical success factors for the successful ICT systems implementation.

Some important facts of the research background can be summarized as follows:

1. When considering the global context, acceptance of user decision making process via IT and its usage, investment in Information Technology (IT) has considerably increased.
2. Hardware, software and people related challenges are the major three challenges to face In adapting to ICT systems
3. There is a quantitative and a qualitative imbalance in the supply of skilled employees and scarcity of the skilled employees is one of the top issues.
4. Management of the organization cannot get the maximum results of their effort if the employees are not willing to accept the new ICT systems.
5. Before implementing the ICT systems it is essential to investigate the user acceptance.

1.1: Research Scope

In the preliminary stage, this research focuses attention on five banks which belong to a licensed commercial bank sector and licensed specialized banking sector. Those selected five banks are represented public, private and global category. For the exploratory study, this research narrows down the five banks into two banks and focuses on them. Those selected two banks belong to the government sector and those are representing licensed commercial bank sector and licensed specialized banking sector. Selected two banks operated at the peak level of their respective sector and intensively use ICT systems for their day to day operations.

1.2: Problem statement

On the above background, three important questions are cropping up. The first question is, what the challenges faced by implementation level employees in implementing ICT systems in their banks? The second question is, what the critical success factors in such implementation? and the third question, what the human capacity development requirements for such implementations.

All levels of employees of the banking sector in Sri Lanka identify multiple issues/challenges related to implementing and using IT systems. Most of the IT related issues are because of perception gaps of different level employees and improper evaluation of requisite IT skills of employees. Considering the banking sector in Sri Lanka, public banks may face additional challenges such as lack of required talent as well as skills and lengthy procedures for investment related activities. But, private banks may easily absorb new ICT systems and move with that technology in a smooth manner. This may be a reason, public banks are somewhat behind in adopting new ICT systems. So, it is more suitable to consider the public banking sector to grasp the real challenges that the management level employees and the IT staff level employees have to face, while implementing the ICT systems (by analyzing the data from questionnaire 01).

1.3: Objectives of the research

In order to address the above mentioned three research questions such as; What the challenges faced by implementation level employees in implementing ICT systems in their banks, What the critical success factors in such implementation and What the human capacity development requirements for such implementation, this research addresses the following primary and secondary objectives

1.3.1: Primary objective

- To find out the critical success factors (CSF) related to employee skills and perceptions for ICT implementation in the banking sector.

1.3.2: Secondary objective

- To conduct a perception gap analysis of banking employees at different levels for ICT implementation processes.
- To improve the research related writing skills.
- To develop the soft skills, such as communication, Interpersonal skills and personality traits, etc.
- To develop the analytical skills and decision making ability.
- To build up strong network and relationship with top level employees in IT sector in the banking industry.

1.4: Rationale and Significance of the Research

In the global context, the banking sector has increased their leaps and bounds with ICT. But, it may not be the same scenario when considering with the Sri Lankan banking sector. There may be some reasons for that. One may be capabilities and perceptions of human capacity and the other may be the Investment in ICT. But the investment in IT is negligible, because, none of

the banks are poor in the current economy. The banks have more than enough money for the investment purposes. But when considering the capabilities and the perceptions of the human capacity, may be the most appropriate reason. Modern day's bank customers tend to move to more digital banking activities that may save their time and increase the security of the transactions. To convert traditional banking functions into digital functions, which are the use of digital technologies to change a business model and provide new revenue and value producing opportunities, the banks have to introduce new IT systems to their operations. Introducing new IT systems as a replacement of well-established past IT systems may create challenges and issues to every employee level in the banks because of the capabilities and perceptions of the employees. Prior investigation of the challenges and issues may aid to successful implementation of the new it systems.

Via this study, it will allow identifying the numbers of challenges and issues that may arise in adopting new IT systems to the banks and also it will enable to take new practices and methods to follow prior to implement the new IT systems to avoid the employee resistance. Hereafter in this study, It will make the top level employees in the banking sector who are responsible in implementing new IT systems identify the important factors.

1.5: Thesis Organization

The thesis organization consists of five chapters as follows:

CHAPTER 01. Introduction and Research Background

This chapter consists of the preliminary introduction and some important facts of the research background. Further the problem statement and the primary and the secondary objectives of the research are defined.

CHAPTER 02. Literature Review

This chapter represents the gathered information from the relevant secondary sources such as previous researches, journal publications and conferences. The literature review is categorized according to the following areas.

1. The advantages of adopting new IT systems
2. Theories and models for technology adoption
3. Technology acceptance model (TAM)
4. Task Technology Fit (TTF)
5. IT systems used in the banks
6. Impact of ICT in banking sector
7. Interview based literature review

CHAPTER 03. Research Design and Methodology

This chapter provides insight into research design and methodology including the model used in the research, technology acceptance model and Task Technology Fit model, population selection, questionnaire design development and data collection procedure.

CHAPTER 04. Data Analysis

The intention of this chapter is to explain the findings of the study related to the research problem. Moreover, the findings are graphically illustrated in this chapter.

CHAPTER 05. Conclusion and Recommendation

This chapter will provide the main findings in research problem such as the critical success factors (CSF) related to employee skills and perceptions for ICT implementation in the banking sector. Furthermore, recommendation part will present some discussion on general aspects regarding the findings and lessons learned obtained from this study.

CHAPTER 02: Literature Review

Literature review was conducted to identify the theories and models related to this research. It is paramount important to identify the current status cope of the Sri Lankan banks. In order to do that, we did the primary data gathering from the CEOs of five banks. The findings of the gathered data were also summarized in this chapter.

2.1: Advantages of adapting new IT systems

Modern era of information and communication technology (ICT) is substantially applied everywhere. Mohlala et al., 2012 opined that the ability and capability of using information technology efficiently may significantly contribute to modern organization's success. Improvement in technology is a mirror image to enjoy economies of scale in production, development of new products and services; creation of new knowledge, and ultimately it helps to increase the products quality and services efficiency also (Selemat et al., 2009). Similar opinion stated by Luka (2012) the efficiency and the effectiveness of the banking sector increases by using ICT, and more than that in the managerial decision making process, business process and Workgroup collaboration. According to the article Luka considered about four categories such as, productivity, market structure, innovation and value chain (Luka, 2012). In addition to that, the ICT, banking adaptation leads to increase the profit, deposits and loans per branch (Onay and Ozsoz, 2013).

Canato and Corrocher (2004) pointed out that new products and financial services can be developed by adapting to the ICT applications. But ICT applications may raise some uncertainties about the way in banking activities could be organized in order to gain the maximum advantages of the new technical opportunities. The application of ICT concept is valuable, for techniques, policies and implementation strategies for banking services. The above mentioned areas have become the subject of fundamental importance and concerns for every bank (Agbolade, 2011). According to the Agbolade (2011), marginal change in the level of the investment to the ICT in the banking industry will result in an appropriate profit increase. In between bank profitability and ICT, where there is a positive correlation. Every organization has the main and ultimate goal of enhancing the stakeholder's profit. While adaptin the ICT systems, every bank is expecting for more profit. Uwizeyemungu and Raymond (2011) stated that the ultimate objective of any kind of management is to gain more profit and enhance the

goodwill of any organization. That's why they introduced new patterns, technologies, methods and trainings to their organization. The most prominent objective of IT adaption is to increase stakeholders profit and secure organization's future and ensure the organization's growth. Furthermore, adaption of IT tends to increase more areas in the banking industry such as, staff performances, mobilization of resources, process restructuring and most importantly, it enhances the best customer service for retaining customers of the bank, which adapt to the IT systems than their competitor's customer services (Uwizeyemungu and Raymond, 2011). Furthermore, Nasri and Charfeddine (2012) opined that the adaptation of technology has granted benefits such as greater productivity, profitability, efficiency, customer satisfaction, convenience and 24*7 operations facilities. So, to gain more competitive advantages it is essential to adapt to ICT systems than stuck into the traditional systems by considering the banking context. Furthermore, application of ICT enhances the performance of the organization and not only enables to cost cutting activities, but also for establishing better customer service activities (Ashrafi and Murtaza, 2008).

Adopting to the ICT systems will enhance the bank performance in several ways. But, employees fluent in digital language and employees who are innovative and creative would be the answer for several types of questions such as how can Sri Lankan banks keep alongside each other of ICT system changes? How can the banks stay ahead and introduce new banking products to the next generation? (Maldeni and Jayasena, 2009). When considering the past two decades more researches are carried out about IT acceptance. Because of that several kinds of theories have emerged and practiced. Those theories enable to create new insights for individual and organizational levels acceptance and used (Lai and LI, 2004).

2.1: Theories and models for technology adaptation

There is some set of theories and models which are used to describe the technology adoption. There are some well-known theories such as Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), Technology Acceptance Model by Davis (1989) and Theory of Planned Behavior (TPB) by Ajzen (1991). Similarly, Selemat et al., 2009 stated that, there are three common types of models used in technology acceptance researches, such as, Theory of reasoned Action (TRA), the Theory of the Planned Behavior (TPB) and the Technology Acceptance Model (TAM).

The above mentioned three models, TAM has been most widely recognized and used to predict the computer usage behaviors (Seyal and Rahman, 2009).

2.1.1: Technology Acceptance Model (TAM)

Johar and Awalluddin (2011) stated that TAM has shown clear evidences to be a useful theoretical model for technology acceptance researches. By using the TAM model, it enables to understand and explain user behavior in the information system implementation. Dillon and Morris (1996) opined that the concept is not being applied in some situations also. There are, users who claim they will engage it without providing evidence of use, or for the use of a technology for purposes unintended by the designers or procurers. Furthermore Dillon and Morris (1996) pointed out that user acceptance is highly essential to the success of new information system implementation and Lack of user acceptance is a great barrier to the success of new information systems. Again, as noted by Dillon and Morris (1996), both researchers and practitioners are highly interested in understanding why people accept information technology and to develop better methods for designing, evaluating, and predicting how users will respond and what the responses to new technology are.

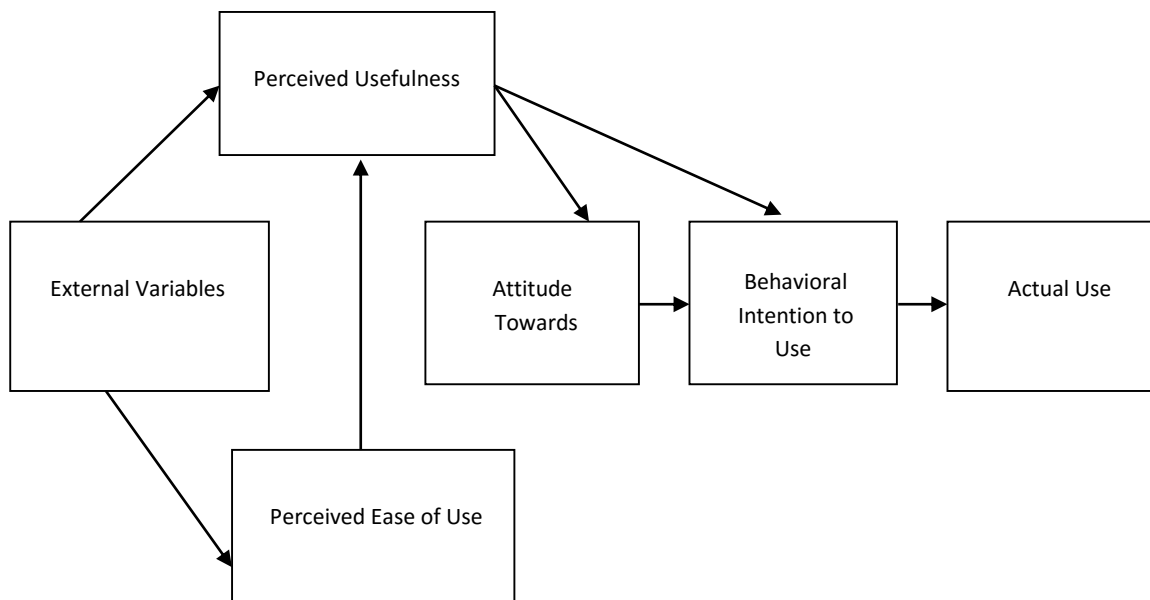


Figure2. 1: Original Technology Acceptance Model (TAM) by Davis et.al. (1989)

TAM present two particular beliefs, those are perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, Bagozzi and Warshaw, 1989)

According to the TAM model, actual use of technology system is influenced by several kinds of factors. Those are user’s behavioral intentions, attitudes, and perceived usefulness of the system and perceived ease of the system. But above mentioned factors can be influenced by directly or indirectly by the actual use of technology system (Park, 2009).

The major goal of TAM is to predict information system acceptance and diagnose design problems before users have experience with a system and also that is determined by two factors: perceived usefulness and perceived ease of use (Dillon and Morris, 1996).

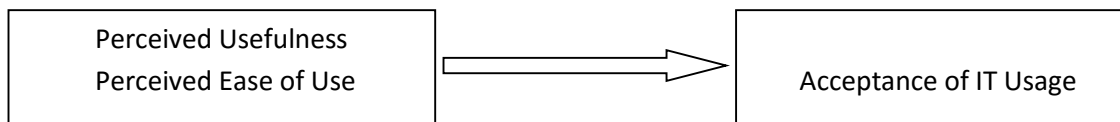


Figure2. 2: Two cognitive beliefs of TAM

Perceived usefulness is defined as “degree which a person is of the opinion that using a particular system would enhance his or her job performance”. Perceived ease of use is defined as “the individual’s perception that using a new technology will be free of hardship and hard effort” (Johar and Awalluddin, 2011). Similarly, Venkatesh and Bala defined that Perceived usefulness is “the extent to which a person believes that using and IT will enhance his or her job performance” and perceived ease of use, defined as “the degree to which a person is of the opinion that using an IT will be free of effort” (Venkatesh and Bala, 2008).

Lergis et. al., (2004) stated that, under Perceived ease of use and perceived ease of use; they observe that four items are more frequently used:

Table2. 1: Four items of perceived ease of use and perceived usefulness

Perceived Ease of Use	1. Learning to operate (the application) is easy for me
	2. I find it easy to get The (an application) to do what I want to do
	3. The (application) is rigid and inflexible to interact with
	4. Overall, I find the (application) easy to use

Perceived usefulness	1. Using (an application) increases my productivity
	2. Using (an application) increases my job performance
	3. Using (an application) enhances my effectiveness on the job
	4. Overall, I find the (application) useful in my job

2.1.2: Task Technology Fit Model (TTF)

The other model of technology acceptance is task technology fit (TTF) model. This model suggests that technology adaptation depends on how well the new technology fits in with the requirements of a particular task. Goodhue and Thompson (1995) stated that task technology fit is a measure of the fit in between task and technology. As mentioned by Goodhue and Thompson (1995) TTF is the degree to which a technology aid to the individual in performing his/her collection of tasks. TTF model has four key constructs. Those are

-Task characteristics

-Technology characteristics

-Performance impact

-Utilization

Both task characteristics and technology characteristics together affect the task technology fit, which is the third construct and the outcome is a performance impact and utilization (Dishaw, Strong and Brandy, 2002). Goodhue and Thompson (1995) opined that task is actions that convert inputs into outputs. Also, the tools that used to carry out the task are called technology. Technology refers to hardware, software and data in information systems research.

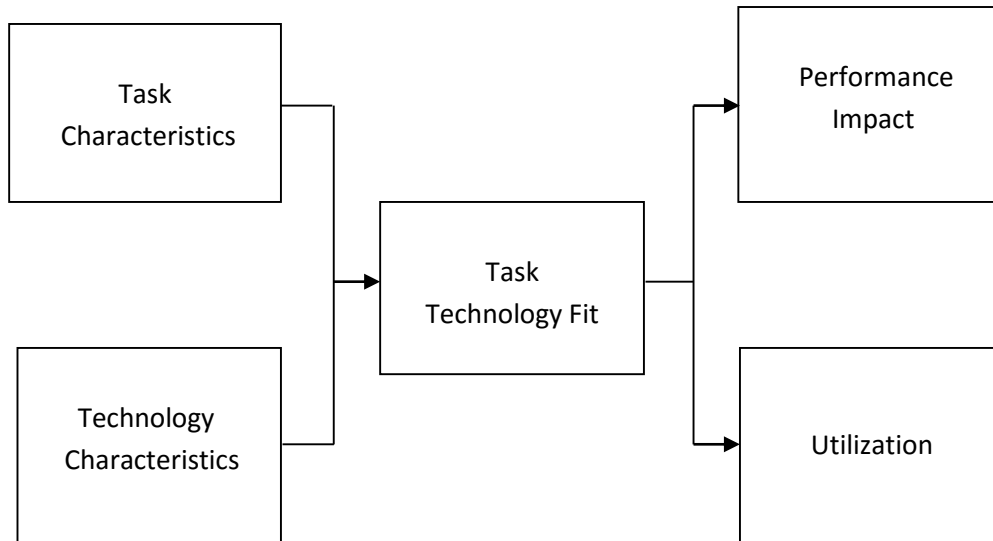


Figure 2. 3: Task Technology Fit Model (TTF) by Goodhue and Thompson (1995)

In work related task TTF is somewhat more effective than TAM model (Dishaw and Strong 1999). Furthermore, Dishaw and Strong (1999) opined that both TAM and TTF models develop and use to understand the users' evaluations and choices of IT and the outcome of these two models are actual use of IT or related variables.

2.3: IT systems used in banks

Banks are common using several types of IT systems. It is the results of deviating from traditional and more manual systems. When considering the public and private banks, all the systems are not the same. Because of the purpose and special kinds of services, the systems can be different. IT driven banking services (ITDBS) is considered as one of such potential IT application in the banking sector. Automated Teller Machines (ATM), online banking, mobile banking, telephone banking and internet payment gateway are some examples for IT driven banking services (Suraweera et al., 2011). In addition, Suraweera et al., (2011) stated that only less than 1% of bank customers in general use online banking, mobile banking, telephone banking and internet payment gateway. IT driven banking systems are mentioned below.

1. Automated Teller Machine (ATM) network

ATM is an electronic machine, operated by the customer himself to make deposits, withdrawals and other financial transactions with magnetically encoded plastic card and a code number. It is the one of the most popular ITDBS used by the customers. Suraweera et al., (2011) stated that as per the bank executives, ATM services are broadly used by customers. Over 80% of customers have ATM cards.

2. Point of Sales (POS) network

Point of Sales service is one of the innovative money transferring system. This system allows the customers to pay via their ATM/credit cards at any POS machine (Zaman and Chowdhury, 2012).

3. Core banking system

Core banking is the service provided by a group of networked bank branches. This allows for the bank customers do their banking activities in any of the branch offices (Zaman and Chowdhury, 2012)

4. SMS banking

SMS means Short Message Service. Through this ITDBS, customers permit to receive SMS alerts of the recent transactions to their mobile devices.

5. Mobile banking

Mobile banking is considered as one of the first commercial application of the mobile commerce (Barnes and Corbitt, 2003). Mobile banking allows to get the banking and financial services via mobile devices. To offer mobile banking service, the bank is in relationship with the cellular service providers offers this service.

6. Internet banking

Through the Internet banking customers will be able to perform a wide range of banking transactions electronically via the bank's Web site. In the early stages when internet banking first introduced, it was used mainly as an information presentation medium and by using their web sites, banks marketed their products and services (Tan and Teo, 2000).

7. Telephone banking

This type of ITDBS permits customers to carry out a transaction via land line telephones. Operator-attended and automated are the two types of telephone banking services. There is a difference from above mention two types. Operator-attended type does not provide 24 hour service, but automated telephone banking systems are available at any time (24*7) (Shaoyi et al., 1999).

2.4: Impact of ICT in banking sector

Dangolani, (2011) stated in banking Information Technology has basically been used under two different paths. The 1st one is Communication and Connectivity and the 2nd one is Business Process Reengineering. Tiwari and Kumar, (2012) opined that, the modern banks cannot depend on its branch network alone. Customers are now demanding on more convenient delivery systems and services such as internet banking. In addition, Tiwari and Kumar, (2012) opined that the banking system slowly converting from traditional banking towards relationship banking.

Lymperopoulos and Chaniotakis, (2004) pointed out that normally banks set their managers' responsibility for the promotion of the use of electronic channels to the customers. Dangolani, (2011) stated that ICT has a foremost impact on the way the banking and financial services are delivered. In addition, as a result of the development of technology, the banks pre-eminent in information are deteriorated. Owing to that, following mentioned incidents have taken place, and all these affect the more competitive market environment. Those incidents decline the entry barrier, new market competition has emerged and some financial products and services have become more transparent (Dangolani, 2011).

The rapid improvement of information technology permits, banking services become more and less paperwork and automated than in the past. Modern era, ICT has become the spirit of the banking industry. Meanwhile banking industry has become the heart of the economy. ICT development has a major effect to develop more user friendly and flexible banking services. Customer satisfaction and timely customer service delivery are the key parameters that the bank has to achieve (Aliyu and Tasmin, 2012). Furthermore Aliyu and Tamsin, 2012 stated that ICT has introduced new infrastructure to the world economy and electronic banking system become as a revolutionary technology in conducting financial transactions.

2.5: Interview based literature review

Primary interviews were done with five chief information officers (CIOs) in different banks in Sri Lanka. Those are categorized as licensed commercial banks and licensed specialized banks. Those selected five banks belong to three categories. Those are public (A and B), private (D and E) and global(C). The questionnaire was developed by using TAM and the questionnaire consists of 12 questions under the perceived ease of use, perceived usefulness and general categories. The answer of the given questions and conclusion of each question is as follows. Some text is given in the italic font to show actual words spoken by the CIOs. The actual purpose of doing this kind of primary interview is to select two suitable banks out of five banks to fulfill the primary and secondary research objectives.

Q1. According to your perception, how you feel about introducing ICT systems to your bank?

Table 2. 2: CIO's perception of Interview question 01

Bank	Observation
Bank A	<i>Very essential, nothing running without IT. Without IT won't be able to run the business and it is very critical.</i>
Bank B	<i>Essential, but there are many constraints against that.</i>
Bank C	<i>Not cost efficient, most of them are not easy to integrate with the legacy systems in use.</i>
Bank D	<i>Very essential, it is a critical factor of development in the banking sector. It is a must to introduce IT systems to the bank</i>
Bank E	<i>Very essential, you cannot survive without it, because customer volumes and customer expectations of service are increasing and today's society highly depends on social media. So cater those demands, it is essential</i>

Conclusion of question 01

Every bank is of opinion that it is essential to introduce IT systems to their bank and it is a critical factor to run a business and also they cannot survive without IT. But one of the public

banks and the global bank mentioned that there are many constraints like high cost and difficulty to integrate with legacy systems.

Q2. What type of idea do you have about your bank employee’s IT literacy level?

Table2. 3: CIO’s perception of Interview question 02

Bank	Observation
Bank A	<i>Somewhat better now. Because earlier average age was very high. Now new recruits are there, so that low literacy level percentage is very low</i>
Bank B	<i>They don’t have a good IT literacy level, because lack of ample training programs.</i>
Bank C	<i>The average IT literacy of all staff. However millennia’s have a better IT literacy.</i>
Bank D	<i>Good knowledge in IT and highly IT literate.</i>
Bank E	<i>Categorized it by gender wise. The younger generation has very high computer literacy level. But the older generation has lesser IT literacy level than the younger generations.</i>

Conclusion of question 02

Except one public bank, all the other banks stated that their employee’s IT literacy level is good and meets expectations. The younger generation has more IT literacy level than the older generation. Bank B mentioned that lack of training programs for their employees have caused lower IT literacy levels among their employees.

Q3. What are the strategies do you take to overcome the lack of literacy level of yours employees for newly implemented IT systems?

Table2. 4: CIO’s perception of Interview question 03

Bank	Observation
Bank A	<i>Almost everyone is using computers now. We are giving them a continuous training at the time of implementation and general awareness.</i>

Bank B	<i>Employees learn by doing. But lack of human resource in IT department is a great barrier for conducting training programs.</i>
Bank C	<i>On the job training and corporate training in standard IT software</i>
Bank D	<i>Train the employees, involving the user into the projects. Give some hand on training on the system before live environment.</i>
Bank E	<i>We put younger employees in the operational side and elder employees who have less IT literacy level for decision making process and supervising activities.</i>

Conclusion of question 03

Training programs are the main strategy to overcome the lack of IT literacy level of the employees and involving the user to the project implementation is the other best strategy. An interesting strategy followed by bank E, to overcome lack of literacy level. The strategy is they put younger employees in the operational side and elder employees who have less IT literacy level for decision making process and supervising activities. Bank B mentioned that, to conduct some training programs, there should be sufficient resource people in the IT department.

Q4. Do you find that, it is easy to get IT systems, to do what the employees want to do?

Table 2. 5: CIO's perception of Interview question 04

Bank	Observation
Bank A	<i>No, it is not easy. There are two things, system side and employee side. May be system not providing everything. On the employee side, they are reluctant to change and some resistance there.</i>
Bank B	<i>No, it is not easy. Lack of the domain knowledge of the division is a barrier. Internal development of the IT systems is the main obstacle.</i>
Bank C	<i>It depends on the IT systems, which 70% of the systems do have unnecessary functions and not easy to use.</i>
Bank D	<i>No, it is not easy, it happens because of the user not involving to the development of the project. The user should involve in the projects and it is the bank's policy.</i>
Bank E	<i>It depends on how we handle the system. If we cannot cater the user department's expectations and requirements that will occur.</i>

Conclusion of question 04

It is not easy to get IT systems to do what the employees want to do and it depends on the systems and also how users handle the systems. There are many reasons and barriers. Such as, reluctance to change, unnecessary functions of the systems and lack of the domain knowledge are the barriers.

Q5. Do you believe that learning and operating new ICT systems are easier for your employees than subsequent systems? Why?

Table 2. 6: CIO's perception of Interview question 05

Bank	Observation
Bank A	<i>That depends. If we implement new system we expect much bigger things from them. If the assistance and commitment of top management are there, it is not difficult.</i>
Bank B	<i>No. because of their low IT literacy level and Lack of training sessions is the main obstacle for that. But we believe it will be changed in coming years.</i>
Bank C	<i>No. systems should target the basic functionality and should be easy to use.</i>
Bank D	<i>That depends. There won't be any issue if the project is managed well. The gap in between the user requirements and functionality of the new system is the major issue for that.</i>
Bank E	<i>That depends; people are very reluctant to change. People like to be in their comfort zones. Initially there is a difficulty, but after a couple of weeks they get familiarize it.</i>

Conclusion of question 05

All the banks gave negative answers, and they mentioned that several impediments. Expecting much bigger things from employees and lack of IT literacy level of the users is the major impediments. Also not targeting the basic functionality is the other issue.

Q6. What are the prior investigations that you do about your employees, before introducing the new IT system?

Table2. 7: CIO's perception of Interview question 06

Bank	Observation
Bank A	<i>Firstly, the requirements. Then the system, IT literacy level and training requirements.</i>
Bank B	<i>No any prior investigations. The requirements are coming through the divisions and IT division is implemented that requirement into the system.</i>
Bank C	<i>IT literacy level, current usage and level of understanding of the IT systems.</i>
Bank D	<i>Firstly, user requirements and the usability of the system. And the system needs to be user friendly.</i>
Bank E	<i>IT literacy level, background study about the people, like who have the capability to handle those systems, who like to work with IT, who are reluctant.</i>

Conclusion of question 06

Most of the banks consider the employee's requirements and IT literacy level is the major investigations. Current usage, usability of the system, background study and training requirements are the other investigations. But one public bank (Bank B) mentioned that they do not conduct a prior investigation on the literacy level of the employees and but only consider the requirements.

Q7. What are the challenges you and your IT team have to face while implementing the IT systems?

Table2. 8: CIO's perception of Interview question 07

Bank	Observation
Bank A	<i>User awareness, user acceptance and educating them for what the bank is going to achieve.</i>
Bank B	<i>Lack of top management support, Lack of sufficient staff, being a government bank (lengthy Procedures).</i>
Bank C	<i>Time constraints, compatibility with the legacy systems and processing.</i>
Bank D	<i>Those are there. The main challenge is time constraints. A small portion of employees is reluctant to change.</i>

Bank E	<i>Reluctant to change, meet the deadlines, meet up the budgets, requirement gets changed during the implementation and government tax.</i>
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Conclusion of question 07

There are several types of challenges that the IT team has to face while implementing the IT systems. The time constraint is the common challenge and user awareness, compatibility issues with the legacy systems reluctant to change of the employees are the other common challenges. But there is a controversial answer given by one public bank. That is, being a government bank is a challenge that their IT team has to face while implementing the IT systems. Because they have to follow lengthy procedures (IT procurement) while implementing the IT systems

Q8. After implementing the systems, do you evaluate the opinions and a complaint of the employees who are using it?

Table 2. 9: CIO’s perception of Interview question 08

Bank	Observation
Bank A	<i>Yes, have some trials before implementation. IT department receives opinions from the users, after implementing the systems.</i>
Bank B	<i>Yes, normally that happens.</i>
Bank C	<i>Yes, this is done regularly.</i>
Bank D	<i>Yes, definitely.</i>
Bank E	<i>Yes, definitely.</i>

Conclusion of question 08

Each and every bank evaluate the opinions and complaints of the users

Q9.What are the most common complaints and opinions about the newly implemented systems?

Table2. 10: CIO’s perception of Interview question 09

Bank	Observation
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Bank A	<i>The vendor is not providing the things that they expected, expectation gaps, do not understand some parts clearly</i>
Bank B	<i>Training and awareness is not enough, functional problems.</i>
Bank C	<i>Not able to do the tasks easily, unnecessary functionality and unnecessary steps included to the basic works.</i>
Bank D	<i>The mismatches of the systems, functional problems.</i>
Bank E	<i>User expectation gaps, vendor support while implementing the systems, inadequate training.</i>

Conclusion of question 09

Expectation gaps, lack of training and awareness, unnecessary functionality and unnecessary steps included to the day to day task are the most common complaints that the users raise to the IT department. Public banks mentioned that, lack of training and awareness programs are the one of the most common complaints that their employees have.

Q10. How does your IT team respond to those complaints?

Table 2. 11: CIO's perception of Interview question 10

Bank	Observation
Bank A	<i>First, we evaluate the complaints. If it is a genuine problem, then we address them by keeping continuous communication with the users</i>
Bank B	<i>Evaluate the complaints and attending it on the spot.</i>
Bank C	<i>Most of the times in positive manner and make face to face discussions with complainers</i>
Bank D	<i>We are maintaining a live issue list and that is categorized and prioritized as high, medium and low. Then we follow-up the issues.</i>
Bank E	<i>We introduced an issue tracker and we categorized and prioritized those complaints as high, medium and low and we attend to the complaints immediately according to the categorization.</i>

Conclusion of question 10

All the banks attend to the complaints after evaluating those. One private bank has a live issue list and that list is categorized and prioritized as high, medium and low. Which is the best

method by comparing other methods and no any other bank do like that. Prioritization is very essential, because the IT department can attend the most critical and highly impact issue early without getting much damage to the entire banking system.

**Q11. Do you believe that ICT systems enhance the employee’s performance?
What are the indicators for that?**

Table 2. 12: CIO’s perception of Interview question 11

Bank	Observation
Bank A	<i>Yes. We use the IT systems to simplify the task and improve the performance. Customer complaints and other department complaints are the indicators for that.</i>
Bank B	<i>Yes, We believe in it. But we have not any indicators and we haven’t practiced it.</i>
Bank C	<i>Yes. The aim of implementing IT systems is to enhance the performances of the tasks. Numbers of customer complaints and overtime hours of the employees</i>
Bank D	<i>Yes, definitely. Number of transactions processed at a given time and numbers of mistakes we have reduced. We have a benchmarking mechanism.</i>
Bank E	<i>Yes, by the business volumes, user productivity improvement and also numbers of customer complaints and overtime hours of the employees</i>

Conclusion of question 11

Implementing the IT systems enhance employee’s performance. Customer complaints, department wise complaints, a number of mistakes, numbers of the transaction process and overtime working hours are the major indicators for measuring employee performances. Using indicators and measure the employee performances are the most common methods that everyone is practicing present days, but it is unbelievable that one of the public banks in Sri Lanka is not practicing such a kind of system.

Q12. How do you measure the employee’s productivity, after implementing the ICT systems into your bank?

Table2. 13: CIO’s perception of Interview question 12

Bank	Observation
Bank A	<i>Yes. We look at them. But it depends on the systems. We measure the overall productivity and efficiency of the entire department and each of the individuals.</i>
Bank B	<i>There may be some methods, but we are not aware of it and there is no any system like that</i>
Bank C	<i>Measurements depended on the system. If it is a direct impact to the workflow, it can be checked by numbers of task done during the month and be able to get statistics using quality metrics.</i>
Bank D	<i>We only measure performance, but not the productivity. We believe that productivity is not related to the systems.</i>
Bank E	<i>Measure the overall productivity of entire users and user department in every month.</i>

Conclusion of question 12

According to the CIO’s perception the productivity depends on the systems. Only two banks (A and E) measure the productivity of their employees. Other banks are not practicing any method to measure the productivity of their employees.

CHAPTER 3: Research Design and Methodology

3.1: Models used for research

This research is based on Technology acceptance (TAM) model and Task technology fit (TTF) model. In TAM model two cognitive beliefs were considered. Those were perceived usefulness and perceived ease of use. In TTF model, main independent factors for technology fit are technology characteristics and task characteristics. Performance impact and utilization are the dependent factors for technology fit.

3.1.1: Model Diagrams

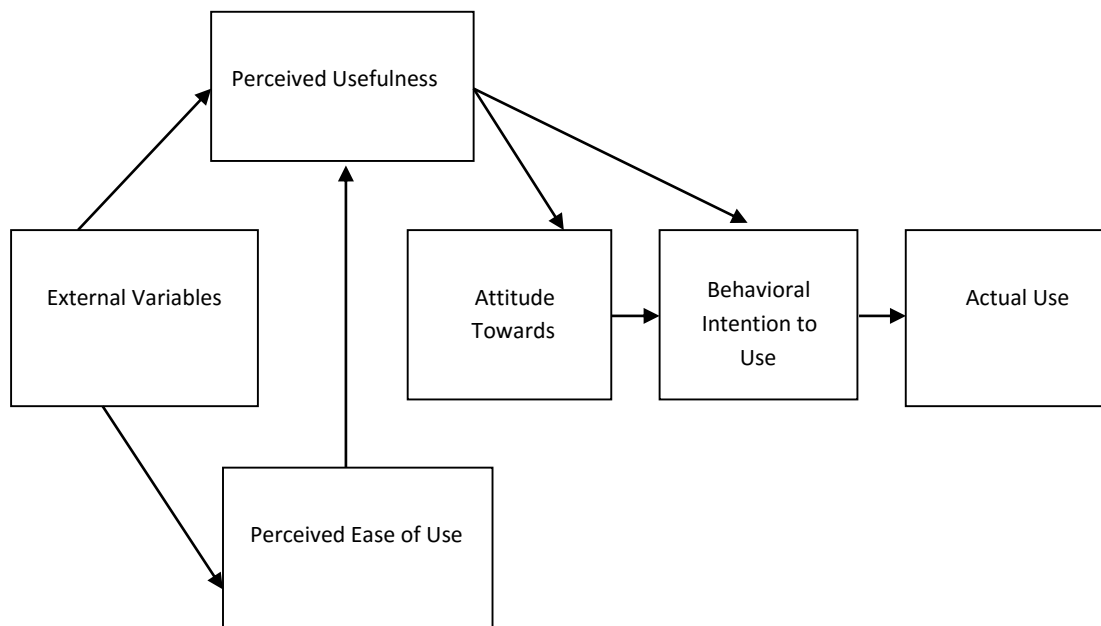


Figure3. 1: Original Technology Acceptance Model (TAM) by Davis et.al. (1989)

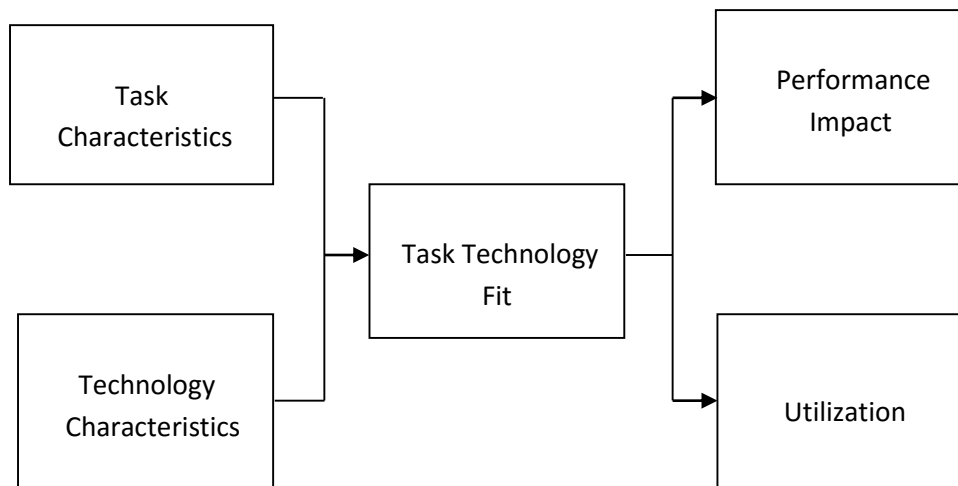


Figure3. 2: Task Technology Fit Model (TTF) by Goodhue and Thompson (1995)

3.2: Population selection

The Central Bank of Sri Lanka categorized financial institutes into three different categories according to their functions and their objectives. Those categories are licensed commercial banks, licensed specialized banks and licensed financial companies. According to the Central Bank of Sri Lanka there are 25 licensed commercial banks, 7 licensed specialized banks and 47 licensed financial companies. For the initial study (semi structured interviews with CIOs) above mentioned 25 licensed commercial banks, five banks were selected and out of above mentioned seven licensed specialized banks, one bank was selected. Those selected licensed commercial banks and one licensed specialized bank belongs to three categories. Those are global, public and private. For above five banks two banks were selected from public sector and two banks from private sector and one bank from global sector.

For further exploratory study two public banks were selected. Those two banks were selected after analyzing the primary data gathering from the primary interviews of the CIOs from each of above mentioned five banks. The reason for selecting the two banks from the same category is to facilitate the comparison of impact on the performance under homogeneous conditions. The selected two banks, one bank is the largest public bank in Sri Lanka and have the highest reputation in the banking sector and with a high Brand value. The Bank provides diversified Retail, Wholesale, International, Development/ Investment Banking, Services, Credit, Credit Cards, SLIPS, Safe Deposit and pawn break-in services. The other bank that was selected from

the public sector is the third largest public bank in Sri Lanka and its operations mainly belonging to savings.

3.3: Questionnaire design and development

Banking employees are fluent in English language. Hence, the English questionnaire is designed and considered as the original questionnaire. For the selection purposes of the two banks out of five banks to conduct a future exploratory study, initial questionnaire was used and it consisted with 12 questions based on two cognitive beliefs of TAM, named as perceived usefulness and perceived ease of use. Some general questions were also included in it. The basic idea of development of this type of questionnaire is to identify the actual level of IT system usage in the selected banks and the questionnaire was developed to see whether the banks consider perceived usefulness and perceived ease of use and what are the challenges they have to face while implementing the ICT systems to their users. . The categories and the related numbers of questions of the above mentioned questionnaire is mentioned below diagram.

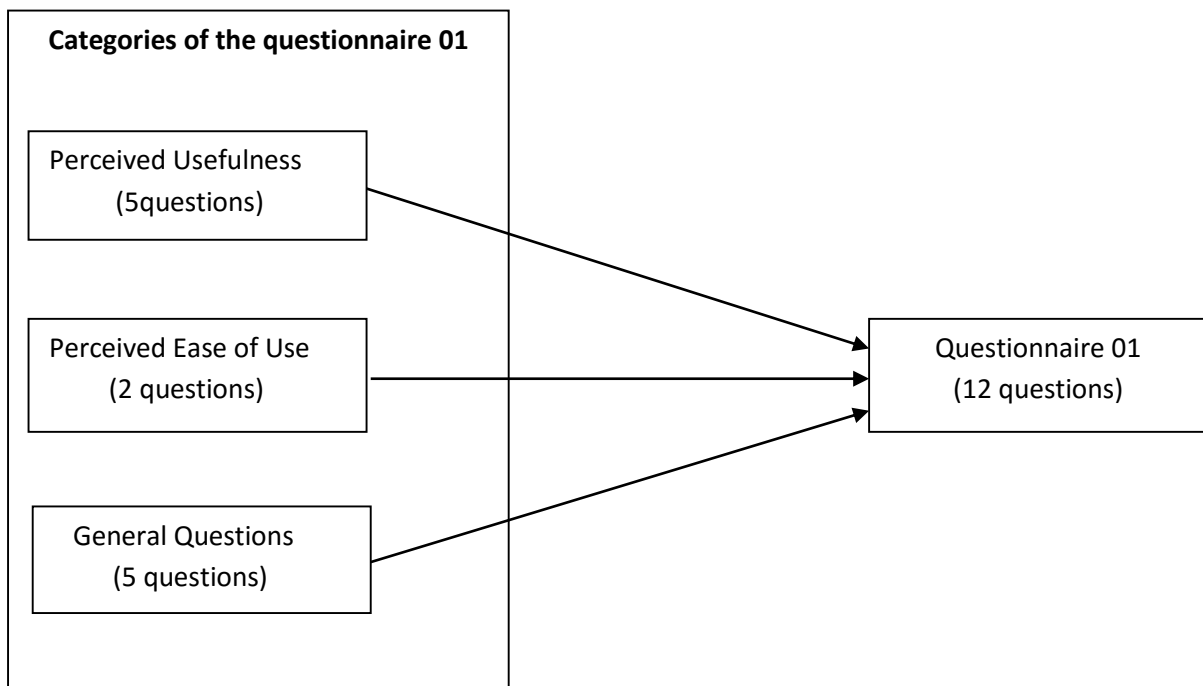


Figure3. 3: Categories of questionnaire 01

For further details of the questionnaire 01, is mentioned in the appendix 01.

After gathering the data and selected the two banks for the future exploratory study, the second questionnaire was developed. This questionnaire was also in the English language and the

differences with the first questionnaire were it had higher numbers of questions covering wide area and relatively more question categories than the first questionnaire. This questionnaire was aimed at both Manager Levels (including CIOs) and IT Staff Level employees. The categories of the questionnaire were Perceived usefulness, perceived ease of use from the TAM model; Task characteristics, technology characteristics of TTF model; general questions (educational and professional) and future planning related questions.

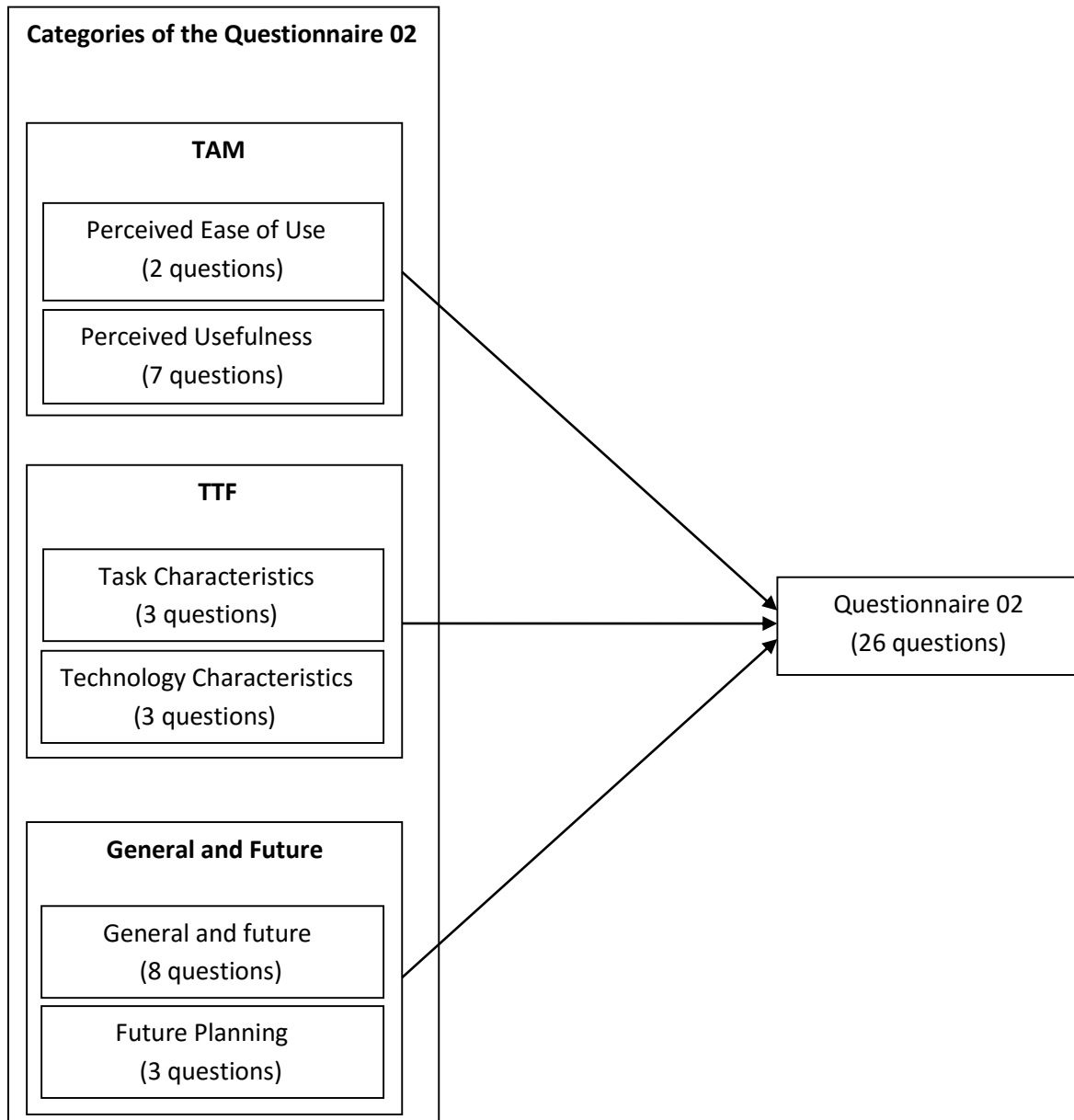


Figure3. 4: Categories of questionnaire 02

For further details of the questionnaire 01, is mentioned in the appendix 02.

3.4: Methodology for IT system implementation level employees

From the selected two public banks, 40 employees were selected (20 employees from each). Those were selected employees from each bank were categorized as follows. CIOs/Heads of IT (01 employee), senior management employees (01 employees) IT staff level employees (18 employees)

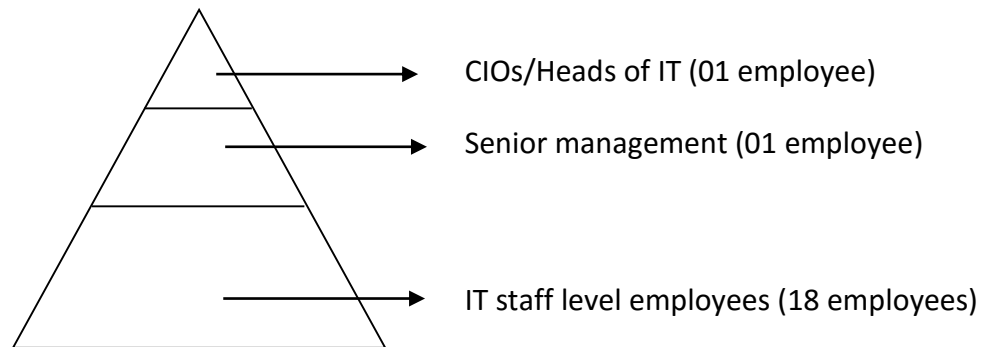


Figure 3. 5 : Employee hierarchy and selected number of employees

Those selected interviewees were interviewed by conducting qualitative semi-structured interviews. Interviews provide the approach of generating data by discussing people what they do on a daily basis (Miller and Brewer, 2003). Two Chief Information Officers (CIOs) or heads of IT, two senior management level employees and 36 IT staff level employees (probably as focus groups) were interviewed, In order to achieve the objectives of the research. IT systems users in the banks were not selected for the interviews. Since, the primary objective of the research is to find out the critical success factors (CSF) related to employee skills and perceptions for ICT implementation in the banking sector. The implementation process belongs to the management levels of employees and IT staff levels of employees.

Prior to the interview process, a brief introduction and the real objective of the research were given to the respective authorities of the selected banks. Then the interviews were carried out as one interviewee at one time method. It is expected that these interviews would yield answers and open comments from above mentioned different levels of employees. While the interviews were going on important facts and were written down on a separate paper under the number of the interviewee and meanwhile all the comments were recorded by using a portable recording device. At the end of the interview series all the data were summarized in an excel sheet under

interviewee number and the interview questions for the data analysis by using written documents and portable recording device.

3.4: Methodology for IT systems user level employees

After gathering data from IT systems implementation employees, 3rd questionnaire (Appendix 3) was developed. This questionnaire is used to gather data from IT system user level employees (Permanent bank employees who use the implemented systems at the branches) from selected two banks. The objectives of this questionnaire is to identify,

- The IT system user level employees' perceptions about the current working IT systems.
- The perceptions about the new IT systems which were implemented by the IT department.
- What kind of challenges/issues that the IT system user level employees have to face.
- What type of support the IT department offers to the user level employees.
- The IT system users, perception about their IT department.
- The effectiveness/usefulness of the training programs conducted by the IT department.

From the selected two banks (Bank A and Bank B), 24 user level employees were interviewed. Out of 24 employees, 12 user level employees from each bank. In the interview process, above mentioned 12 employees were not selected from one branch. Instead, they were selected from differently located branches. Those selected user level employees belong to several sections of each branch, such as, Loan Section, Pawning Section, Front Office and Counter Section. Furthermore, interviewed employees belonged to different levels of their career, such as, Assistant Managers, Executive Officers, Junior Executive Officer and Bank Assistant. At the end of the interview series, all the data were summarized in an excel sheet under interviewee number and the interview questions for the data analysis by using written documents and portable recording device.

3.4: Summary diagram of the research methodology

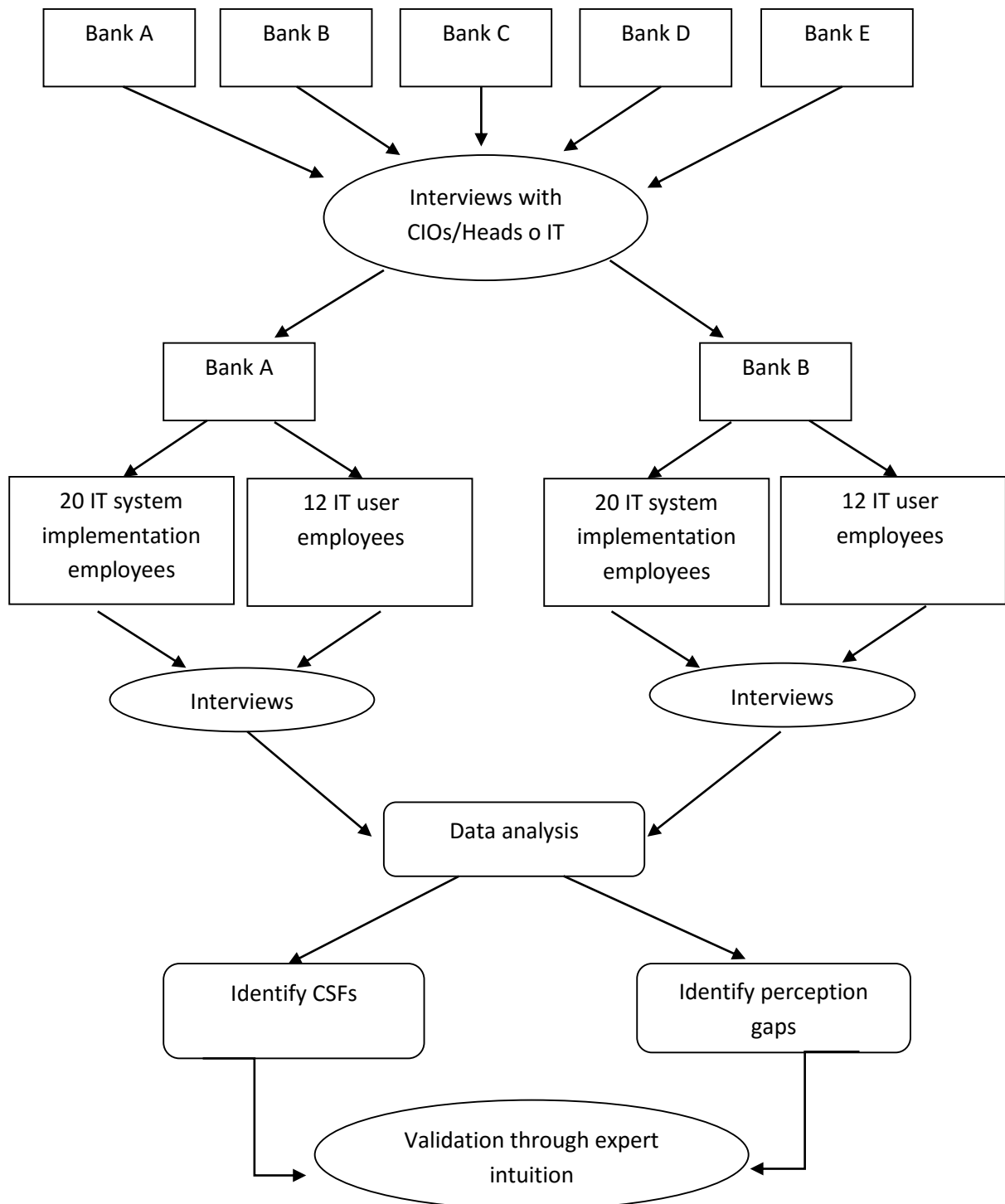


Figure 3. 6: Summary diagram of the research methodology

CHAPTER 4: Data Analysis

Bank A is a large public bank in Sri Lanka with a widely spread banking network and providing IT based services to all the branches.

Bank B is a public bank in Sri Lanka, strategically established to enhance the savings. It has comparatively less amount of branches than Bank A.

4.1. Data analysis for IT systems implementation level employees

The gathered data was analyzed to get the better understanding of how it affected to the research objectives.

4.1.1. General questions (demographic and educational)

01. What is your age group?

Bank A

Table 4. 1: Age groups of the interviewees (Bank A)

(55+)	3
(45-54)	2
(35-44)	1
(25-34)	14

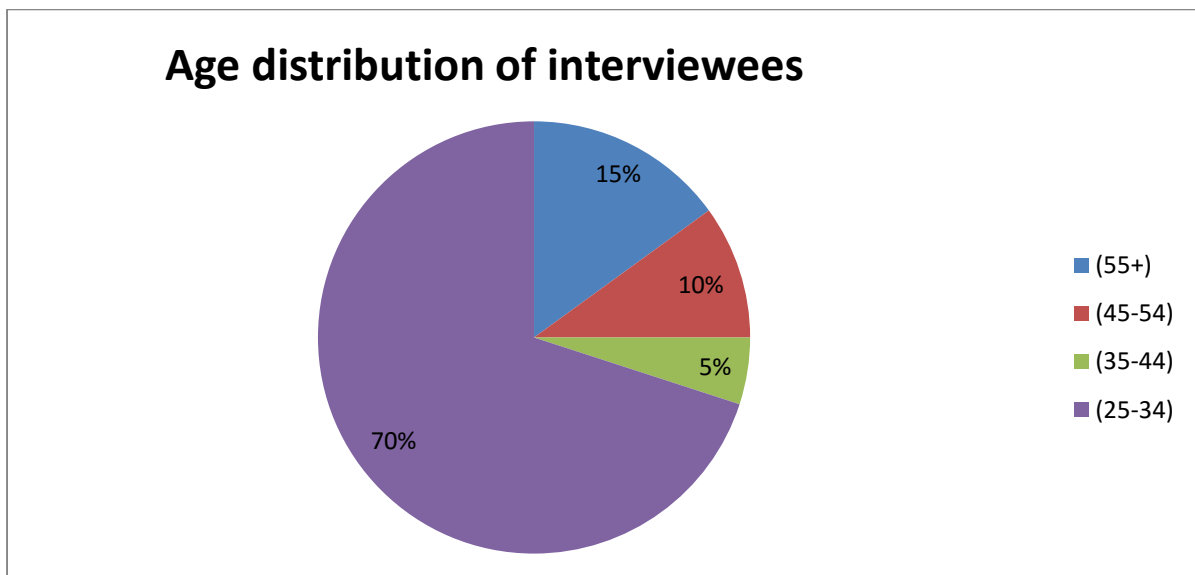


Figure 4. 1: Age groups of the interviewees (Bank A)

Bank B

Table4. 2: Age groups of the interviewees (Bank B)

(55+)	2
(45-54)	6
(35-44)	4
(25-34)	8

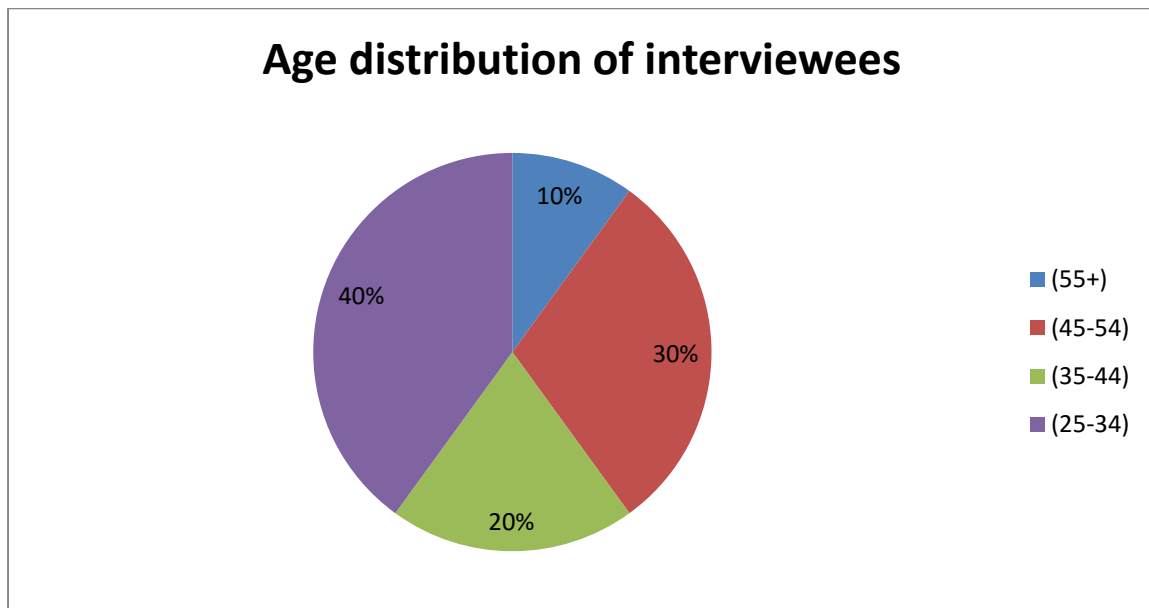


Figure4. 2: Age groups of the interviewees (Bank B)

02. What are your qualifications you have achieved in IT field?

Bank A

Table4. 3: IT qualification levels of the interviewees (Bank A)

BSc.	11
BSc. /MSc.	2
PG. Diploma	2
Other	2
BSc. /PG. Diploma	2
BSc. /MSc. /MBA	1
BSc. /MBA	0

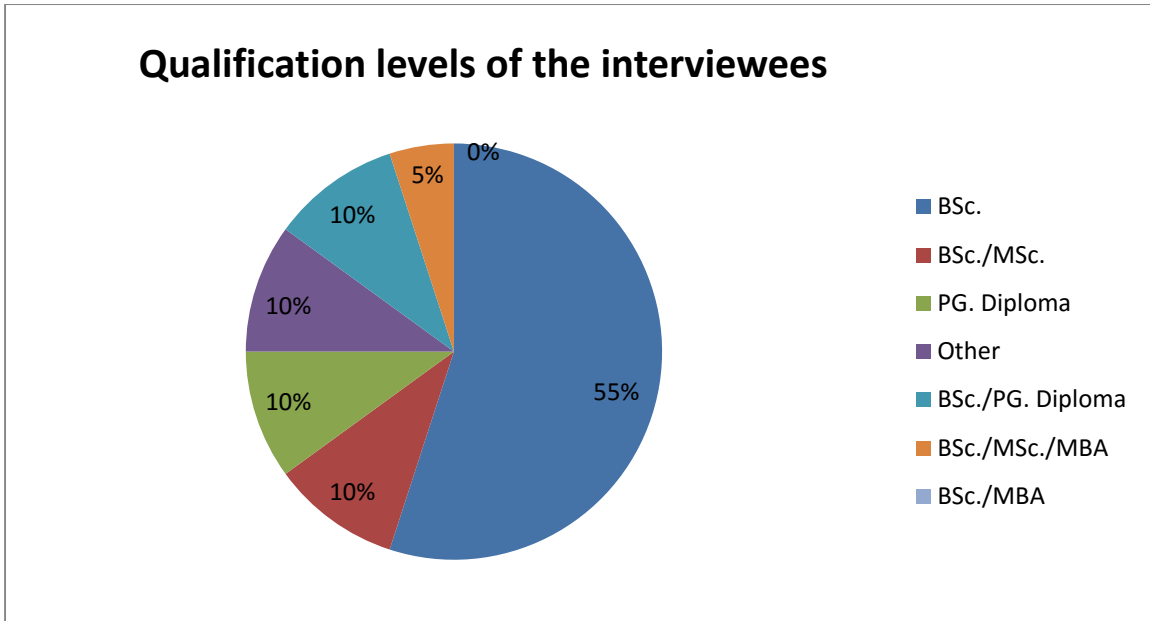


Figure4. 3: IT qualification levels of the interviewees (Bank A)

Bank B

Table4. 4: IT qualification levels of the interviewees (Bank B)

BSc.	5
BSc./MSc.	11
PG. Diploma	1
Other	1
BSc./PG. Diploma	0
BSc./MSc./MBA	1
BSc./MBA	1

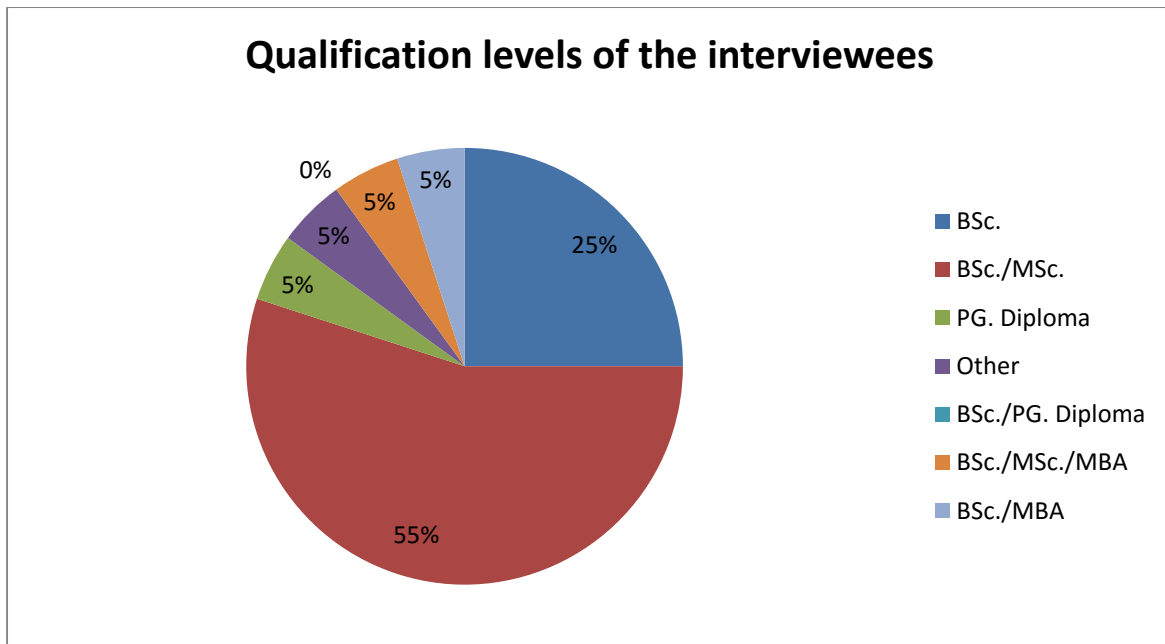


Figure 4. 4: IT qualification levels of the interviewees (Bank B)

03. Is it important to investigate IT knowledge/related skills, before introducing the new IT systems?

Bank A

95% of employees believed that investigating the IT knowledge and related skills before introducing IT systems is extremely essential and important. By this, the bank could obtain a proper and accurate understanding of the current knowledge and skill levels of the employees. In addition, to that they stated it directly helps to handle the system smoothly and enable to make some judgments and insights about the knowledge and related skills beforehand. The majority of the employees stated that, if the bank practice this, the bank will be gained benefits such as take early directions for shortage of related IT skills could be observed beforehand. Reduce operational and maintenance issues, can give better output and assign the right person to the right job and users will be able to reap the full benefits of the new systems. Out of 19 employees one employee stated that it is required, but not a deeper investigation is not required. Only one employee out of 20 employees stated that IT employees can grasp the required knowledge if timely training is provided. Further, they stated that they can get the knowledge by research and development.

Bank B

All the employees believe that investigating the IT knowledge and related skills before introducing IT systems is very essential and important. Furthermore, they mentioned that Bank can gain more advantages by practicing this system. It permits to put the right person, into the right team and assign to the right task and get the idea about the level of training requirements that the employees are needed, plan the implementation activities, identify the pitfalls beforehand. Some employees opined that it helps to get understand the actual situation of the employees' knowledge and related skill levels and its direct support to carry out the implementation process in a smooth manner.

4.1.2. General questions (profession)

4. Do your superiors investigate IT knowledge/related skills of employees?

Bank A

Table 4. 5: Interviewees perception about their superiors' investigation of employees' IT knowledge/related skills (Bank A)

Yes	11
No	5
Sometimes	4

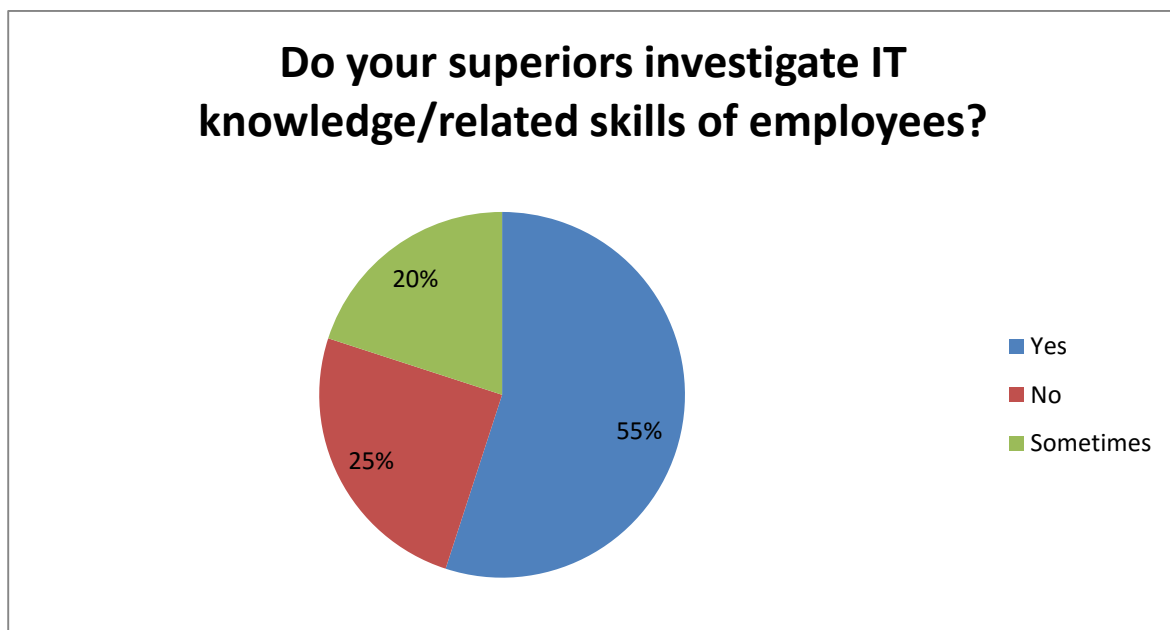


Figure4. 5: Interviewees perception about their superiors' investigation of employees' IT knowledge/related skills (Bank A)

Five employees out of 20 employees (25%) directly pointed out that their Superiors do not investigate their IT knowledge and it is important to investigate those skills before implemented the new IT systems. But The Senior Management Employees opined that Yes, most of the times. But it depends according to the systems. If there is a mandatory system they need to implement, but employees haven't sufficient skills, despite the knowledge or skills they implement it. Further, they mentioned that according to the IT road map superiors investigate levels of IT knowledge and related skills of the employees and arrange training and development programs.

Bank B

Table 4. 6: Interviewees perception about their superiors' investigation of employees' IT knowledge/related skills (Bank B)

Yes	8
No	11
Sometimes	1



Figure4. 6: Interviewees perception about their superiors' investigation of employees' IT knowledge/related skills (Bank B)

55% of the employees directly pointed out that their superiors do not investigate their IT knowledge and it is important to investigate those skills before implemented the new IT systems. But Senior Management Employees stated that they do not investigate their employees' knowledge and related skills, but they facilitate by providing the sufficient training programs for them. Meanwhile, 40% of employees declared that their superiors investigate their knowledge and skills. One employee stated that their top managers give them the requirements and according to that they develop the systems without investigating the knowledge/skills and the ease of use of the systems

5. Have you faced any challenges while adopting the new IT systems?

Bank A

Tabl 4. 7: Interviewees perception about the challenges while adopting the new IT systems (Bank A)

Yes	14
No	6

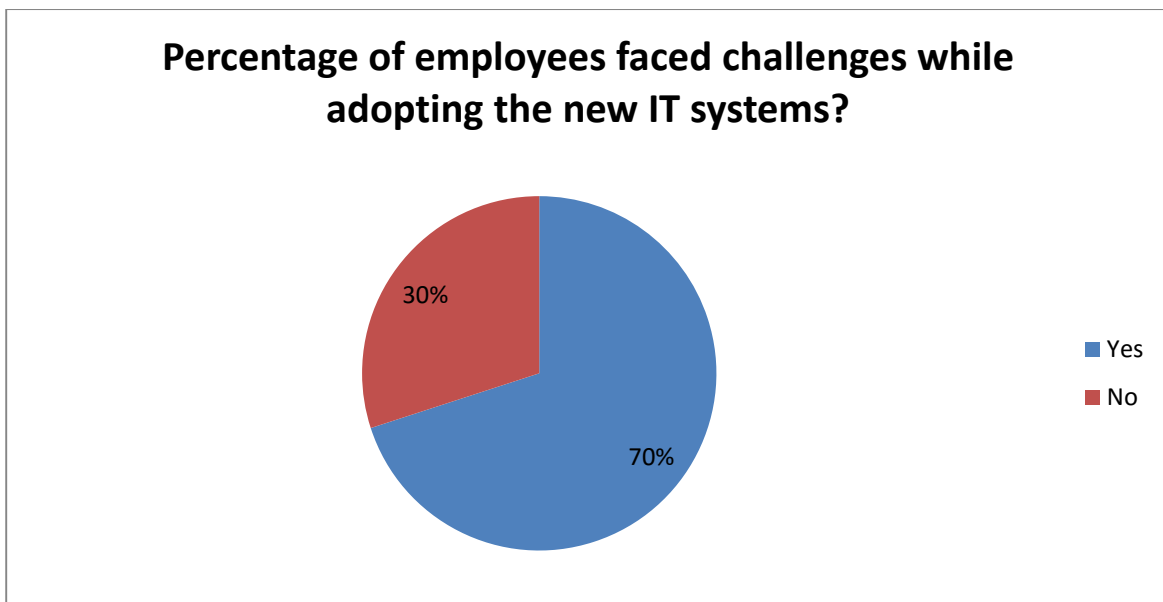


Figure4. 7 : Percentage of challenges faced by employees while adapting the new IT systems (Bank A)

70% of employees had faced the challenges while adapting to the new IT systems. One employee mentioned that he/she has faced challenges, but it depends on how she/he identifies the system before implemented it.

Bank B

Table 4. 8: Interviewees perception about the challenges while adopting the new IT systems (Bank B)

Yes	17
No	3

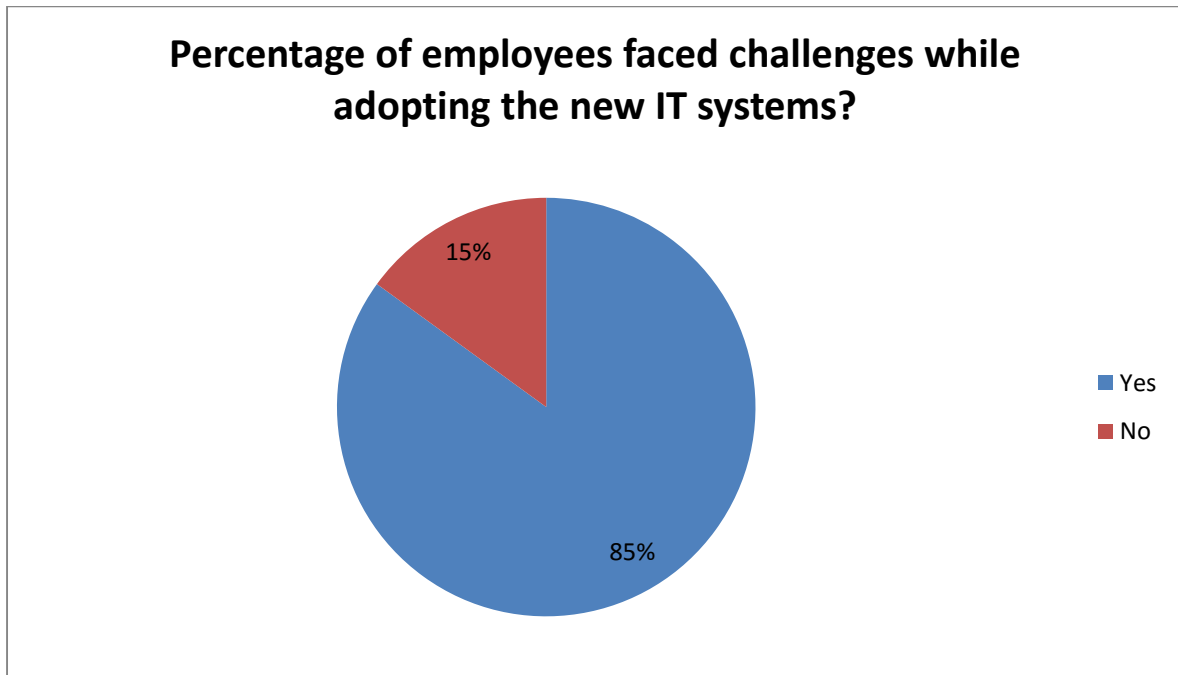


Figure 4. 8 : Percentage of challenges faced by employees while adapting the new IT systems (Bank B)

The majority of the employees (85%) has faced the challenges while adapting to the new IT systems.

6. What are those challenges/ how did you overcome those challenges (while adopting the new IT systems)?

Bank A

The Senior Management Employees stated that their challenges as employees reluctant to change from the comfort zone, lack of technical staff, user awareness and the time constraint, implement the system to entire bank network, reluctant to change. To overcome this, they mentioned that always keep informing the employees the bank targets and goals and what the bank is going to achieve and arrange training and development programs and educating the employees. The IT staff employees mentioned that operational issues, Setting up the necessary infrastructure, performance issues, operations and scheduling issues, interfacing with other systems, setting up system parameters, User training, customization, Non availability of data required by the new system, Knowledge not up to date and less knowledge regarding the new system. By participating in training and development programs, seminars and self-learning are the key areas to overcome the challenges

Bank B

The Senior Management Employees stated that their challenges of Lack of technical staff, lack of a core banking system, data migration issues and employee reluctant to change the from their comfort zones. To overcome those challenges, they mentioned that Keep better communication with the employees and providing regular training sessions where it's necessary. But IT staff employees mentioned that compatibility issues, server version changing issues and lack of domain knowledge issues, lack of business knowledge and environmental challenges such as getting authorization are their challenges. Furthermore, they pointed out that by participating in training and development programs, seminars and self-learning are the key areas to overcome those challenges

7. Do you plan to change your career path in the future?

Bank A

Table 4. 9: Details of interviewees' plans to change the career path in the future (Bank A)

Age Group	Yes	No
(55+)	0	3
(45-54)	1	1
(35-44)	1	0
(25-34)	8	6

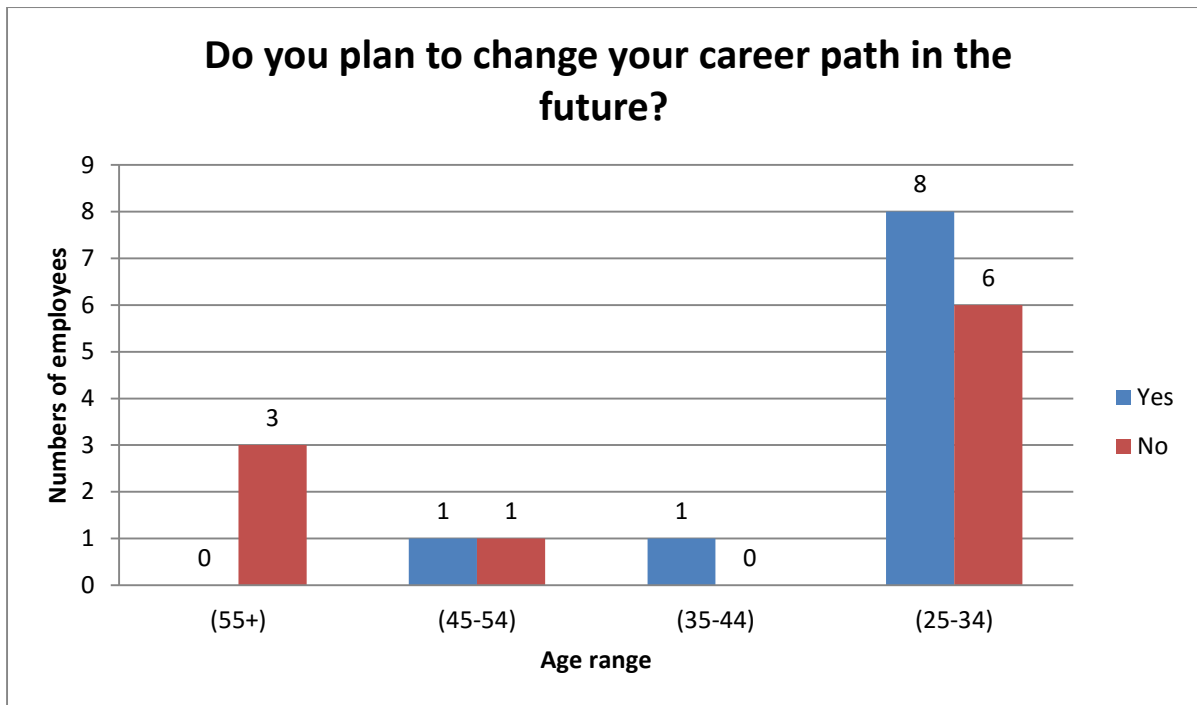


Figure4. 9: Details of interviewees' plans to change the career path in the future (Bank A)

The Senior Management employees and 55+ age category employees haven't any plan to change their career path and 8 employees belongs to (25-34) age category hope to change their career path in the future. It represents a 57.14% of overall (25-34) age categories. They hope to change their career path in project management and IT security area.

Bank B

Table4. 10: Details of interviewees' plans to change the career path in the future (Bank B)

Age Group	Yes	No
(55+)	0	2
(45-54)	2	4
(35-44)	1	3
(25-34)	5	3

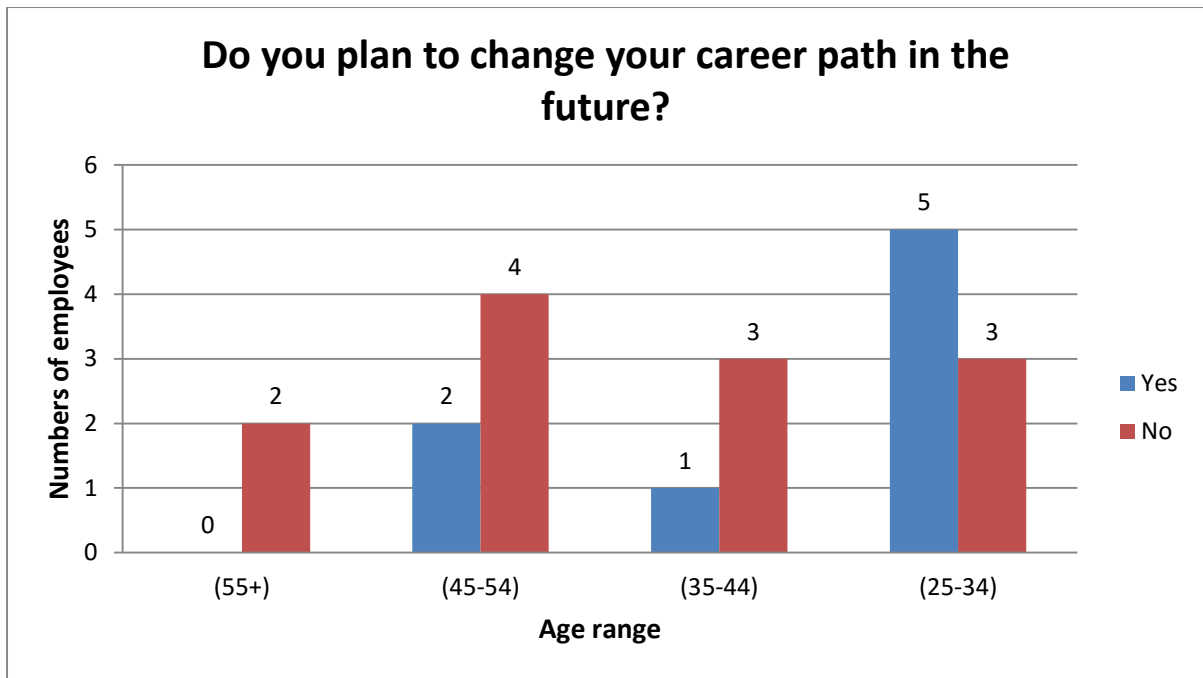


Figure 4. 10: Details of interviewees' plans to change the career path in the future (Bank B)

The Senior Management Employees and 55+ age category employees haven't any plan to change their career path and 62.5% of employees belong to (25-34) age category hope to change their career path in the future. 66.67% of employees belongs to (45-54) age category do not change their career path. Only 25% of (35-44) age category employees hope to change their career path.

8. What is your future plans related to your IT skills enhancement?

Bank A

95% of employees have plans to enhance their skills such as participating in training sessions, awareness programs, conducting their higher studies such as MSc. And MBA, doing more self-learning to gather new technologies and concepts. Even age level belongs to 55+ category employees also have future plans to enhance their IT skills because of the volatility of the IT field.

Bank B

All the employees have plans to enhance their skills such as participating in training sessions, awareness programs, conducting their higher studies such as MSc. concentrate into IT security, IT project management and academic field. Some employees stated that doing more self-

learning to gather new technologies and concepts as their future plans. Even age level belongs to 55+ category employees also have future plans to enhance their IT skills because of the volatility of the IT field.

4.1.3. TAM related questions

9. Is there any process to evaluate the opinion and complaints about the new System? /10. What is that evaluating process?

Bank A

All the employees stated that there is no any standard process to evaluate the opinions and complaints about the new system. Some IT staff employees mentioned that there is a system, but that is not a standard system and it is also not practicing well by now. But one of the senior management employees has pointed out that there is a kind of process which only belongs to the large systems.

Bank B

Table 4. 11: Interviewees' perception about the process to evaluate the opinion and complaints about the new System (Bank B)

Yes	5
No	15

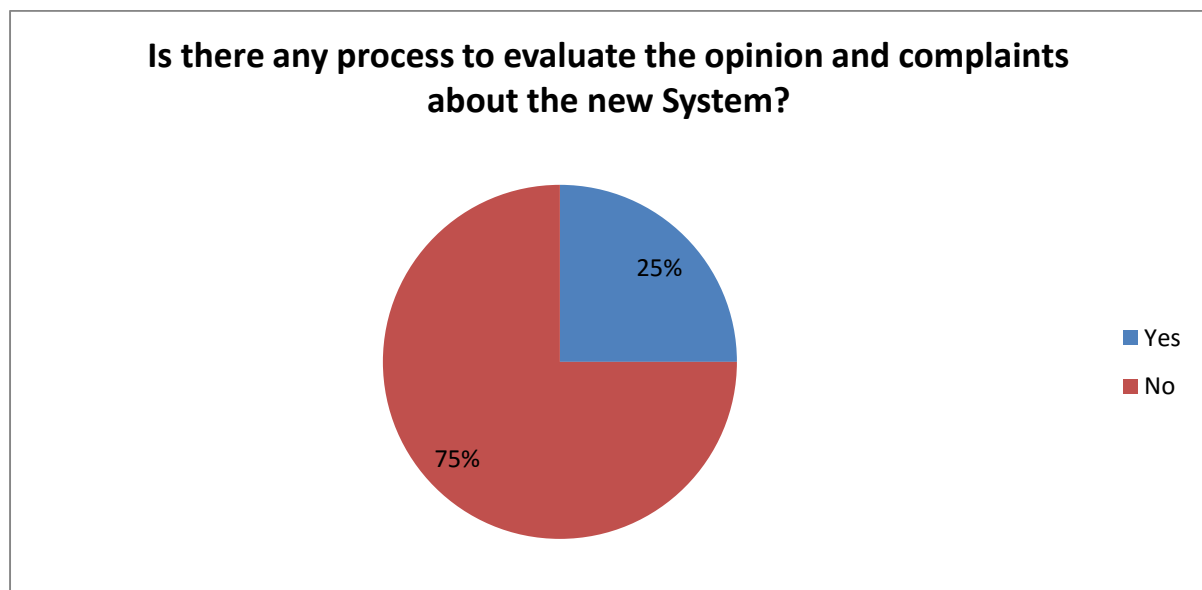


Figure 4. 11: Interviewees' perception about the process to evaluate the opinion and complaints about the new System (Bank B)

75% of employees, including Senior Management Level stated that there is no any standard process to evaluate the opinion and complaints about the new system. Only 25% of employees mentioned that there are some systems such as error tracking and incident report system, user acceptance testing (UAT) or follow the quality assurance system.

11. What are your/employees' most common complaints and opinions about new systems?

Bank A

75% of employees pointed out that lack of business domain knowledge, lack of operational knowledge and lack of user friendliness are their most common complaints about the new system. There are some other complaints about the new systems too. Those are, unnecessary delays of the systems, long transaction time of the new systems, Struggling with security aspects, users totally depend on the s/w and try to get the entire thing done automatically, complexity and mainly adapting issues, Lack of vendor support, Vendor's culture is not matching with the bank culture and customization issues of the new system.

Bank B

50% of total employees opined that lack of business domain knowledge, lack of operational knowledge is their most common complaints about the new system. There are some other complaints about the new systems too. Those are, adaptability issues, security issues, lack of user friendliness, user skills related problems, compatibility issues, System slow down, high level of network problems, software are not updated well, lack of hardware facilities, some hardware is not implemented well, limitations of the resources, errors in data and duplication of the data. The top management level employees and some staff level employees pointed out that stuck in a decentralized system without move to the core banking system as their main complaint.

12. How your IT team responds to those complaints raised by yourself or employees?

Bank A

Though there is no any proper process to evaluate the complaints raised by the employees, IT department somehow takes some action to respond to the complaints. As per the employees, IT team makes several rounds of discussions about the complaints and responds to it. If it is vendor base system, after having discussions with the vendor responds to the complaints. Two

employees from the senior management level has stated that there is a change request form and via that form IT team respond to the complaints. But rest of other 18 IT staff employees, only three employees mentioned about the change request forms.

Bank B

As per the 75% of employee opinion, the bank hasn't any proper process to evaluate the complaints raised by the employees. IT department somehow takes some action to respond to the complaints. As per the employees, IT team makes several rounds of discussions about the complaints and responds to it. Furthermore, they respond and take some actions to the complaints, according to the nature of the complaints. As an example, if the complaints are about the high level of networking problems, they monitor the network performances continuously. If there is any adaptability issue complaint, they arrange some suitable training sessions for the related employees. Two employees from the senior management level and five employees from IT staff level have stated that there is a change request form and via that form IT team respond to the complaints. One senior manager pointed out that, if they want any additional support, they request that from the local expertise.

13. Do you believe that IT systems enhance your/employee's performance? If yes, How? If no, Why?

Bank A

All the employees, including Senior Management, directly stated that IT systems enhance their and their employees' performance. Those are; current data amount cannot handle without IT systems, If it handled by manual systems, it would take high amount of time and manpower; just a one click, employees can evaluate all the details (credit card balance, loans, etc.) about the customers without wasting much time; It enhances the Speed, accuracy and ease of use; IT systems enhance the efficiency of the users; it helps to avoid duplication of data and instant availability of data. One employee argued that, if the new system resist to enhance the performance of the employees, that system is useless.

Bank B

All the employees, including Senior Management, directly stated that IT systems enhance their and their employees' performance. They pointed out below ways it enhances the performance. Those are, the new systems provide new technology and better service than past systems by the means of speed and accuracy, by the time wisely and ease of use of the customer it enhances

the performance, it helps to reduce the workload and manual intervention, so that it minimizes the human errors and increase the speed of transactions. One staff level employee stated that with the reliable and new technology, there is always the capacity to expand.

14. Do you feel that your productivity is increasing while working with new IT systems?

Bank A

All the employees stated that, they feel their productivity is increasing while working with new IT systems. Two employees mentioned that it depends on the system. By the way, one employee stated that if the new system cannot increase the employee's productivity, that system is useless according to the productivity wise. To get high productivity, it is essential to familiarize with the system well.

Bank B

Table4. 12: Interviewees' perception about the productivity, while working with new IT systems (Bank B)

Yes	19
No	0
It is dependable	1

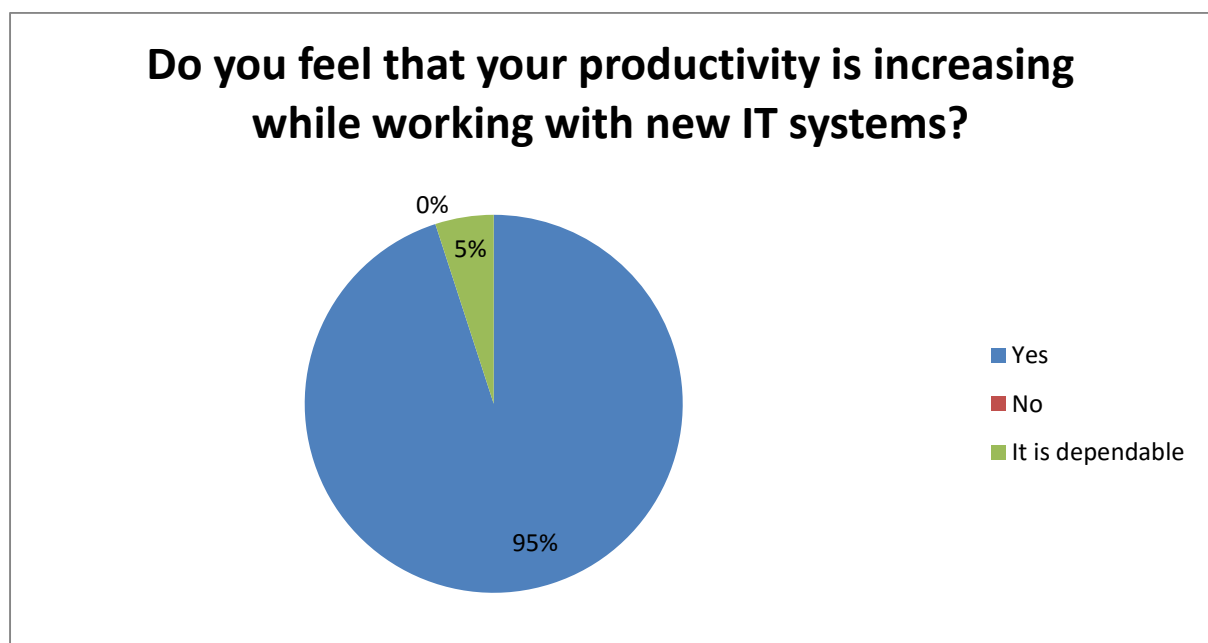


Figure4. 12: Interviewees' perception about the productivity, while working with new IT systems (Bank B)

95% of the employees pointed out that, they feel their productivity is increasing while working with new IT systems. One employee stated that it depends on the system. According to the one IT staff level employee the main reason for implementing the new system is to increase the productivity of the bank. Otherwise the system becomes useless.

15. Is there any process to measure employee productivity, after implementing the IT systems?

Bank A

95% of employees stated that yet the bank hasn't the standard process to measure the productivity after implementing the IT systems. But one senior Manager mentioned that they check whether the productivity is increase or not because of that IT system. In the near future, they are going to implement a performance measurement system to the bank. An employee stated that there are some indicators for productivity, such as number of customers served within a given time period, the time taken to complete the process, reduced staff involvement, the possibility of providing new deliver the channels for customer service.

Bank B

All the employees stated that yet the bank hasn't the standard process to measure the productivity after implementing the IT systems.

15.1. Do you believe it is essential to have such a process to measure employee productivity?

Bank A

Employees believed that it would be great if there is a system to measure their productivity after implements the new IT systems. Further, they stated that, it will essential to our career life also. It gives additional recognition for them; it will become an additional source to evaluate the employees; it enables to evaluate the system as well as the employees

Bank B

All the IT staff level employees believe that it would be great if there is a system to measure their productivity after implement the new IT system. More adding to that, they stated, it helps to increase the overall productivity of the system and the customer's satisfaction as well. They opined that the bank can successfully face to their competitors if they increase their overall

productivity. A Senior Manager stated that by using such a process, they can evaluate both the system and their employees. Further, they hope to develop such a system in the near future.

16. Do you find that, it is easy to get IT systems to do, what you want to do?

Bank A

Table4. 13: Interviewees’ perception about the easiness of the IT systems (Bank A)

Yes	14
No	2
It is dependable	4

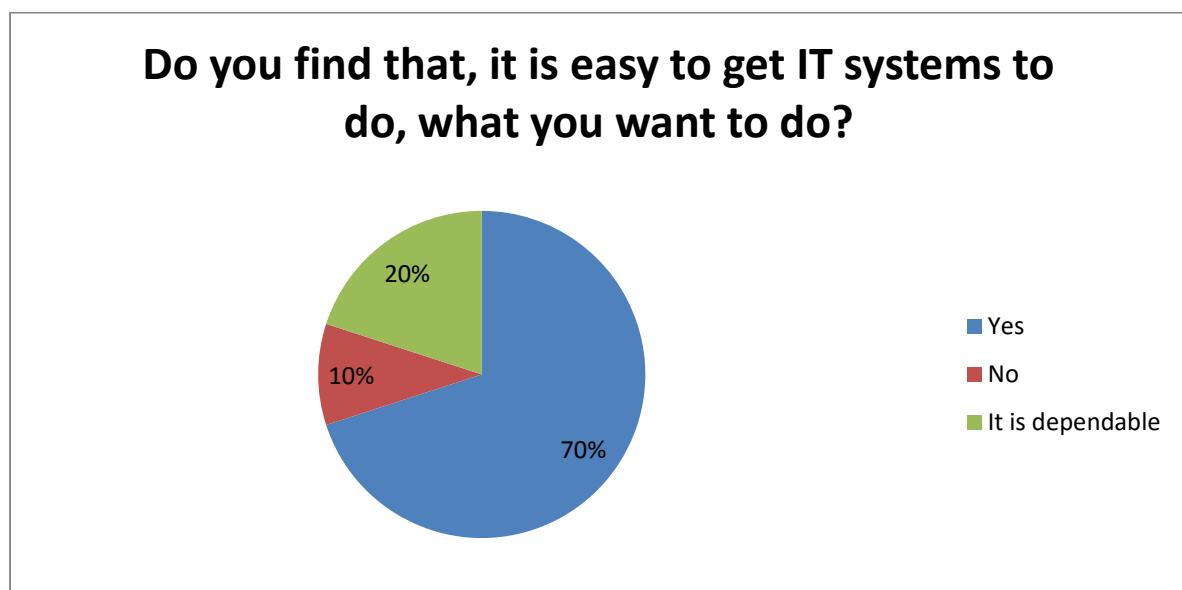


Figure4. 13: Interviewees’ perception about the easiness of the IT systems (Bank A)

70% of employees have directly stated that it is easy to get IT systems to do, what they want to do. But four employees opined that it depends on the system and two employees directly stated that it is not easy. But the senior management employees stated controversial answer, one pointed out that "No, it is not easy. Because the systems do not provide the very things that we want. If we want to change or upgrade the system we have to follow lengthy procedures. Because we are belong to state bank sector". The other employee stated that "Yes, before implementing the system, we prepare a requirement specification form according to that expected requirement should be there". One staff level employee declared that it is the most prominent thing they expect from a new system.

Bank B

Table 4. 14: Interviewees' perception about the easiness of the IT systems (Bank B)

Yes	15
No	2
It is dependable	3

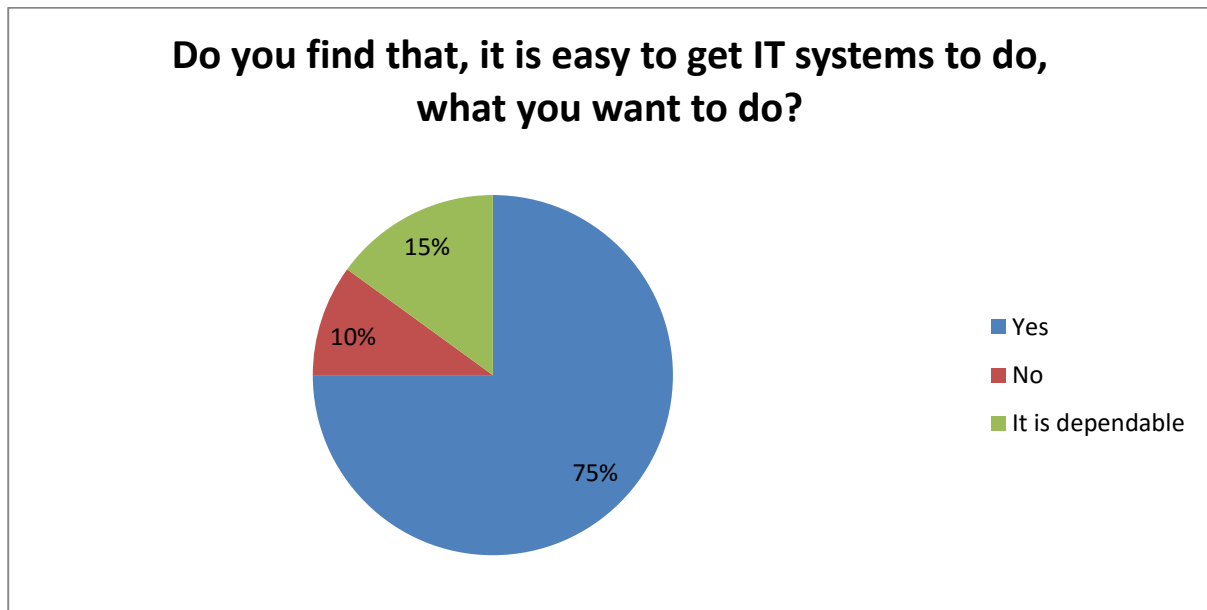


Figure 4. 14: Interviewees' perception about the easiness of the IT systems (Bank B)

75% of employees have directly stated that it is easy to get IT systems to do, what they want to do. But four employees opined that it depends on the system and two employees directly stated that it is not easy. But the Senior Management Employees stated controversial answer, one Senior Manager pointed out that "No, it is not easy, because the systems do not provide the very things that we want. It caters some percentage of their needs only. The other senior level employee stated that they get the system through required specifications and requirements should meet. One staff level employee pointed out that it is the 1st requirement bank is looking for. If the new systems unable to cater the bank's expectations and expected requirements, then the system is useless and failure.

17. Do you believe that learning and operating new IT systems are easier for you than past systems? Why?

Bank A

Table 4. 15: Interviewees' perception about the learning and operating the new IT systems (Bank A)

Yes	14
No	1
It is dependable	5

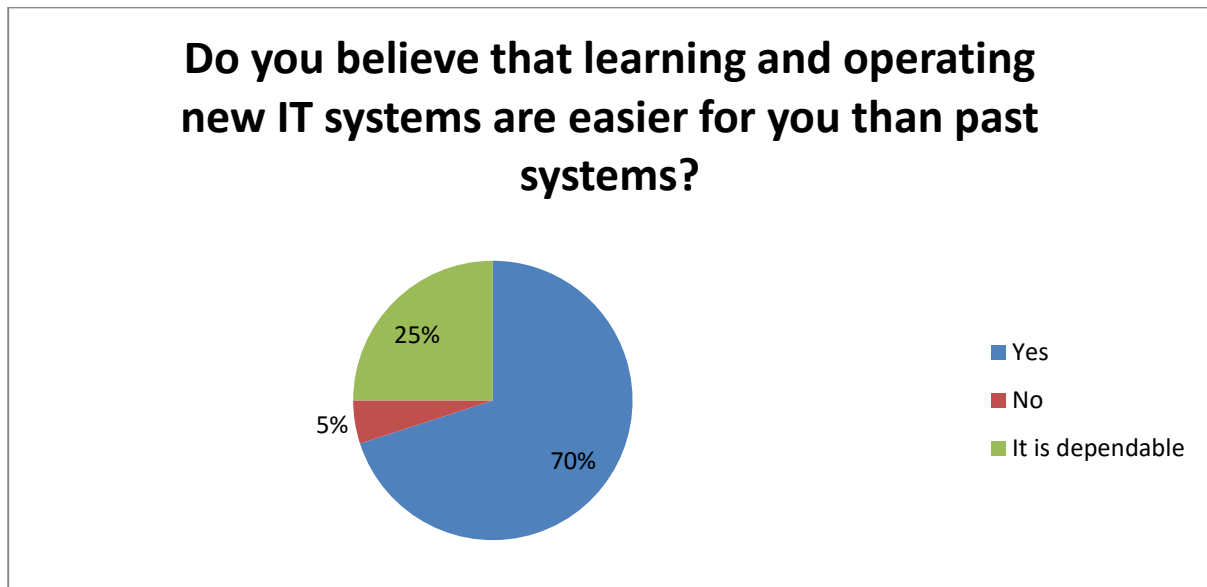


Figure4. 15: Interviewees' perception about the learning and operating the new IT systems (Bank A)

70% of employees stated that it is easier than past systems; giving the following reasons, the new systems are users friendly and easy to operate and handle with available shortcuts, help and hot keys. But some employees stated that in the new system, learning part is hard because they have to learn them while doing other work and operating part is easy because of user friendliness of the system. One employee stated that if the system is in-house developed, it is easier to learn than if it is a vendor supported system. Only one employee pointed out that learning new things are not easy, so people are comfortable with old systems when compared with learning to operate the new systems

Bank B

Table4. 16: Interviewees' perception about the learning and operating the new IT systems (Bank B)

Yes	17
No	1

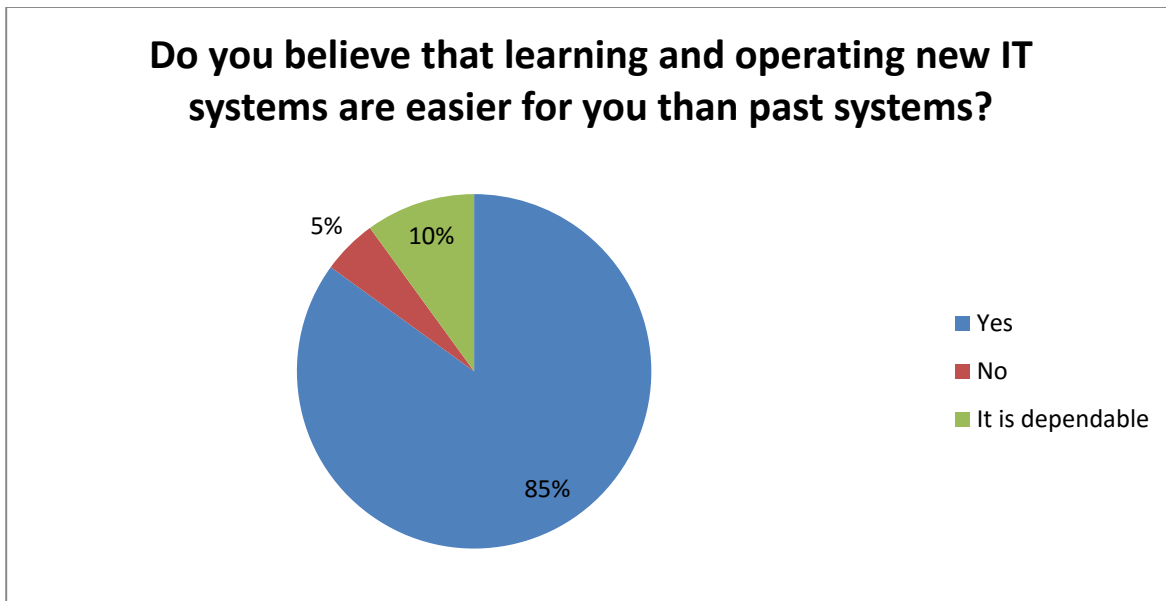


Figure 4. 16: Interviewees' perception about the learning and operating the new IT systems (Bank B)

The majority of the employees (85%) stated that it is easier than past system by giving reasons mentioned below, such as, new systems are user friendly because of the user-friendly features, more resources, availability of resource persons, the technology is more familiar and new IT systems could be implemented with more user friendly languages. But one employee mentioned that the learning and operating part in the new system is hard, because they have to learn them while doing other work no any time for that and it can be avoided by participating more training programmers. One staff level employee stated that operating part is easy because of graphical user interfaces.

4.1.4. TTF related questions

18. How do you feel about having more functions in new IT systems?

Bank A

All of the employees stated that having more functions are acceptable if there is any requirement. Without proper requirements, having more functions creates an additional burden

for them. If a new system has more functions than the requirement, it will affect the user friendliness of the system and the performance and complexity. Senior Management Level Employees also believed that functions should be matched to the actual requirements and further, they stated that "It has two sides. The numbers of functions are not a matter if the requirement is important. But we should have to design the functions not to affect to the users' performance".

Bank B

Table 4. 17: Interviewees' perception about having more functions in the new IT systems (Bank B)

Positive feeling	15
Negative feeling	3
It depends	2

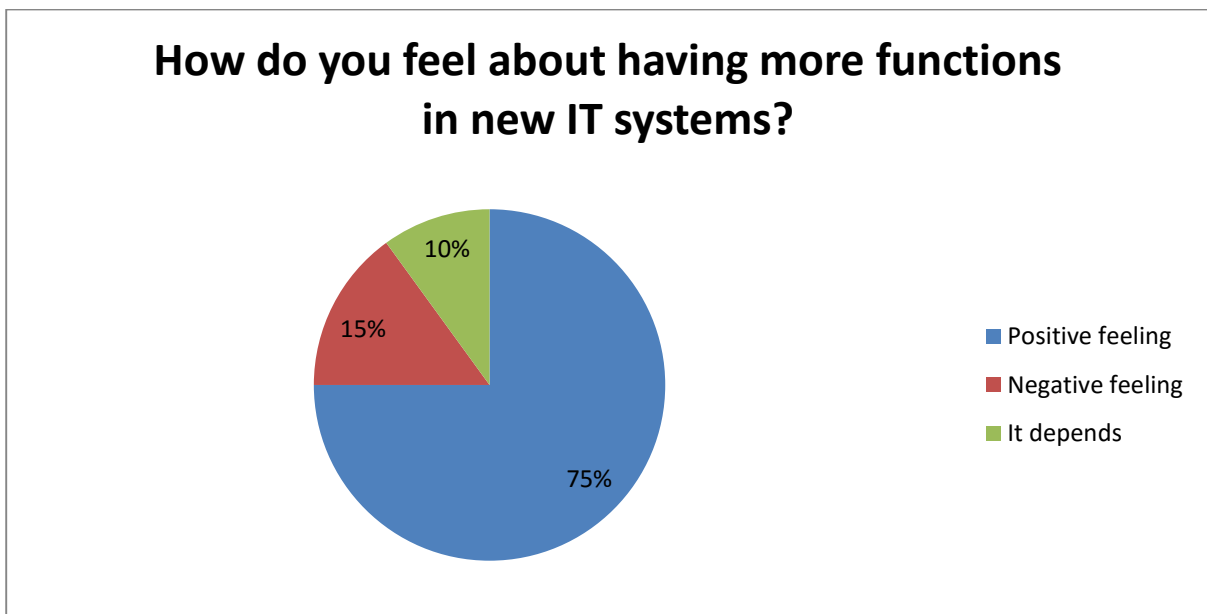


Figure 4. 17: Interviewees' perception about having more functions in the new IT systems (Bank B)

75% of employees had positive feeling about having more functions in new IT systems. But all of them stated that having new functions will be advantageous if and only if it is really required. Otherwise, it will be a headache for both users and the developers. One senior manager declared that he/she has negative feelings about that because Simplicity is the most important thing and having more functions may reduce the simplicity of the system. 10% of employees stated that it depends on the job roles and requirement.

19. Have you frequently dealt with ad hoc and non-routine (complex) problems while working with new IT systems? 20. What are those problems?

Bank A

Table4. 18: Interviewees’ perception about ad hoc and non-routine (complex) problems of the new IT systems (Bank A)

Yes, frequently	4
Yes, but not frequently	4
No	12

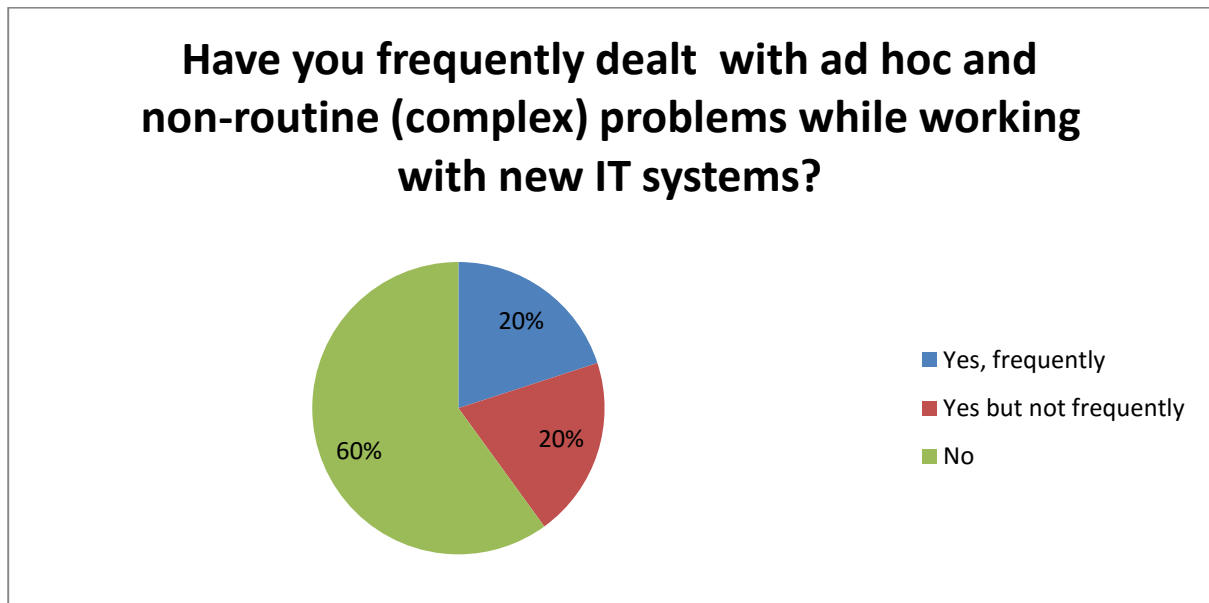


Figure4. 18: Interviewees’ perception about ad hoc and non-routine (complex) problems of the new IT systems (Bank A)

60% employees stated that there is no any frequent ad-hoc and non-routine problems occurred. Those employees declared that in the early stages, there are unbelievable problems, but when time passes the system becomes smooth. 20% of employees pointed out that they have frequently dealt with ad hoc and non-routine (complex) problems while working with new IT systems. Those are Performance issues, Customization issues, glitches, System may be crashed due to heavy data intensive operations, and Allocated memory pools not enough, bugs and sudden requirement changes. Rest of 20% mentioned that they have dealt with ad hoc and non-routine (complex) problems while working with new IT systems, but not frequently occurs. Furthermore, they stated that they have to change the system according to the new

requirements, Central bank enforces new rules suddenly, but their new system is not flexible to that rule, so that they have to change their system to comply that rule.

Bank B

Table4. 19: Interviewees’ perception about ad hoc and non-routine (complex) problems of the new IT systems (Bank B)

Yes, frequently	7
Yes, but not frequently	6
No	7

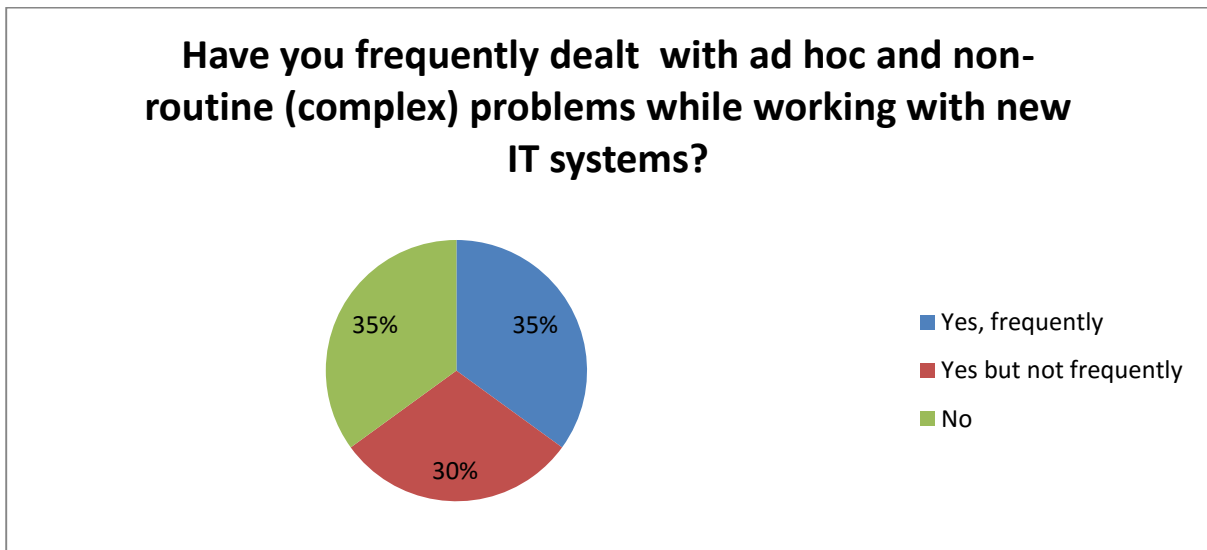


Figure4. 19: Interviewees’ perception about ad hoc and non-routine (complex) problems of the new IT systems (Bank B)

35% employees stated that there is frequent ad-hoc and non-routine problems occurred. Those are network problems, restrictions, data errors and incompatibility issues, and the system down randomly. 30% of employees stated that there are non-routine and complex problems but not frequently occur. Those are Ad-hoc new regulations, decisions from the regulator, data transferring issue and system crashes, allocated memory pool issues and data duplication issues. 35% of employees mentioned that there are no any frequent issues. One senior management level employee stated that sudden regulatory changes have occurred, some ad-hoc problems with their systems. They have to change their system according to the sudden changes.

21. Are you getting the help you need in accessing newly implemented IT systems from your superiors?

Bank A

Table4. 20: Interviewees' perception about the help given by their superiors in accessing newly implemented IT systems (Bank A)

Yes	18
No	2

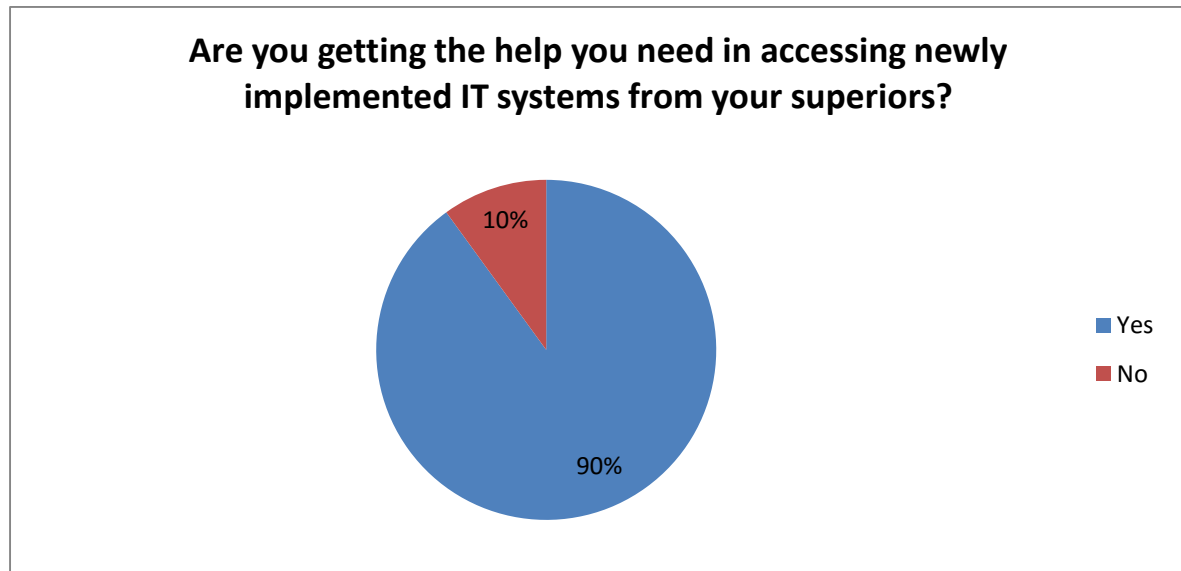


Figure4. 20: Interviewees' perception about the help given by their superiors in accessing newly implemented IT systems (Bank A)

90% of employees stated that they are getting support from their superiors when they need the support. But surprisingly, two employees mentioned that their superiors do not support them when they actually need it. The Senior Management pointed out that they are willing to support their subordinates at any time when they request the support.

Bank B

Table4. 21: Interviewees' perception about the help given by their superiors in accessing newly implemented IT systems (Bank B)

Yes	20
No	0

All the staff level employees stated that they received the help from their superiors in accessing newly implemented IT systems. The senior management level employees stated that they are eagerly waiting to give support to their subordinates if they request the help. in addition to that

one senior manager pointed out that If they cannot give the support through internally, they get external support from the vendors or the local experts (MIT).

22. Can you/employee get knowledge easily and quickly about the newly implemented IT system when you need it?

Bank A

Table4. 22: Interviewees’ perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank A)

Yes	13
No	7

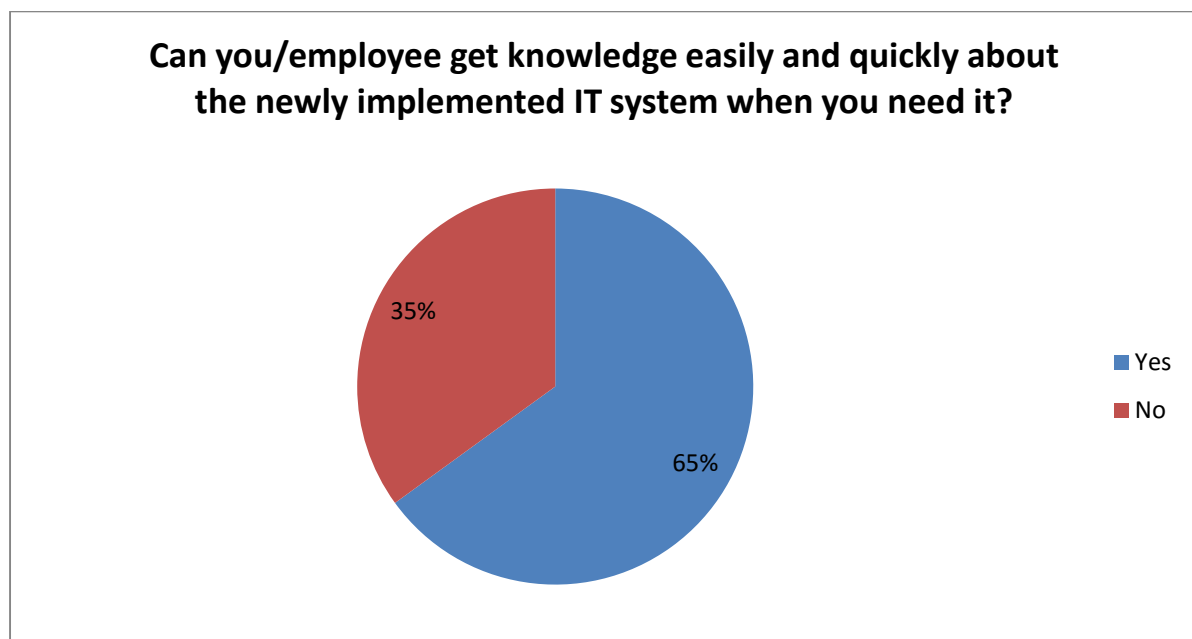


Figure4. 21: Interviewees’ perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank A)

The senior management employees stated that employees can get knowledge easily and quickly when they need it and also both internal and external support is available. Furthermore, they have the internet facility also. But seven staff level employees mentioned that they cannot get knowledge easily and quickly about the newly implemented IT system when they need it. Another 11 staff employee mentioned that, they get knowledge easily and quickly about the newly implemented IT system when they need it. Furthermore, they stated that there are more training facilities and opportunities. So they can get further knowledge about the system easily.

Bank B

Table4. 23: Interviewees’ perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank A)

Yes	18
No	2

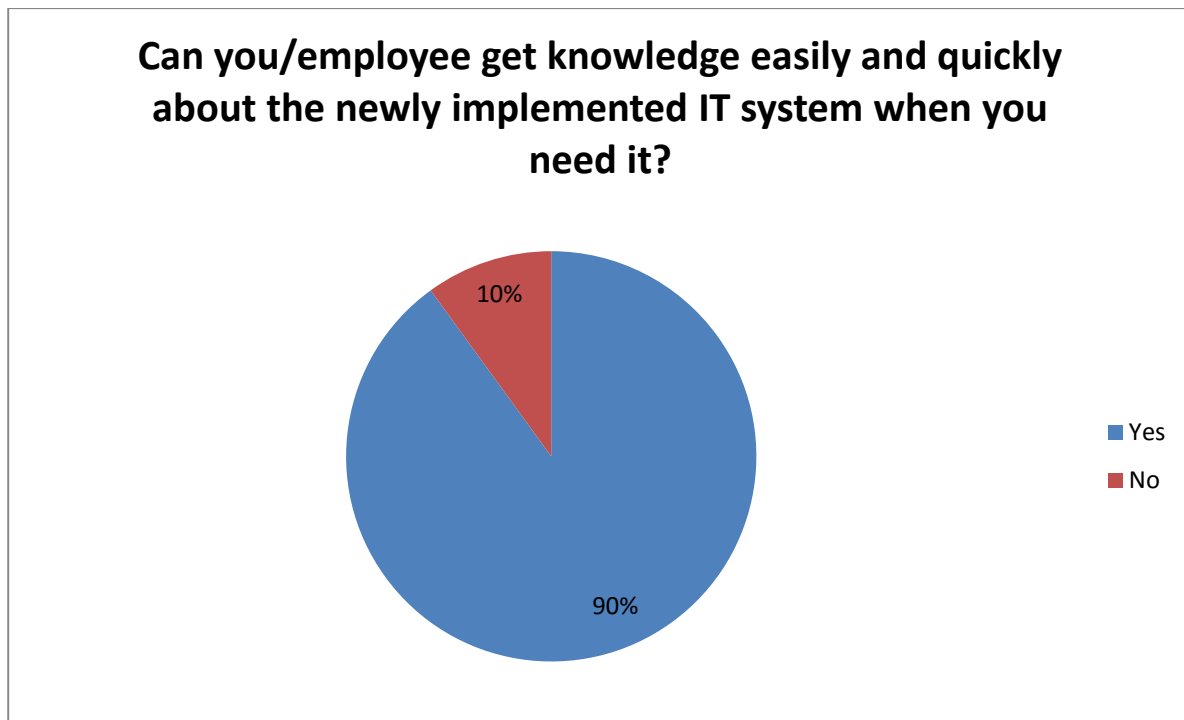


Figure4. 22: Interviewees’ perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank A)

90% of the employees stated that they can get knowledge easily and quickly about the newly implemented IT systems when they need it. Most probably they get support through the internet, internal support (peers and superiors) and vendors. Two staff level employees pointed out that they cannot get the knowledge easily and quickly when they need it. Above mentioned two employees highlighted that there are no any good user manuals in the bank and they have to work with limited resources.

23. Are there any technical issues arising frequently in your current working IT systems?

Bank A

Table4. 24: Interviewees' perception about the technical issues of the current working IT systems (bank A)

Yes, frequently	2
Yes, but not frequently	11
No	7

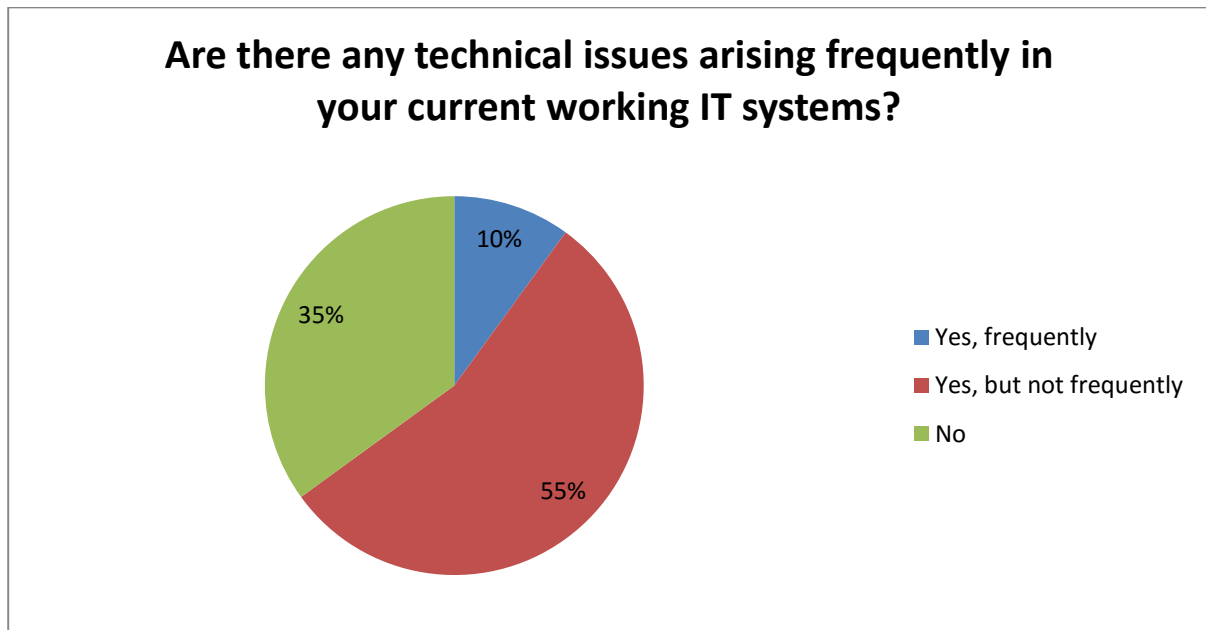


Figure4. 23: Interviewees' perception about the technical issues of the current working IT systems (bank A)

10% of the employees stated that there are technical issues arising frequently in the current working IT systems. 55% of employees mentioned that there are some technical issues But those are not arising frequently. Such as, some capacity issues, version changing issues, upgrading issues of the application for virus attacks and some communication failures. 35% of employees stated that there are no any technical issues. Furthermore, they mentioned that when the time passes the system becomes smooth and free of frequent technical issues.

Bank B

Table4. 25: Interviewees' perception about the technical issues of the current working IT systems (bank B)

Yes, frequently	4
Yes, but not frequently	9
No	7

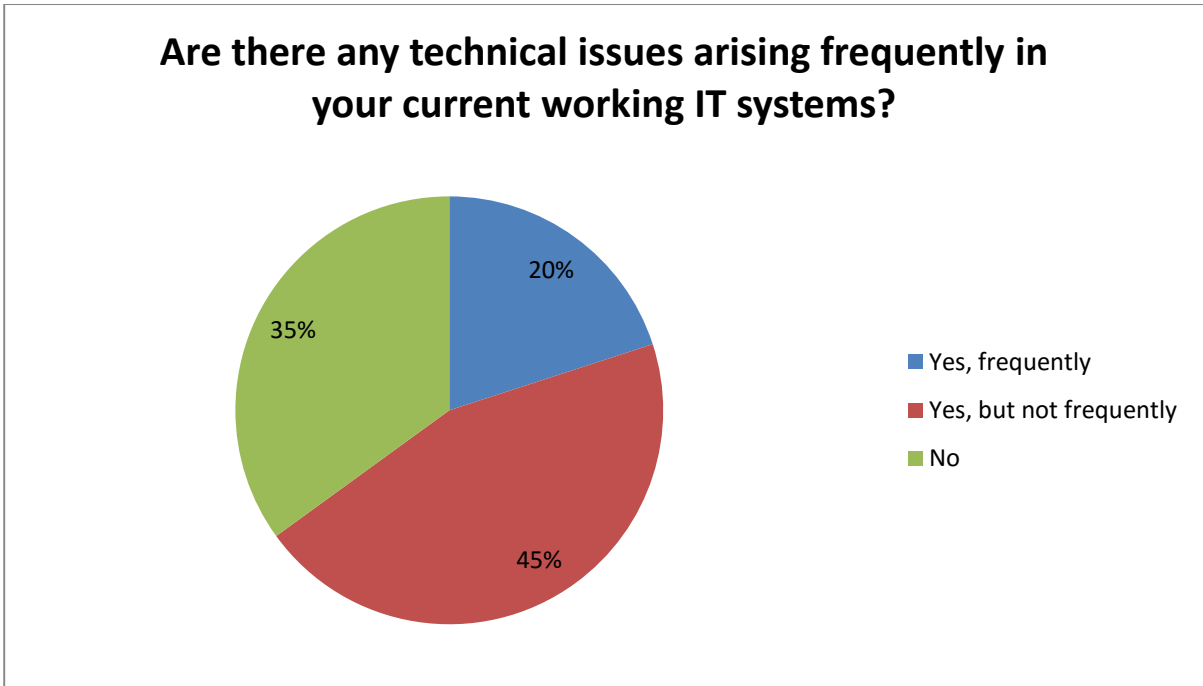


Figure4. 24: Interviewees' perception about the technical issues of the current working IT systems (bank B)

20% of employees stated that there are some frequent issues in current working IT systems, such as some capacity issues, version changing issues, networking issues, connectivity issues, performance issues and hardware not upgraded issues. 45% of employees stated that there are some issues, but not frequently occurs. Those are switch related issues, version changing issues and updating issues. 35% of employees pointed out that there are no any issues in current working IT systems and these are smoothly functioning now.

23.1. Have you informed those issues to your superiors?. How they respond to that?

Bank A

Staff level employees stated that if there is an issue we inform them and the superiors discuss with us about the issue and take some remedial actions for that issue.

Bank B

Staff level employees stated that if there is an issue they inform them to the superiors and the superiors discuss with them about the issue and take some remedial actions for that issue.

4.1.5. Future planning related questions

24. What do you think about the new areas that would help your bank more effectively use IT?

Bank A

80% of employees think that online banking, mobile banking, SMS banking and convenient banking are the new areas that banks can more effectively use IT. One employee stated that banks can use IT effectively for the human resources related activities. One senior management level employee pointed out that, in the bank, the majority of internal works done by manually. So, to develop the internal work automation system and document management system is considered in the near future.

Bank B

55% of employees think that online banking, mobile banking, SMS banking and convenient banking are the new areas that banks can more effectively use IT. But 35% of the employee directly stated that the bank should get a core banking system immediately to use IT effectively. Because without any centralized system they cannot use IT effectively. One senior management, employee stated that within the next two years they have to introduce a core banking system to the bank. One IT staff employee stated that implement a cognitive system, introduce artificial intelligence systems are the new areas the bank can use IT effectively. Other employees declared that HR management and developing mobile applications are the new areas that the bank can effectively use IT.

25. How do you think that the bank can use existing data to better plan future activities?

Bank A

50% of employees stated that the bank has huge databases and performing data mining, using business intelligence (BI) tools are the ways that the bank can use existing data to better plan future activities. The senior management employees pointed out that, they are planning to do a big data analysis of their databases and they can use business intelligence (BI) tools to find the intelligence data and insights of their customers such as which segment they prefer and which product they use most frequently and their behavioral patterns.

Bank B

70% of employees stated that, through data mining and using business intelligence (BI) tools, the bank can use existing data to better plan future activities. By using BI tools the bank will be able to identify the customer's patterns, behavior and new market trends. Some employees opined that lack of a centralized system and malfunctions of MIS department may impact negatively to this. Instead of data mining and BI tools some employees stated that Perform big data analytics and Internet of things (IOT) may be useful to use existing data to better plan future activities.

26. Do you need new functionalities in the existing IT systems to facilitate these future plans?

Bank A

All the employees stated the necessity of the new functionalities in the existing IT systems to facilitate the future plans. Yes of course. The senior management level employees pointed out that they cannot stay in one place and they have to move forward. So, they need new functionalities to cater the future plans. One employee opined that before adding more functionality to the existing systems, they have to make their current services stable and uninterrupted.

Bank B

95% of the employees stated the necessity of the new functionalities in the existing IT systems to facilitate the future plans. . The senior management level employees stated that there should be some new functionality. Otherwise the bank cannot deploy its future plans properly. But one staff level employee pointed out that he/she doesn't think the bank need new functionalities to facilitate the future plans. Instead of that, maintaining the current resources and functions correctly the bank could lead that.

4.2. Data analysis for IT systems, user employees

Bank A is a large public bank in Sri Lanka with a widely spread banking network and providing IT based services to all the branches.

Bank B is a public bank in Sri Lanka, strategically established to enhance the savings. It has comparatively less amount of branches than Bank A.

4.2.1. General questions (demographic and educational)

01. What is your age group?

Bank A

Table4. 26: Age group of the IT system user employees (bank A)

(55+)	2
(45-54)	1
(35-44)	3
(25-34)	6

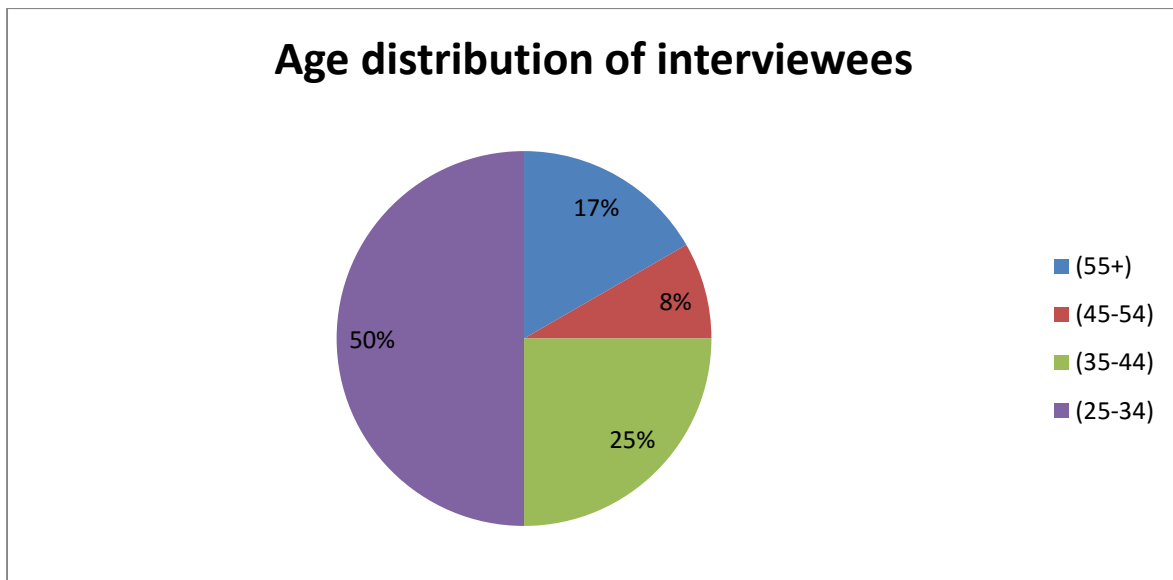


Figure4. 25: Age group of the IT system user employees (bank A)

Bank B

Table4. 27: Age group of the IT system user employees (bank B)

(55+)	0
(45-54)	0
(35-44)	3
(25-34)	9

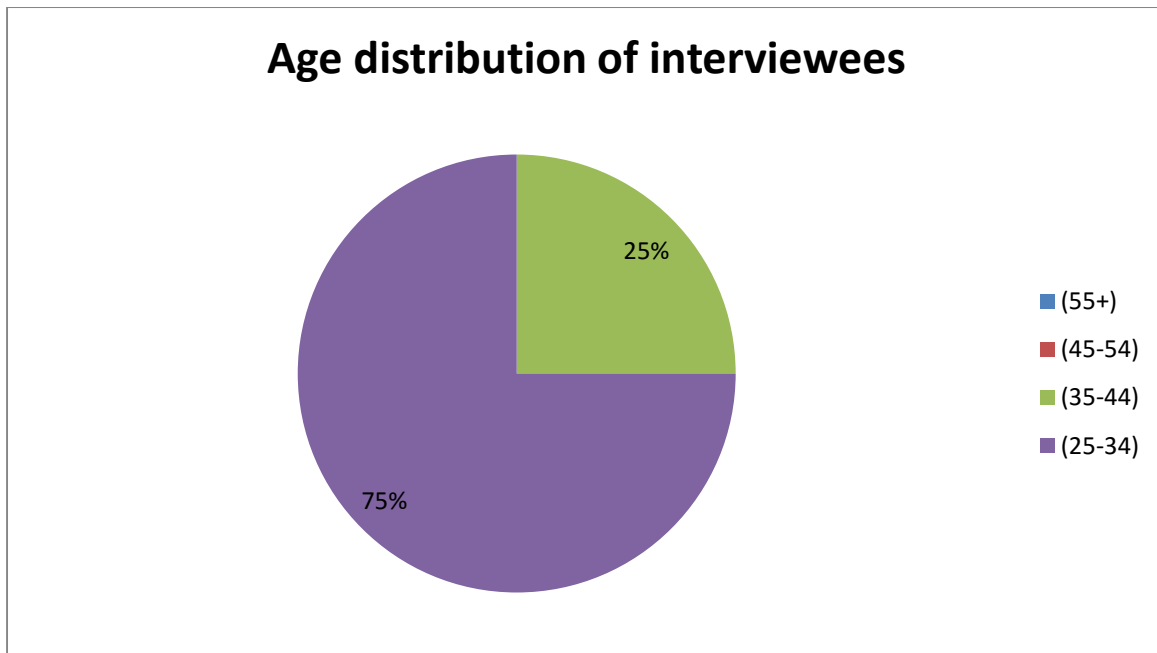


Figure4. 26: Age group of the IT system user employees (bank B)

02. What are your educational qualifications?

Bank A

Table4. 28: Education level of the IT system user employees (bank A)

BSc.	4
BSc./MSc.	0
PG. Diploma	1
Other(B.Com/BBM/AL)	6
BSc./PG. Diploma	0
BSc./MSc./MBA	0
BSc./MBA	1

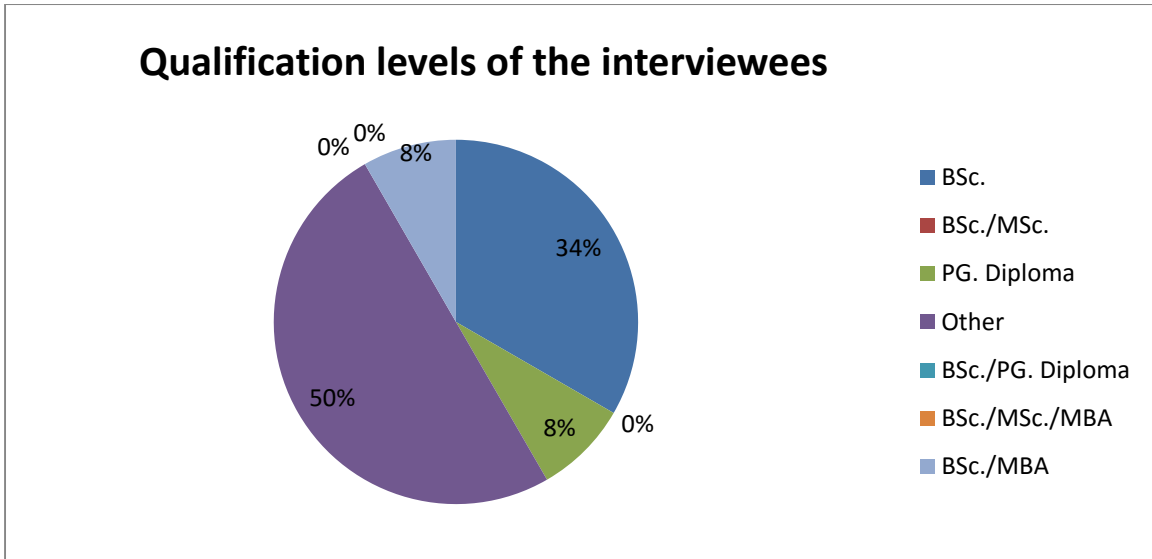


Figure 4. 27: Education level of the IT system user employees (bank A)

Bank B

Table 4. 29: Education level of the IT system user employees (bank B)

BSc.	5
Other (B.Com/BBM/AL)	7

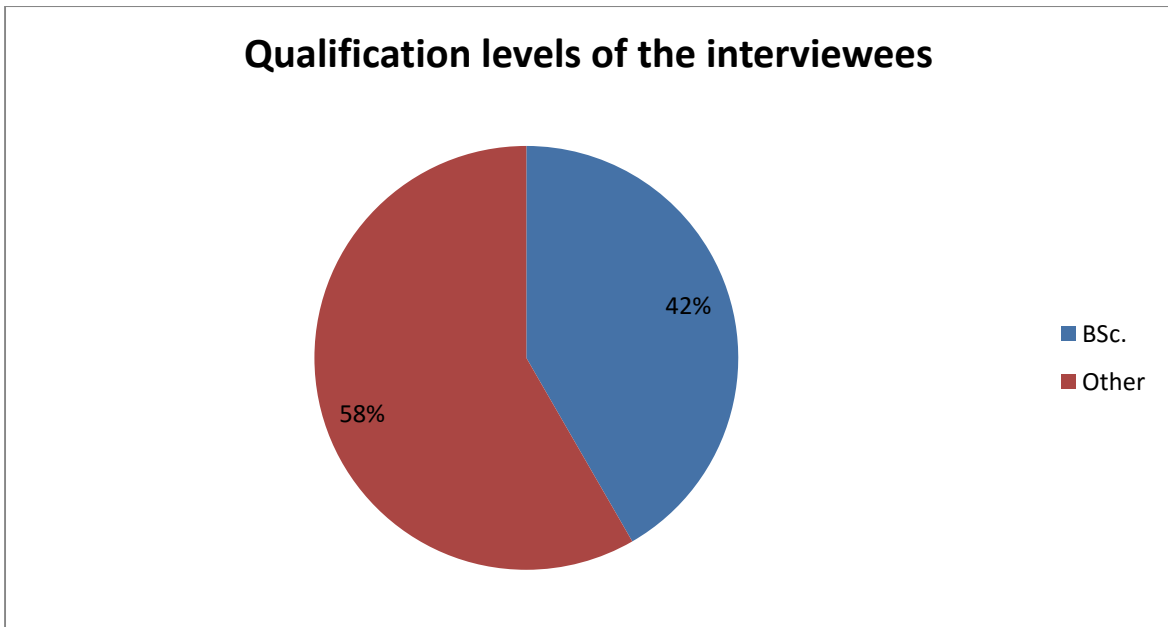


Figure 4. 28: Education level of the IT system user employees (bank B)

4.2.2. TAM related questions

3. How useful are the existing IT systems for your day to day works?

Bank A

All employees believed that the existing IT systems are very useful for their day to day works, such as offer efficient, timely, accurate and rapid customer service, minimize the processing time, reduce the paper works and increase the accuracy of the transactions. Some employees mentioned that, just a single click, employees are able to get a quick summary of the month ends and extract the data easily. Furthermore, employees stated that IT systems help to mitigate the risk and without IT systems they are unable to manage such amount of huge data load accurately and effectively.

Bank B

All employees believe that the existing IT systems are very useful for their day to day works, such as reducing the workload, increasing the speed of the transaction, giving rapid and accurate customer service with the least amount of paperwork. One employee stated that IT system has a standard path and formats. Every employee has to follow those formats and paths. So works are very clean and clear. Another employee stated that, Early they have to take the mandate to get the information about the customers. But now they can get all the details about the customers by typing their identity number. So it reduces the unwanted delays and speed up the decision making process also.

4. Have you felt the need of any other systems than the existing IT systems?. If so, what are those systems?

Bank A

Table4. 30: Interviewees perceptions about the need of any other systems than the existing IT systems (bank B)

Yes	3
No	9

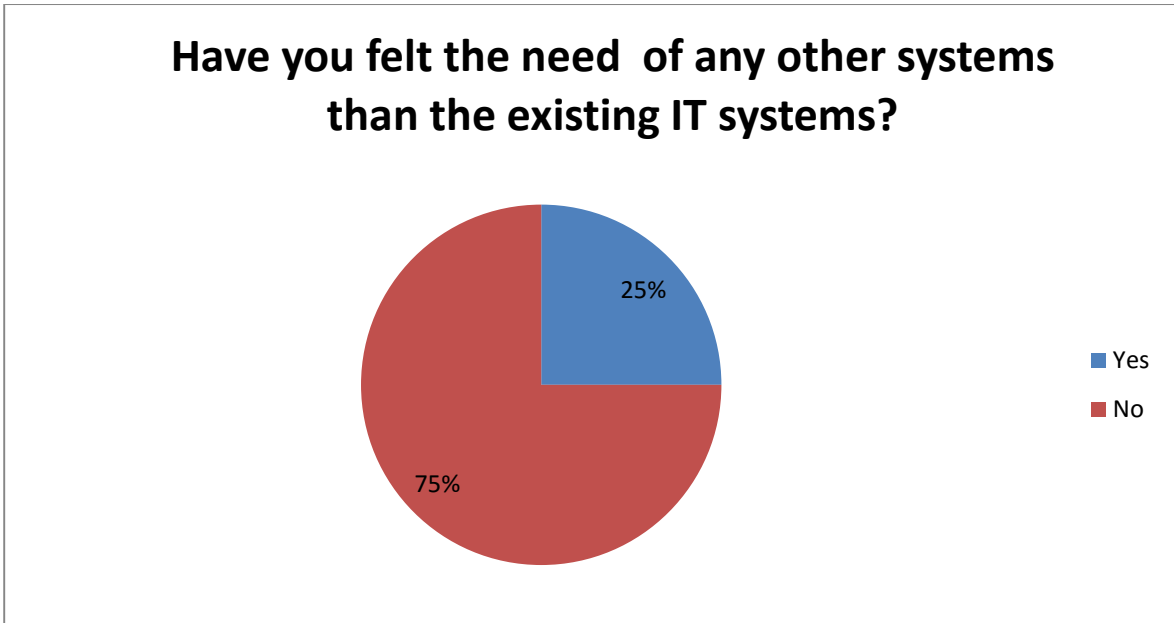


Figure4. 29: Interviewees perceptions about the need of any other systems than the existing IT systems (bank A)

75% of employees stated that they did not feel the need of any other systems than existing systems. The current system is catering their needs well. But, 25% of employees opined that they need an advance IT systems instead of current IT systems. Furthermore, they reveal the weak areas of the current working systems such as, unable to get the prints of current accounts and loans instantly, GL accounts have to enter into the system manually. Some employees opined that it is better to have card less ATM system and DMS (document management system) to their current working IT systems.

Bank B

Table4. 31: Interviewees perceptions about the need of any other systems than the existing IT systems (bank B)

Yes	12
No	0

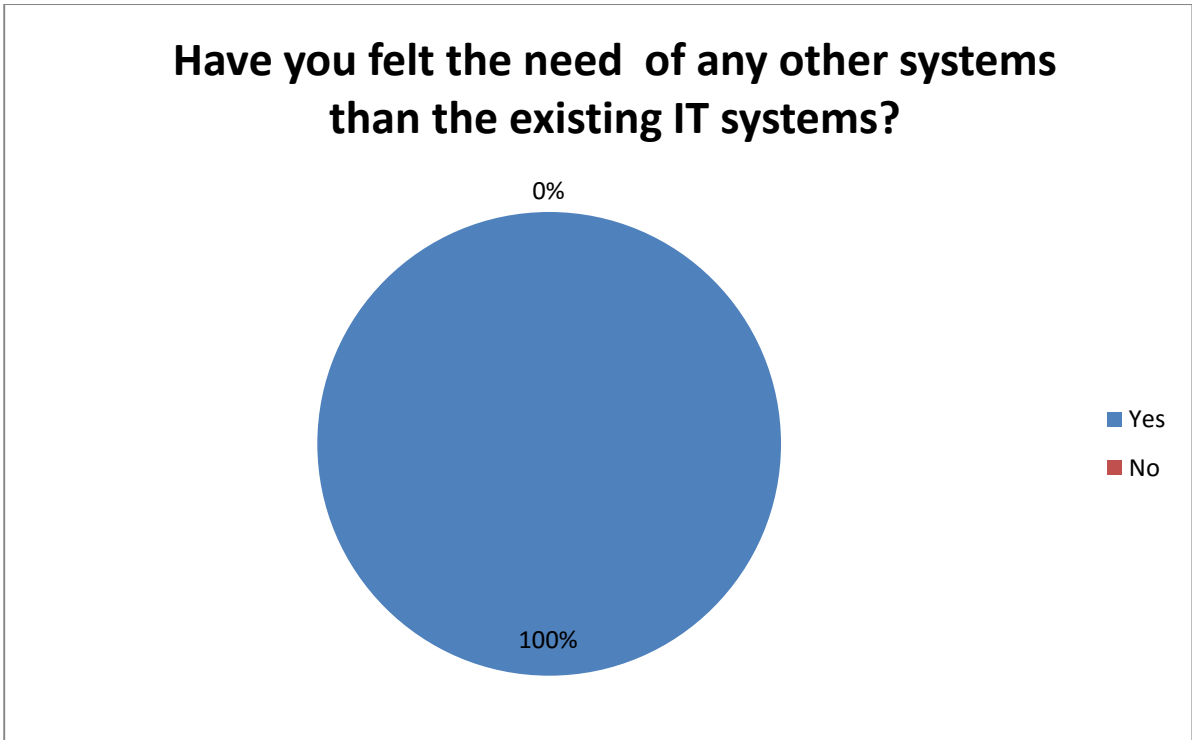


Figure4. 30: Interviewees perceptions about the need of any other systems than the existing IT systems (bank B)

All the employees stated that they feel the need of other systems than existing IT systems. Furthermore, they stated that the need of a centralized system than working in a separate standalone system. Such as, log on and log out into several systems to perform a single task. So it is better to have one centralized system for all and. Some employees stated that the bank has not a core banking system yet and inside the bank there are at least 8 systems. Instead of those 8 systems it will be better to have one system. Two employees stated another side of the system which needs to improve. Those are, the current system has not any method to keep scan copies of customers' signatures. If any case they have to send the fax to relevant branches to get the customer's signatures and It is better to have a document management system (DMS).

5. Are there any technical issues arising frequently in your current working IT systems?

Bank A

Table4. 32: Interviewees perceptions about the technical issues arising in their current working IT systems (Bank A)

Yes, frequently	3
Yes, but not frequently	9

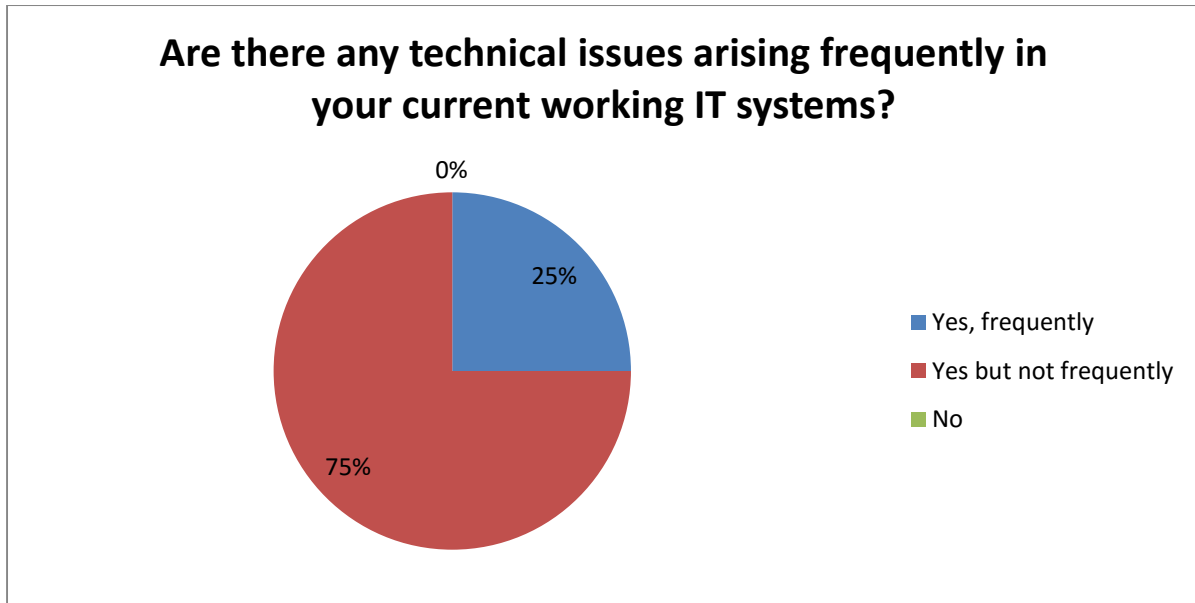


Figure4. 31: Interviewees perceptions about the technical issues arising in their current working IT systems (Bank A)

75% employees stated that there are some technical issues in their current working IT systems, but those are not occurring frequently. Those technical issues are, systems get crashes, systems updating issues, systems get stuck, communication failures, month and startup issues, SMS alert issues (customers have not received the SMS alerts) and reminder letter generation. 25% of employees stated that there are some frequently occurring technical issues such as communication failures, the system gets slow down.

Bank B

Table4. 33: Interviewees perceptions about the technical issues arising in their current working IT systems (Bank B)

Yes, frequently	8
Yes, but not frequently	4
No	0

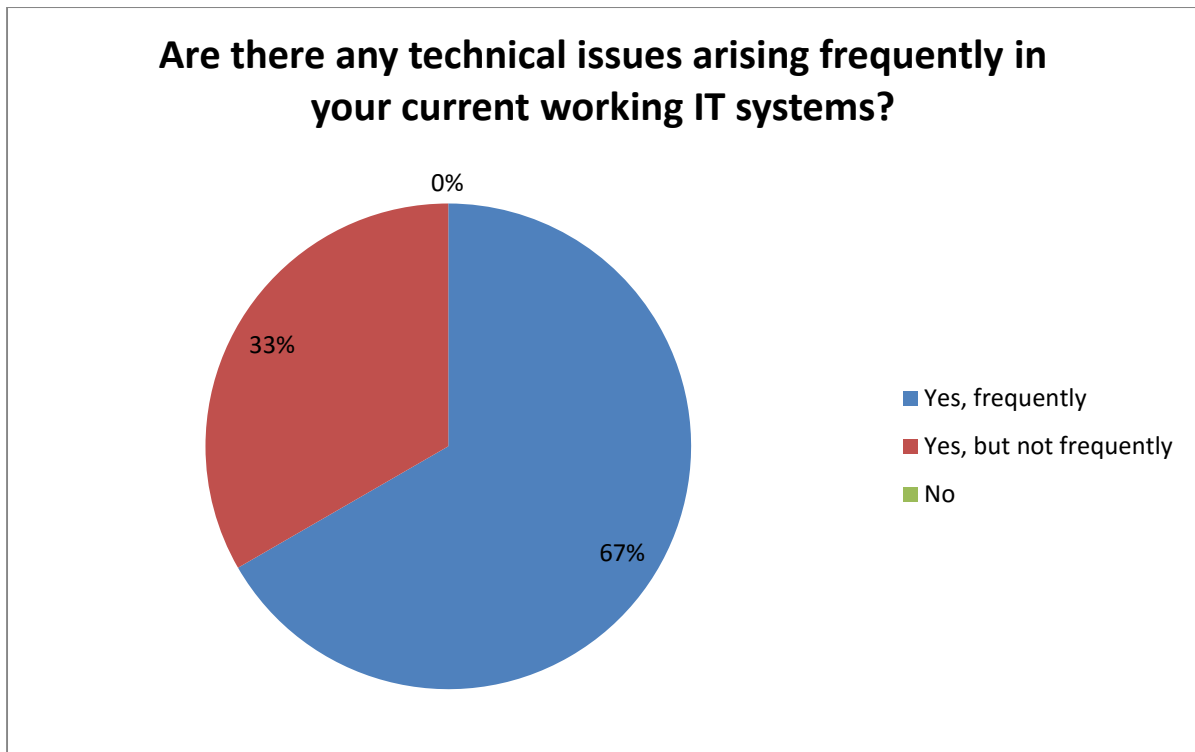


Figure 4. 32: Interviewees perceptions about the technical issues arising in their current working IT systems (Bank A)

33% of employees stated that there are some technical issues in their current working IT systems, but those are not occurring frequently. Those technical issues are, the system gets slow down, systems get stuck and communication problems. 67% of employees stated that there are some frequently occurring technical issues such as system slowdown, Inter-branch transactions get slowdown, the system gets stuck, ATM system has some technical issues and Customers cannot get the money from the ATM.

6. What are your most common complaints and opinions about IT systems?

Bank A

The majority of the employees stated that system slow down as their most common complaint. There are other common complaints also. Those are, internet logging related complaints, system converting related complaints, systems get offline, SMS related problems, communication problems related complaints, systems get suck, password related complaints and month end startup related complaints.

Bank B

The majority of the employees stated that system slow down as their most common complaint. There are other common complaints also. Those are, from the current system does not permit to get more information, run time errors occur suddenly and GL entry updating issue.

7. Do you believe that IT systems enhance your/employee's performance?

Bank A

All employees believe that IT systems enhance their performance. Furthermore, they stated that IT system reduces the workload, increases the accuracy and speed of the transactions and avoid the duplication of data, better customer services than manual systems, able to get the big picture without wasting much time and it increases the quality of the works. One employee stated that they have new scanners, via those scanners they can communicate easily without wasting much time on fax machines. Ultimately, it will reduce the cost and time.

Bank B

All employees believe that IT systems enhance their performance. Furthermore, they stated that IT systems provide better service by the means of speed, efficiency and accuracy, It reduces the manual works and the work load, It reduces the data duplications and human errors. One employee stated that in early cash deposit method, they have to do lots of manual work. But now there is no any manual works and the system generate all the works. Because of that benefit they can move into the next customer quickly.

8. Do you feel that your productivity is increasing while working with IT systems?

Bank A

11 employees out of 12 feel that their productivity is increasing while working with IT systems. Furthermore, they stated that IT systems minimize the errors of the transactions and able to give quality output. One employee stated that, in the early stages the loan section needs the help of stenographer to carry out the process. But, now they do not need such assistance, the system does it for us. So, it enhances our productivity. One employee felt that productivity depends on the systems.

Bank B

11 employees out of 12 feel that their productivity is increasing while working with IT systems. Furthermore, they stated that quantity and the quality of the output is increasing while working with IT systems and they can give high amounts of output through the IT systems. One employee stated that the bank has internet banking and online banking systems, so the productivity is also increasing through those IT systems. Another employee stated that at the end of the day they are able to do a reasonable amount of works through the IT systems. Only one employee believes that productivity depends on the system.

9. Do you find that, it is easy to get IT systems to do what you want to do?

Bank A

Table 4. 34: Interviewees' perception about the easiness of the IT systems (Bank A)

Yes	7
No	5

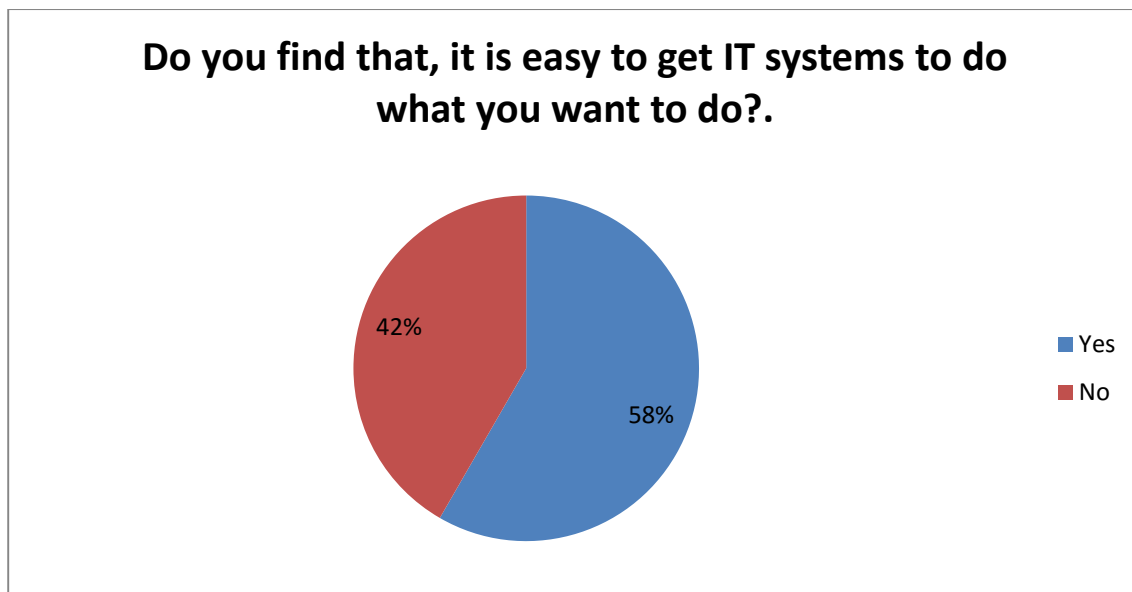


Figure 4. 33: Interviewees' perception about the easiness of the IT systems (Bank A)

58% employees stated that it is easy to get IT systems to do what they want to do. Furthermore, they stated that, if they are unable to do what they want to do from the IT systems, it is useless.

42% employees mentioned that it is not easy. Because that find that through the system they cannot get the maximum results. The system does not provide everything they need.

Bank B

Table4. 35: Interviewees’ perception about the easiness of the IT systems (Bank B)

Yes	6
No	5
It depends on the system	1

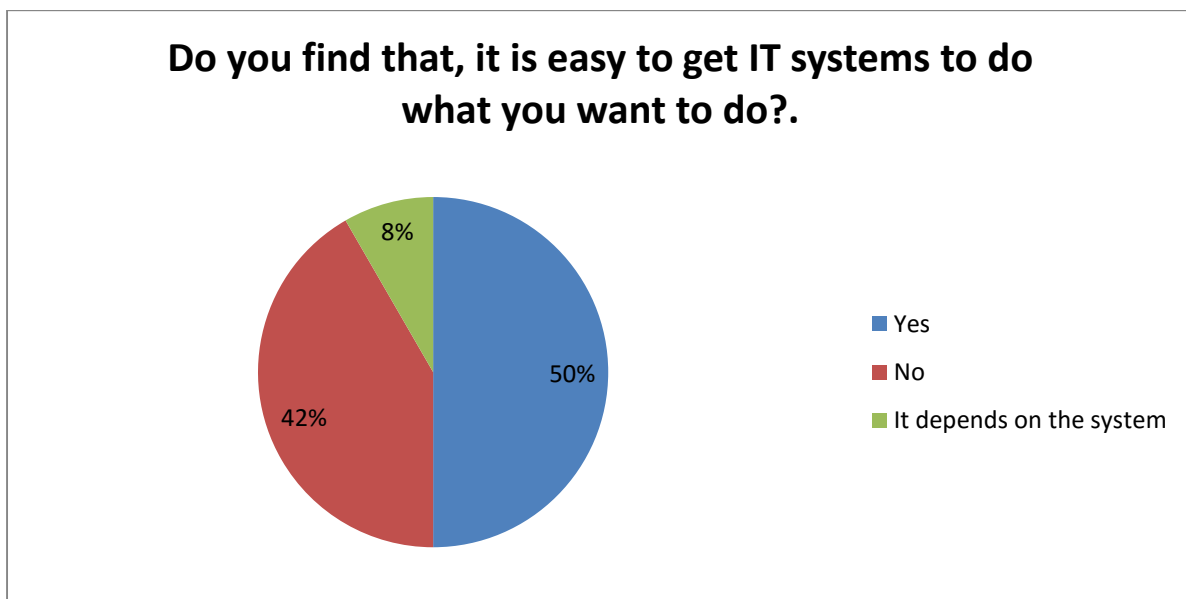


Figure4. 34: Interviewees’ perception about the easiness of the IT systems (Bank B)

50% of employees stated that it is easy to get IT systems to do what they want to do. Furthermore, they stated that, the main objective of implementing a new system is to do what you want to do. 42% employees mentioned that it is not easy, because, they cannot get all the things through the system. Only 8% of employees believed that it depends on the system.

10. Do you believe that learning and operating new IT systems are easier for you than past systems? Why?

Bank A

Table4. 36: Interviewees' perception about the easiness of the learning and operating new IT systems than past systems (Bank A)

Yes	10
No	1
It depends	1

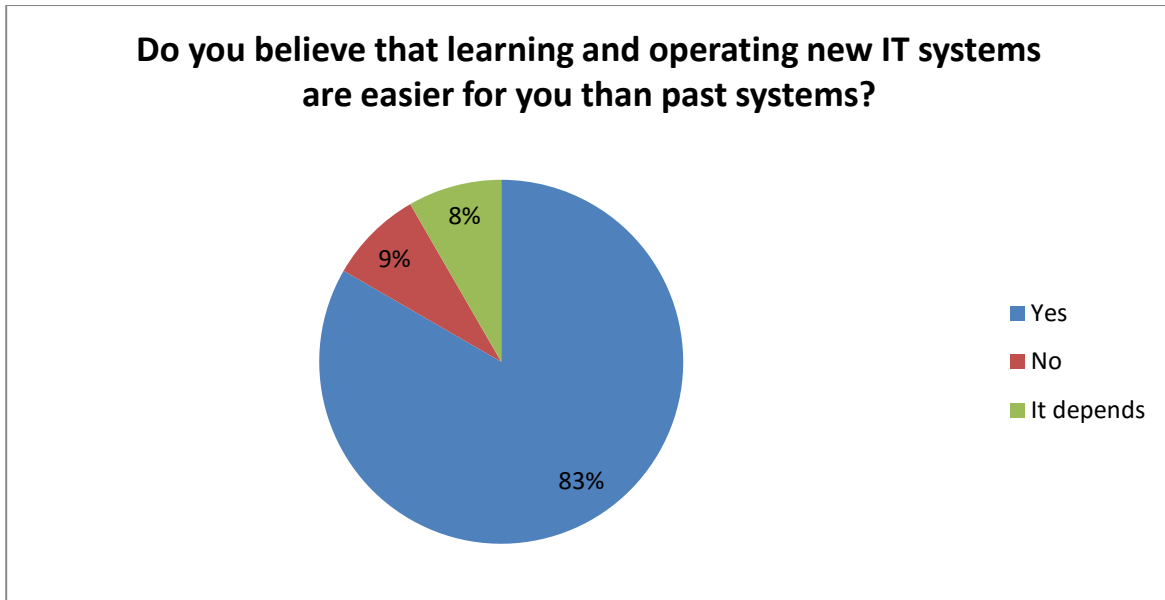


Figure4. 35: Interviewees' perception about the easiness of the learning and operating new IT systems than past systems (Bank A)

83% of employees stated that learning and operating the new IT systems are easier than past systems. Because user manuals are available at any time and the new systems are more user friendly than past systems. Furthermore, they stated that availability of the resources and trainings directly affect for the decision. But, 8% of employees believed that it depends on the system. 9% of employees believed that learning and operating new IT systems are not easier for them than past system. According to their belief learning new things are not easy and most of the employees are in their comfort zones.

Bank B

Table 4. 37: Interviewees' perception about the easiness of the learning and operating new IT systems than past systems (Bank B)

Yes	11
No	0

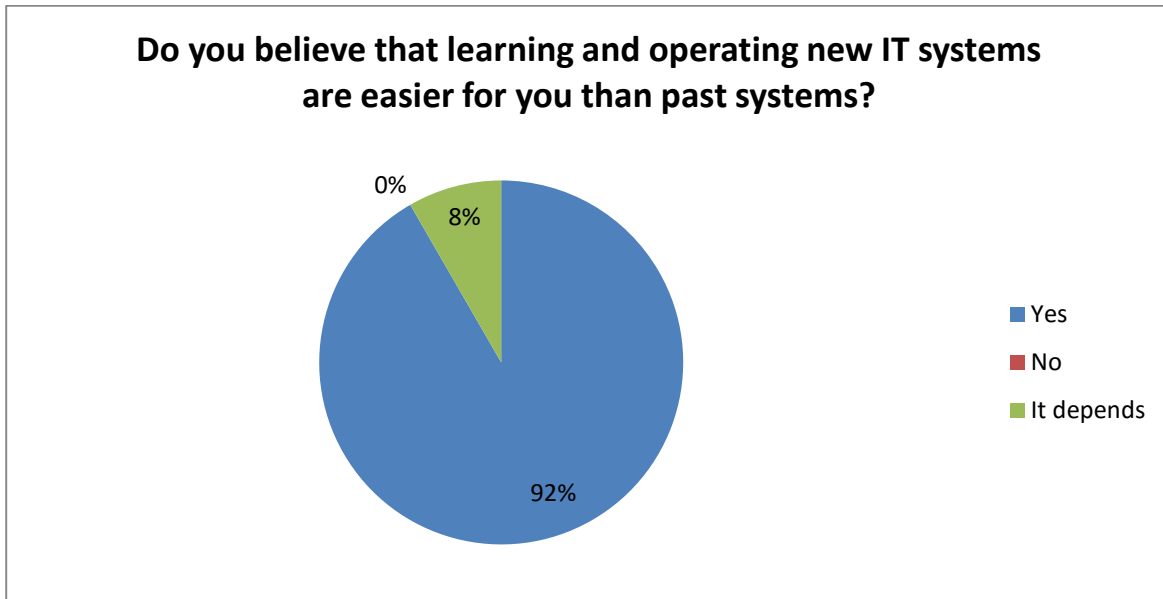


Figure 4. 36: Interviewees' perception about the easiness of the learning and operating new IT systems than past systems (Bank B)

92% of employees believe that learning and operating new IT systems are easier than past systems. Furthermore, they stated that the user-friendliness of the new systems and availability of user manuals and trainings aid them to operate the new IT systems easily. Having more learning materials and help desk support makes the learning part easy. One employee stated that they have circulars and predefined paths. So, they can learn and operate the systems easily. Another employee stated that they have basic computer knowledge and new systems are somewhat similar to the past systems. So it is easy to learn and operate. 8% of employees stated that easiness depending on the system. No any single employee believes learning and operating past systems are easier than new IT systems.

4.2.3. TTF related questions

11. How do you feel about having more functions in new IT systems?

Bank A

Table 4. 38: Interviewees' perception about having more functions in new IT systems (Bank A)

Positive	5
Negative	6
It depends	1

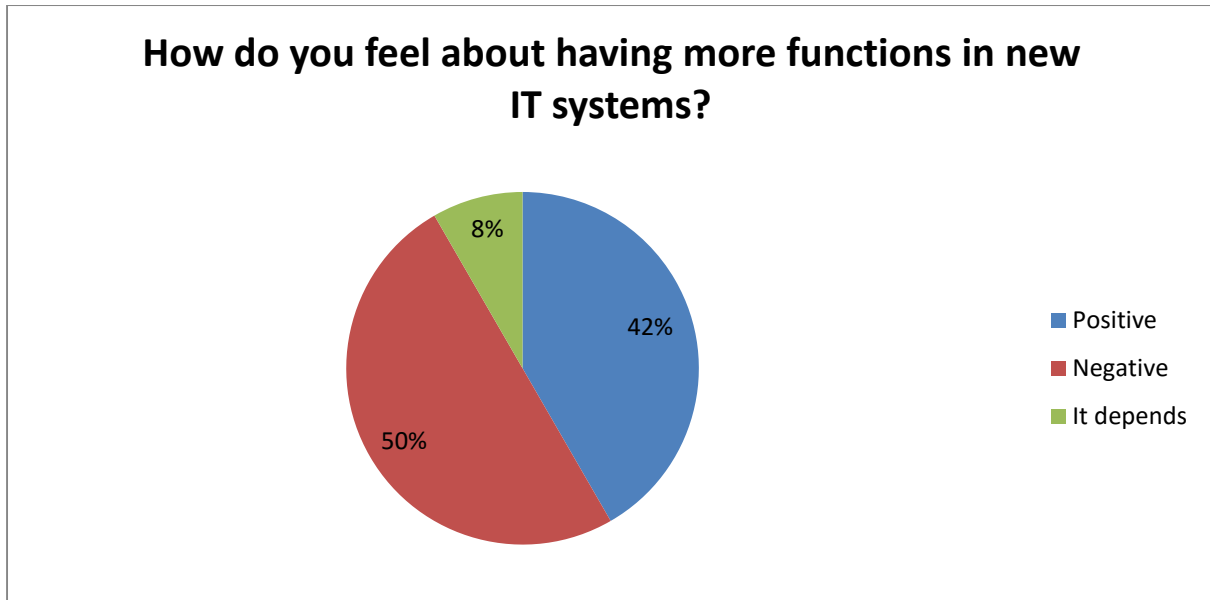


Figure 4. 37: Interviewees' perception about having more functions in new IT systems (Bank A)

42% employees had positive feeling about having more functions in new IT systems. They stated that if the functions are over the actual requirements it is a big burden for them. Some employees believe that have more functions expanded their working limits and they can work as an independent employee. Adding further, they stated that it should be parallel to the actual requirements. 42% employees had negative feeling about having more functions in new IT systems. They believe that having more functions definitely reduce the simplicity of the system and increase the complexity. One employee stated that if it is coming under the legal requirements, they have to accept that. One employee believes that it depends on the system.

Bank B

Table 4. 39: Interviewees' perception about having more functions in new IT systems (Bank A)

Positive	10
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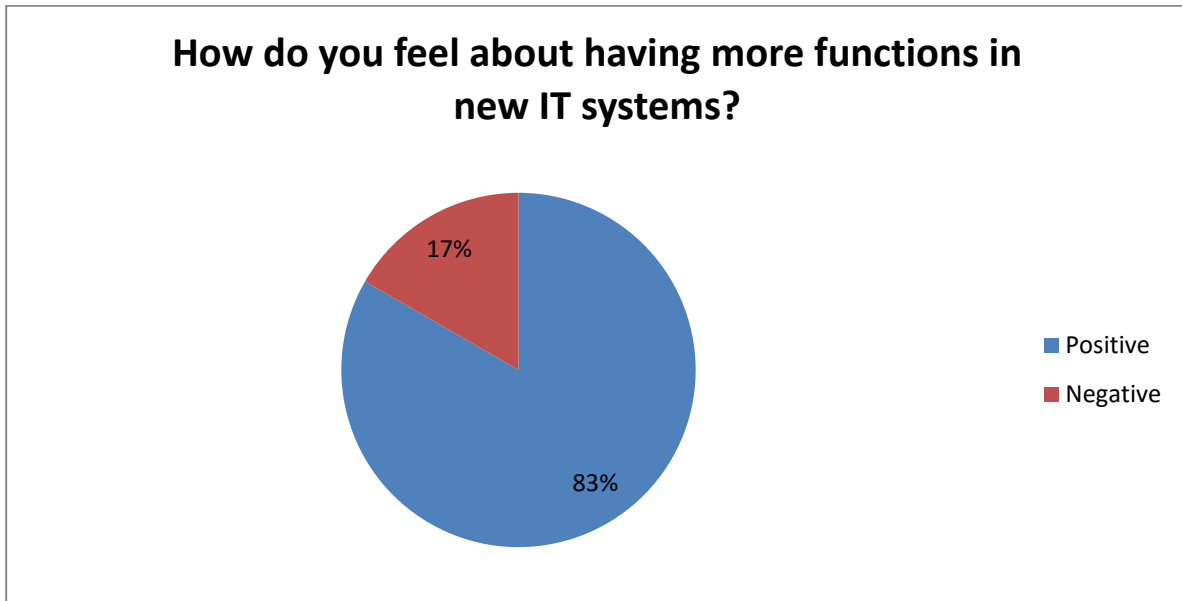


Figure4. 38: Interviewees' perception about having more functions in new IT systems (Bank B)

83% of employees have a positive feeling about having more functions in new IT systems. They stated that if the numbers of functions are high, they can get more information. But it should be matched to the actual requirements and functions should not reduce the simplicity of the system. Some employees stated that more functions permits to do deep analysis, and create new insights. 17% of employees have negative feelings. They believe that more functions may increase the complexity of the system. Further, they stated that having basic functions are enough to do day to day banking activities.

12. Have you dealt with problems while working with new IT systems?

Bank A

Table4. 40: Interviewees' perception about the problems dealt, while working with the new IT systems (Bank A)

Yes	11
No	1

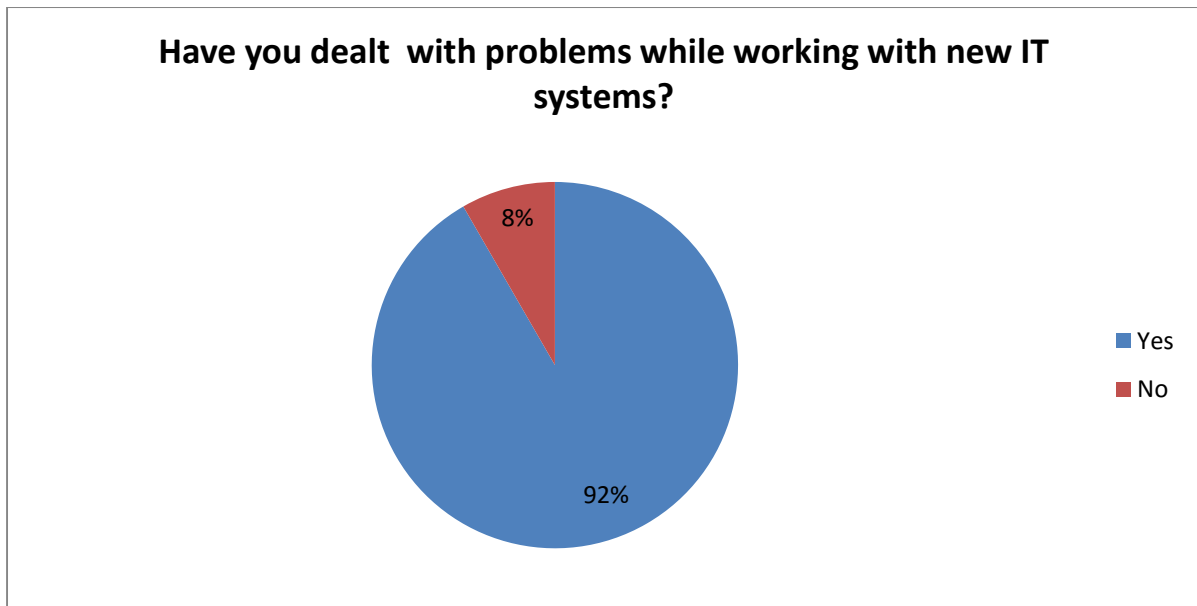


Figure4. 39: Interviewees' perception about the problems dealt, while working with the new IT systems (Bank A)

92% employees stated that they had to deal with problems while working with new IT systems and 8% employees stated that they have not dealt with any problems while working with new IT systems.

Bank B

Table4. 41: Interviewees' perception about the problems dealt, while working with the new IT systems (Bank B)

Yes	11
No	1

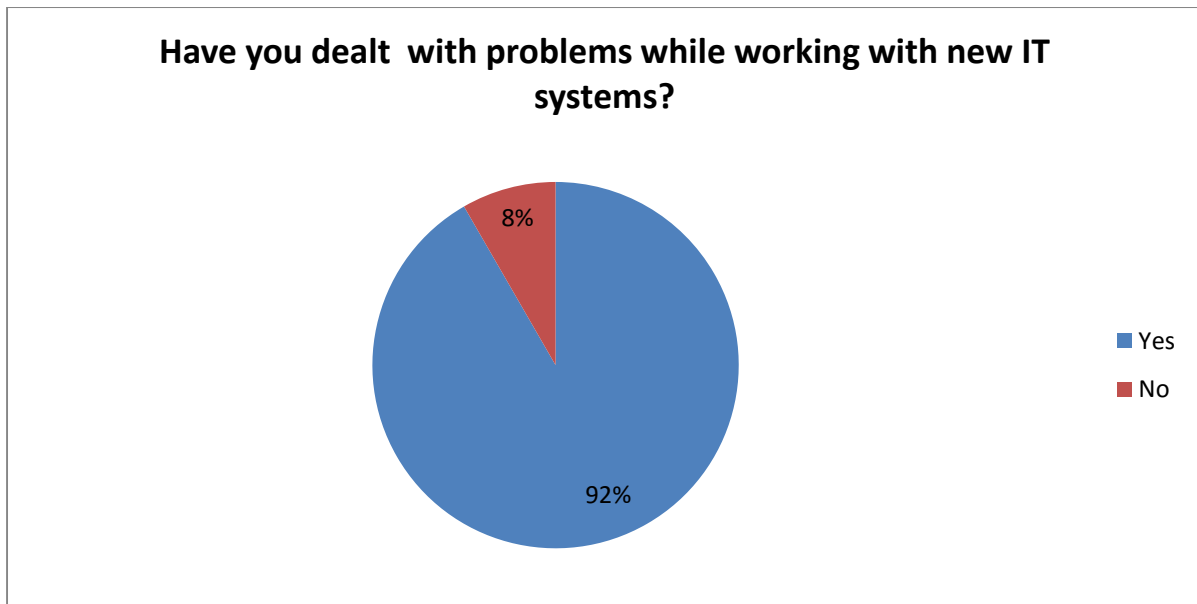


Figure4. 40: Interviewees' perception about the problems dealt, while working with the new IT systems (Bank B)

92% employees stated that they had to deal with problems while working with new IT systems and 8% employees stated that they have not dealt with any problems while working with new IT systems.

13. What are those problems (while working with new systems) you have dealt with?

Bank A

Related problems are, system crashes, communication issues, It takes much time to get familiarized with the system and during such periods we are unable to perform our work efficiently, user friendly related problems. Passwords disability issues, system get stuck and slow, hard to identify the functions and reluctance to change.

Bank B

Related problems are, it takes much time to get familiarized with the system, communication failures and user friendly related issues (New pawning system is working with capital letters). Sudden problems occur while working with the new system. Those problems cannot solve by using what they learn from the trainings or by using the user manuals. System errors are generated regularly and some familiarizing issues, not familiar with the shortcuts and keyboard related problems.

14. How did you overcome those Problems? (the problems related to working with new systems)

Bank A

08 employees out of 12 directly stated that they seek support from the IT department. Other employees stated that first, they get support from their colleagues, if they cannot solve it, and they seek support from their superiors and other branches. If both cannot solve it, they seek the support of the IT department and meanwhile they continue work manually till the problem gets resolved.

Bank B

09 employees out of 12 stated that they seek support from the IT department. Other employees stated that first, they get support from their colleagues, if they cannot solve it, and they seek support from their superiors and other branches. If both cannot solve it, they seek the support of the IT department and meanwhile they continue their work manually till the problem gets resolved. It is clear that on the job training is another method to overcome the issues.

15. Are you satisfied with the services provided by the IT department?

Bank A

Table 4. 42: Interviewees' satisfaction with the services provided by the IT department (bank A)

Satisfied	5
Not satisfied	6
Somewhat satisfied	1

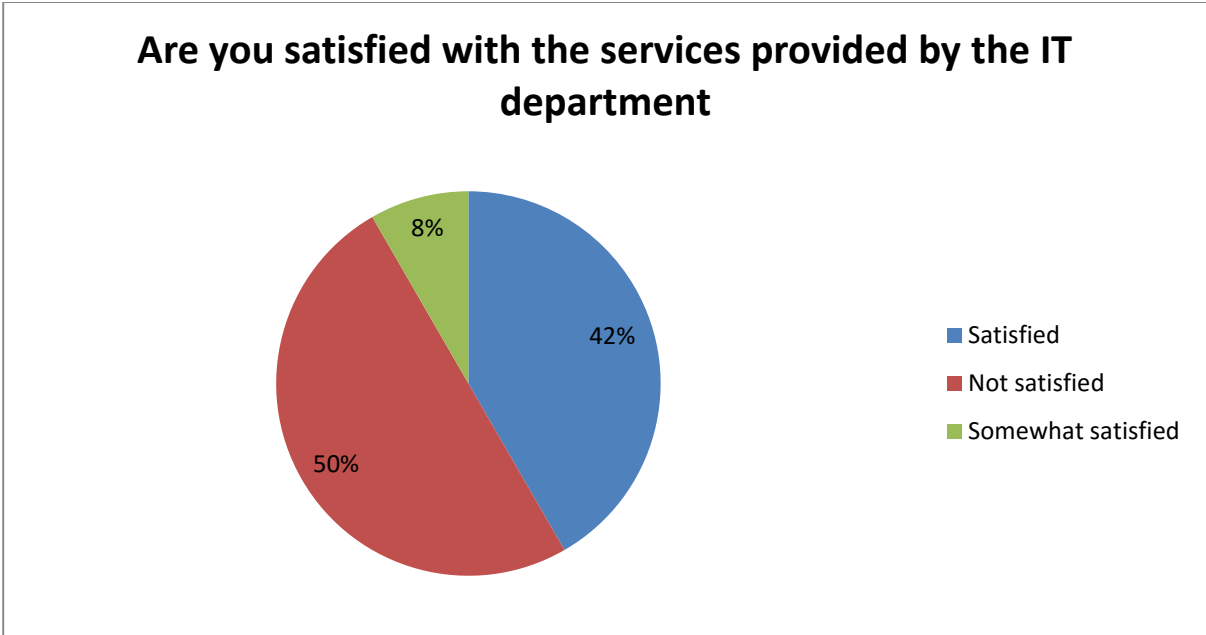


Figure4. 41: Interviewees’ satisfaction with the services provided by the IT department (bank A)

50% employees not satisfied with the services provided by their IT department. Employees stated several reasons for that. Those are, IT department does not respond when they need any assistance (not answering the telephone) and IT department has cause delays in attending to the complaints. But 42% employees satisfied with the services provided by the IT department. Meanwhile, 8% of employees partially satisfied with the services provided by the IT department.

Bank B

Table4. 43: Interviewees’ satisfaction with the services provided by the IT department (bank B)

Satisfied	6
Not satisfied	5

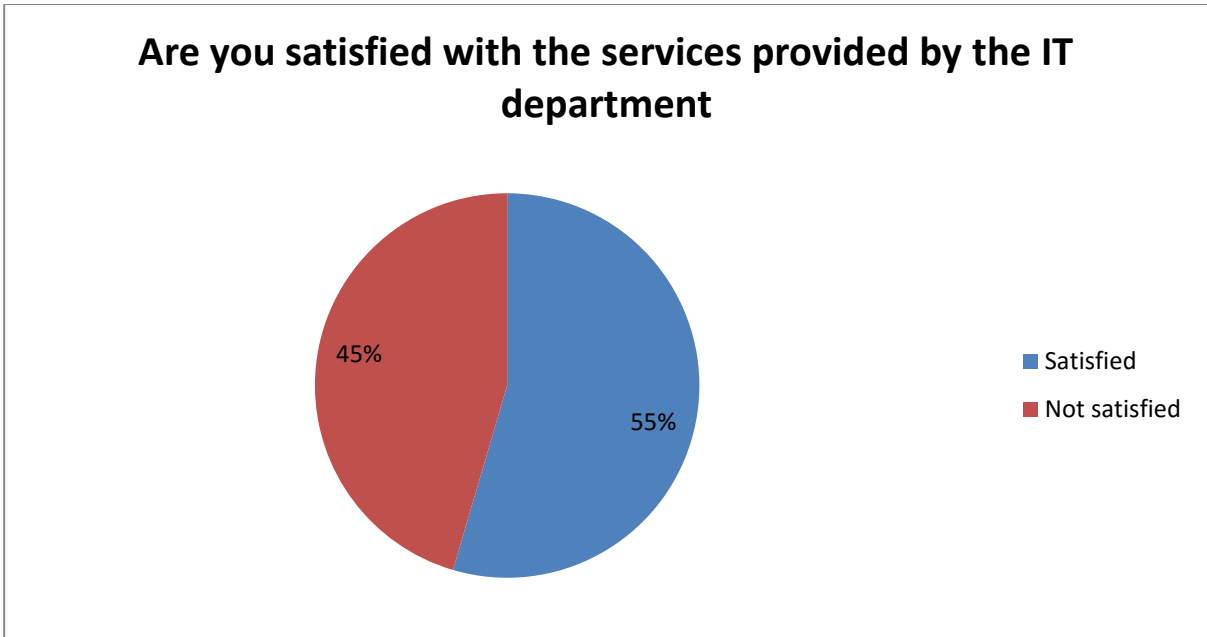


Figure4. 42: Interviewees’ satisfaction with the services provided by the IT department (bank B)

45% employees are not satisfied with the services provided by their IT department. Employees stated several reasons for their dissatisfaction. One employee stated that their IT department has less knowledge about the current working IT systems than themselves. Most of the time they have weak responses and only a few people in the IT department help them in time. But 55% of employees are satisfied with the service provided by the IT department.

16. Can you get knowledge easily and quickly about the newly implemented IT system when you need it?

Bank A

Table4. 44: Interviewees’ perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank A)

Yes	11
No	1

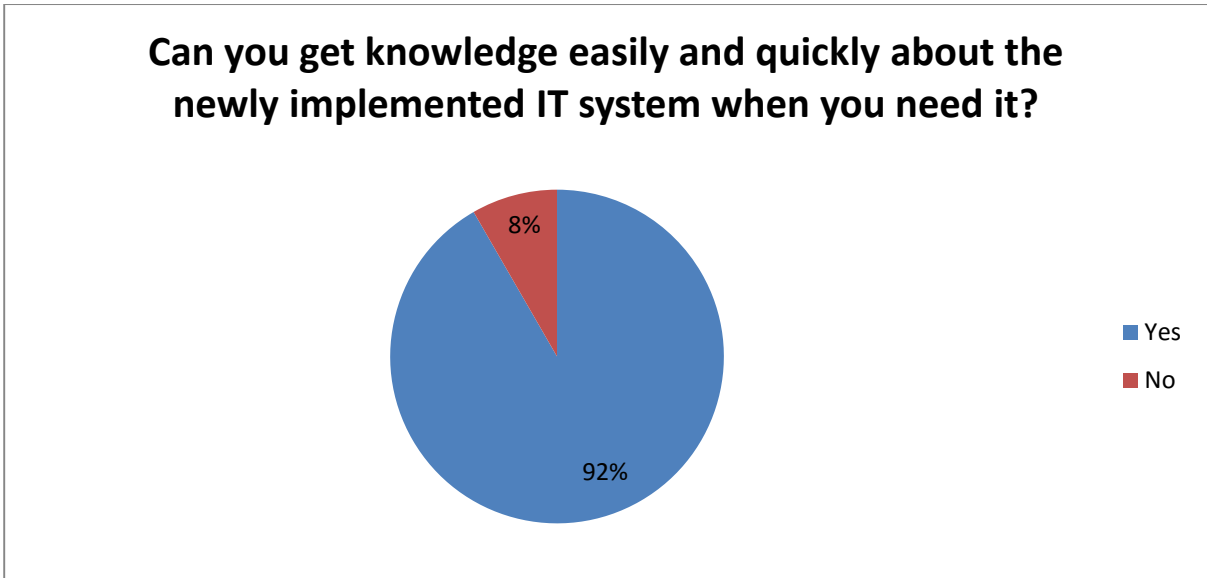


Figure4. 43: Interviewees' perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank A)

92% employees stated that they can get knowledge easily and promptly about the newly implemented IT system when they need it. Their IT department sent the user manuals to the branch via e-mails and Internet facilities are also available. Furthermore, they stated that they have trainings related to newly implementing IT systems and peer support is also available. One employee stated that recently the bank started the distance learning systems and through that they can get knowledge easily and quickly. But, 8% of employees stated that they cannot get knowledge easily and quickly pertaining to the newly implemented IT systems when they need it.

Bank B

Table4. 45: Interviewees' perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank B)

Yes	12
No	0

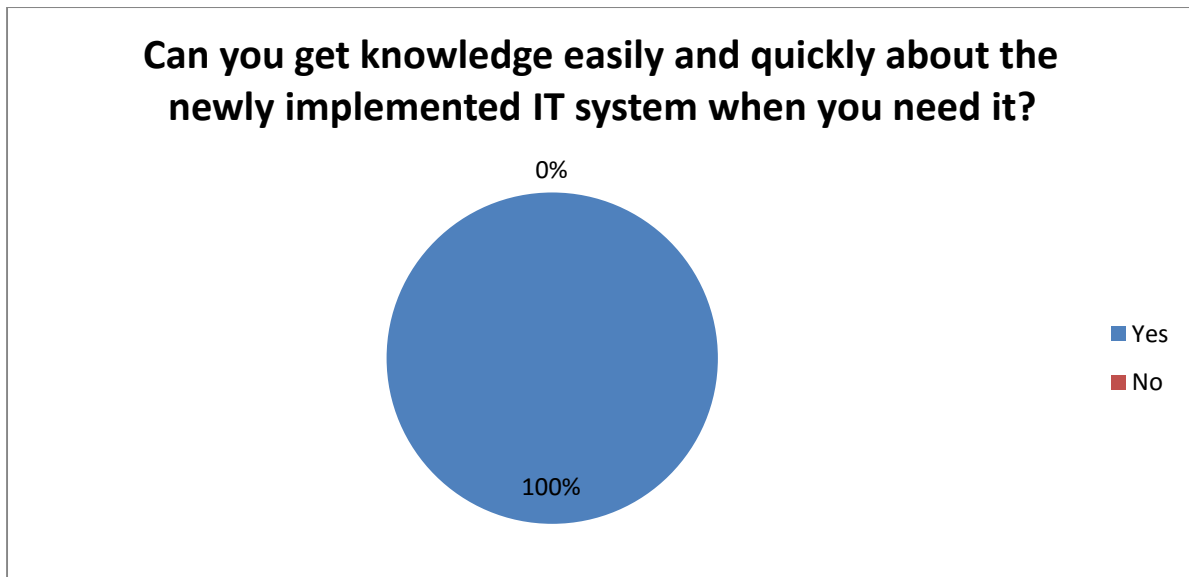


Figure4. 44: Interviewees' perception about the availability of the sources to gather knowledge easily and quickly about the new IT systems (bank B)

All the employees stated that they can get knowledge easily and quickly about the newly implemented IT system when they need it. Because of availability of user manuals, Internet facilities and help desk support. One employee stated that their IT department sends them a contact number of resource person for further assistance.

4.2.4. General questions (profession)

17. Have you faced any challenges while adapting the new IT systems?

Bank A

Table4. 46: Interviewees' perception about the challenges faced while adapting to the new IT systems (bank A)

Yes	11
No	1

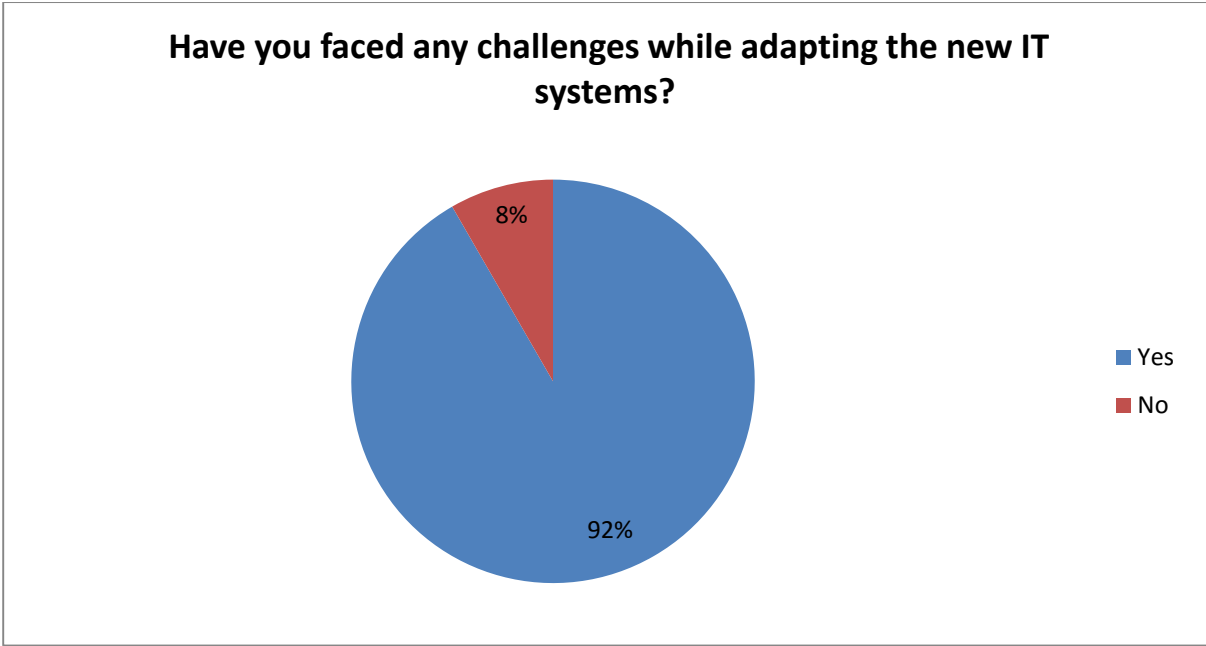


Figure 4. 45: Interviewees’ perception about the challenges faced while adapting to the new IT systems (bank A)

92% of employees stated that they faced challenges while adopting the new IT systems. But only one employee declared that there are no challenges while adopting the new IT systems.

Bank B

Table4. 47: Interviewees’ perception about the challenges faced while adapting to the new IT systems (bank B)

Yes	11
No	1

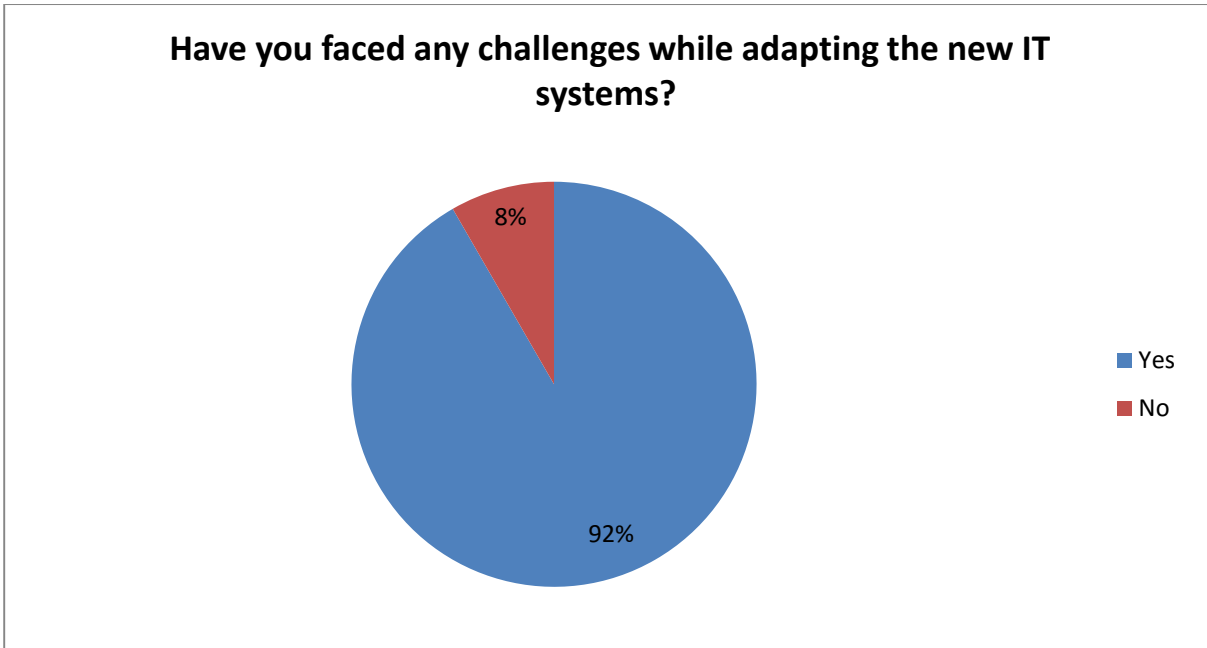


Figure 4. 46: Interviewees' perception about the challenges faced while adapting to the new IT systems (bank B)

92% of employees stated that they faced challenges while adopting the new IT systems. But only one employee stated that he/she did not face any challenges while adopting the new IT systems.

18. What are those challenges/ how did you overcome those challenges? (While adapting to the new systems)

Bank A

There are various numbers of challenges employees have to face while adopting to the new IT systems. Those are, knowledge not up to date, not having good knowledge about the new system, Familiarizing issues, slow working rate, time consuming to familiarize the problems, attitude issues and sometimes lack of domain knowledge. The most popular method to overcome above mentioned challenges is participating in the trainings. Some employees stated that self-learning and on the job trainings are the other options.

Bank B

There are various numbers of challenges employees have to face while adopting to the new IT systems. Those are adaptation issues, unable to identify the functions immediately, get

confused with the new functions, slow working speed during the familiarizing period, unable to give expected customer services during the transition period, defined paths are not working properly, some error messages are popping and out, and some compatibility issues. The most popular methods to overcome above mentioned challenges are participating in the trainings, contact IT department and get peer and superior support.

19. Does your bank offer you a sufficient IT training?

Bank A

Table4. 48: Interviewees’ perception about the trainings provided by the bank (bank A)

Yes	8
No	4

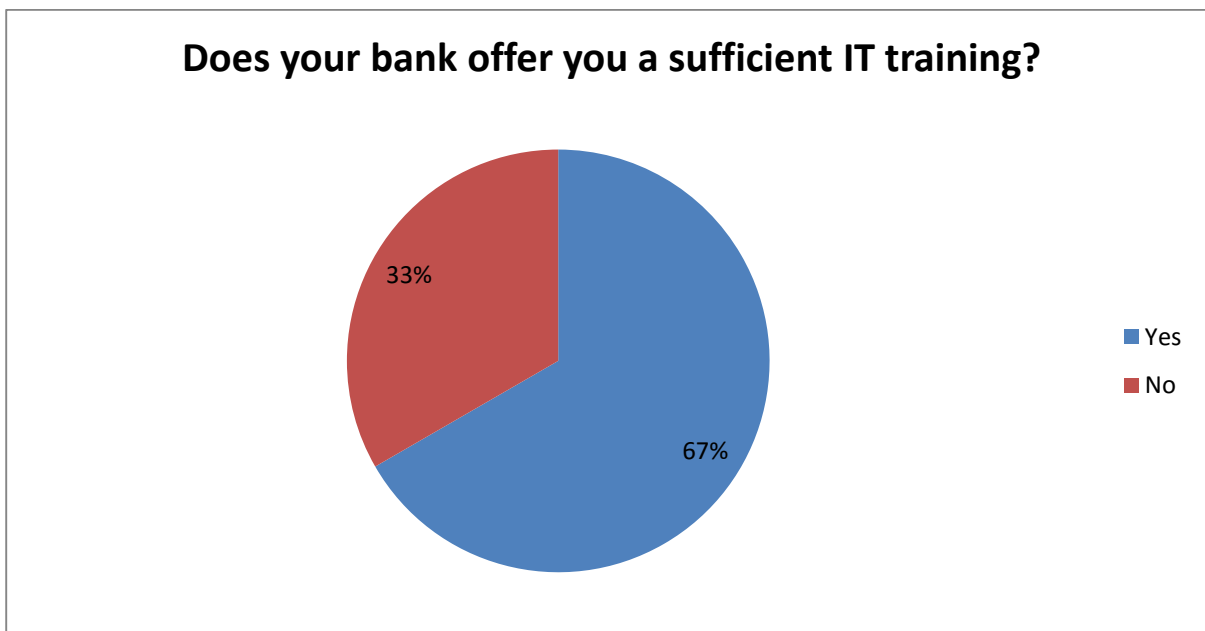


Figure4. 47: Interviewees’ perception about the trainings provided by the bank (bank A)

67% employees stated that the bank offers sufficient training for them. Meanwhile, 33% employees stated that the bank does not offer sufficient training for them. Some employees opined that the bank rarely repeats the same training and it would be great if the bank repeats the same training at least periodically. This is because, sometimes they were unable to participate in the trainings due to unavoidable circumstances

Bank B

Table 4. 49: Interviewees' perception about the trainings provided by the bank (bank B)

Yes	10
No	2

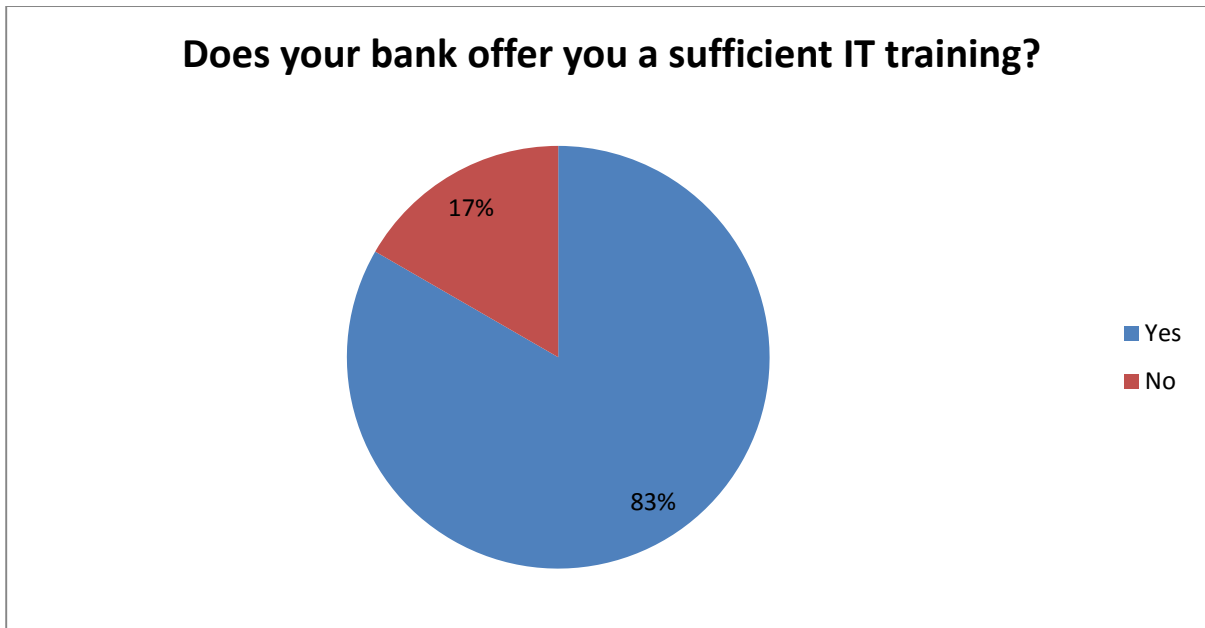


Figure 4. 48: Interviewees' perception about the trainings provided by the bank (bank B)

83% employees stated that the bank offers sufficient training for them. Meanwhile, 17% employees stated that the bank does not offer sufficient training for them.

20. Is there any process to measure your productivity, after implementing the IT systems?

Bank A

All the employees stated that, there is no any standard process to measure their productivity, after implementing the IT systems.

Bank B

All the employees stated that, there is no any standard process to measure their productivity, after implementing the IT systems.

21. Is there any process to evaluate your opinions and complaints about the new System?

Bank A

All the employees stated that, there is no any standard process to evaluate their opinions and complaints about the new System.

Bank B

All the employees stated that, there is no any standard process to measure their productivity, after implementing the IT systems.

22. If yes, what is that evaluating process? (to evaluate your opinions and complaints about the new System)

Bank A

All the employees stated that, there is no any standard process to evaluate their opinions and complaints about the new System.

Bank B

All the employees stated that, there is no any standard process to measure their productivity, after implementing the IT systems.

23. Are you getting the help you need in accessing newly implemented IT systems from your superiors/colleagues?

Bank A

All the employees stated that they are getting the help they need in accessing newly implemented IT systems from their superiors and colleagues. The majority of the employees first tries to solve the issue by themselves. If they unable to solve it that seek the help of their

colleagues, superiors and other branches. If it is a worst case scenario, they immediately contact the IT department or the help desk in the IT department.

Bank B

All the employees stated that they are getting the help they need in accessing newly implemented IT systems from their superiors and colleagues. Some employees first try to solve the issue by themselves. If they unable to solve it, they seek the help of their colleagues, superiors and other branches. Finally, they seek the support from their IT department if an issue continues.

24. Does IT department investigate your IT knowledge/related skills?

Bank A

All the employees stated that as per their knowledge the IT department does not investigate their knowledge and related skills before implement the IT systems.

Bank B

All the employees stated that as per their knowledge the IT department does not investigate their knowledge and related skills before implement the IT systems.

25. Is it important to investigate IT knowledge/related skills, before introducing the new IT systems?

Bank A

Table4. 50: Interviewees' perception about investigating IT knowledge/related skills, before introducing the new IT systems (Bank A)

Yes	11
No	1

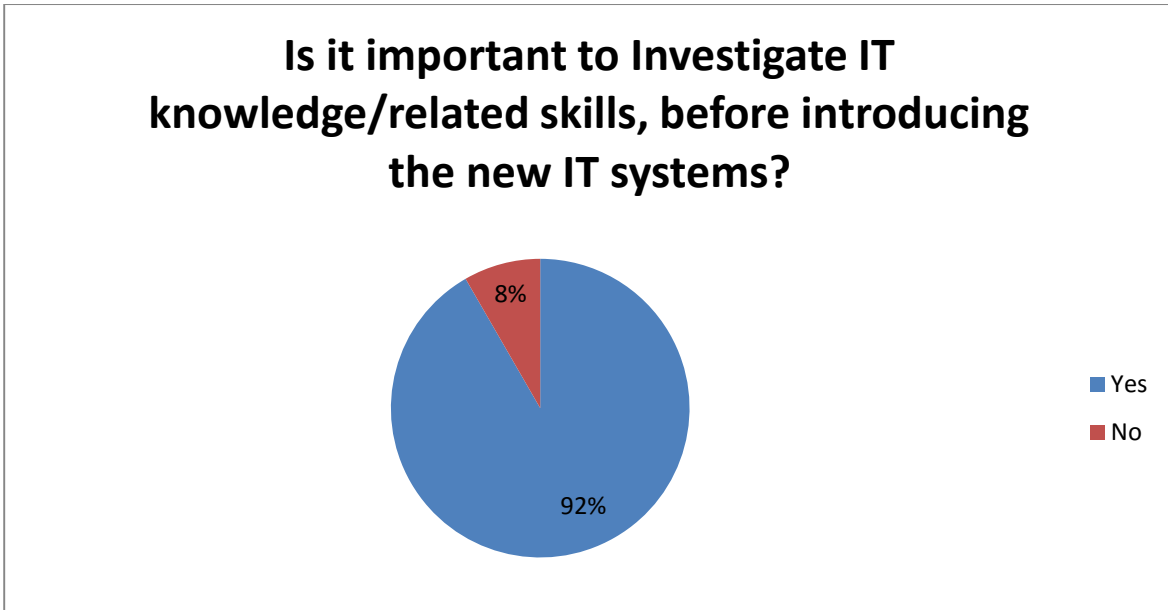


Figure4. 49: Interviewees' perception about investigating IT knowledge/related skills, before introducing the new IT systems (Bank A)

92% employees believed that it is important to Investigate IT knowledge/related skills, before introducing the new IT systems. Through the investigation the bank will be able to identify the actual knowledge level of the branch employees, arrange the proper trainings for them and ultimately awareness of the knowledge and skills will direct to the successful implementation of the systems. One employee stated that, in the bank there are 3 generations. Those are newly recruited employees, management trainees and traditional bank employees. It is better to investigate the knowledge of the first two generations. The last generation is reluctant to change and they do not want to familiar with new knowledge and technology. Some employees stated that it has some practical issues, because there are over 9000 employees. 8% of employees stated that it is not important to Investigate IT knowledge/related skills, before introducing the new IT systems. Furthermore, they stated that, as a bank employee they have to get the new knowledge to move further in the business.

Bank B

Table4. 51: Interviewees' perception about investigating IT knowledge/related skills, before introducing the new IT systems (Bank B)

Yes	10
No	2

Is it important to Investigate IT knowledge/related skills, before introducing the new IT systems?

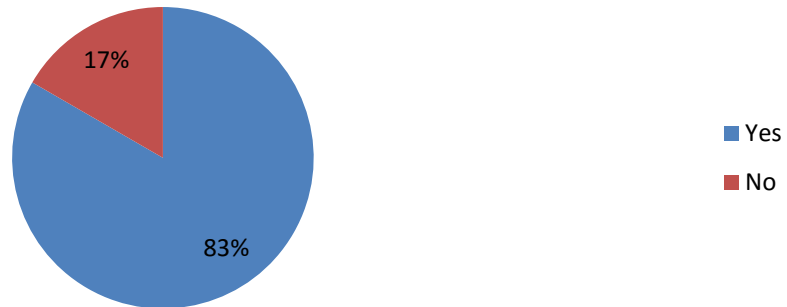


Figure4. 50: Interviewees' perception about investigating IT knowledge/related skills, before introducing the new IT systems (Bank B)

83% employees believed that it is important to Investigate IT knowledge/related skills, before introducing the new IT systems. Through the investigation, the bank will be able to get a proper idea about the It knowledge and skills about the employees, who is going to use new systems. Furthermore the bank will be able to identify the training needs and arrange proper trainings for them. But 17% of employees believed that it is not important to Investigate IT knowledge / related skills, before introducing the new IT systems. Furthermore, they stated that the IT department implements what they want without conducting prior investigations. Somehow they have to adopt those systems. One employee stated that the IT department has no time to investigate those skills and knowledge because; the number of users is high.

26. How your IT department responds to your complaints related to the IT systems?

Bank A

The majority of the employees stated that IT department responds to their complaints over the phone. If it is a major issue, they remotely log in to the system and resolve the issue. In severe cases, they visit the branch. Most of the employees have a negative image on IT department's responsiveness. Employees stated that IT department is very slow in responding to the complaints and sometimes the department does not take the complaints seriously.

Bank B

The majority of the employees stated that IT department responds to their complaints over the phone. If it is a major issue, they remotely log in to the system or visit the branch and resolve the issue. Some employees have a negative image on IT department's responsiveness. Employees stated that IT department is very slow in responding to the complaints. According to one employee, the IT department has no any proper subject knowledge about the business.

4.2.5. Training related questions

27. Have you attended trainings provided for IT systems? Were they useful?

Bank A

Except one employee, all the employees attend the trainings and they stated that those are useful. But one employee stated that she/ he rarely attend to the trainings, because, participation in the training depends on the situation of the branch. She/he cannot attend the training programs if there is no any employee to hand over the responsibilities. One employee opined that it is better to have a training parallel to the system implementation process. Otherwise, they cannot get the maximum results from the trainings. One employee stated that there are very few IT related trainings.

Bank B

All the employees attend the trainings and they stated that those are useful. But, one employee stated that those trainings are not useful. Because he/she can get only very basic knowledge of the system and their IT department is not endowed with a comprehensive knowledge of the system.

28. Through the training, did you learn all the things that related to the systems?

Bank A

An employee stated that she/he can obtain knowledge and skills through the training. The rest of the employees opined that only they can get the basic knowledge related to the systems. They can get the basic idea of functions of the systems. The rest of the knowledge they have to accumulate through the self-learning and on the job trainings.

Bank B

11 employees out of 12 stated that they did not learn all the things through the trainings. They can only get very basic knowledge about the new system and the functions of the system. They gather further knowledge through self-learning and on the job trainings. One employee stated that, he/she can get proper knowledge about the system through the trainings.

CHAPTER 05: Conclusion and Recommendations

5.1. Conclusion

The objectives of the research were to explore the critical success factors (CSF) related to employee skills and perceptions for ICT implementations in the banking sector and to conduct a perception gap analysis of banking employees at different levels for IT systems implementation processes. This research analyzed some critical success factors for IT system implementation process and some perception gaps between different levels of IT systems implementation process. The data collection process was done by using a direct interview method with the aid of questionnaires. First the writer used a comprehensive conceptual model to build up the questionnaire. The broad literature review was done to identify the most suitable models among the various types of models.

Every bank believes that it is very much essential to introduce IT systems because, IT considers as a critical factor to run a business and also they believe that they cannot survive without IT. Almost all the employees believe that investigating the IT knowledge and related skills before introducing IT systems is very essential and important. Furthermore, the bank will be able to reap the benefits such as get a proper understanding about the current knowledge/skill levels of the employees and take early remedies for shortage of related IT skills beforehand. Additionally, it reduces operational and maintenance issues. Finally the bank reaps the better output by assigning the right person to the right job. But according to the majority of the employees, the selected two banks are not conducting any investigation process beforehand. It is true that there may some practical issues like time constraint problems and large numbers of employees, but considering the outcome benefits of such implementation would be very much essential to the banks.

Most of the employees in the selected two banks have faced challenges while adopting the new IT systems. Those challenges, according to the senior management of the banks are employees reluctant to change from the comfort zone, lack of technical staff, user awareness and the time constraint, Implement the system to entire bank network, reluctant to change. But, according to the IT staff level employees, the adaptation challenges are, operational issues, Setting up the necessary infrastructure, performance issues, operations and scheduling issues, interfacing with other systems, setting up system parameters, User training, customization, Non availability of

data required by the new system, Knowledge not up to date and less knowledge regarding the new system. But it is clear that most of the listed adaptation challenges can be overcome by practicing an investigation process of the IT knowledge and related skills of the employees before introducing new IT systems

Though, it is essential to carry out a process to evaluate the opinion and complaints about the new IT system, the selected two banks have no any standard process. As per the IT implementation employees, there is a system, but that is not a standard system and it is also not practicing well by now. There are numbers of opinions and complaints about the new system, raised by the employees. They are, lack of business domain knowledge, lack of operational knowledge and lack of user friendliness. There are some other complaints about the new systems too. Those are, unnecessary delays of the systems, long transaction time of the new systems, Struggling with security aspects, users totally depend on the s/w and try to get the entire thing done automatically, complexity and mainly adapting issues, Lack of vendor support, Vendor's culture is not matching with the bank culture and customization issues of the new system.

When considering the list of opinions and complaints raised by the employees, it is essential to practice a standard procedure to gather the complaints and opinions. After the gathering process the IT department should establish a process to evaluate those received opinions and complaints from their employees.

The selected two banks are not practicing a standard process to measure the performance and the productivity after implementing the IT systems. It would be great if there is a system to measure their productivity after implement the new IT systems. Through the process the banks will be able to compare the new system with the past system according to the productivity and performance. Adding to that, it helps to increase the overall productivity of the system and the customer's satisfaction as well.

It is very essential that the number of functions of the new IT systems should be matched to the actual bank requirements. More functions of the new system will confuse the IT system users very easily. Before implementing new IT systems it is important to consider about the simplicity of the systems. The numbers of functions are not a matter if the requirement is important. The bank has to design the functions not to affect to the users' performance" but to reduce the complexity of the entire system.

After implementing the new system employees have to face various types of challenges and issues. Sometimes they have to refer additional documents and sources to gain more knowledge related to the new system. It is highly essential to implement a system for employees to get knowledge easily and quickly about the new IT systems, such as, external support, help desk support, internet and related circulars.

As a leading department of the bank, the IT department has to offer sufficient, timely and speedy services to the IT system user employees. If the IT department has weak responses about the IT system related complaints it will be affected to the entire banking system and the bank will be vulnerable to the customer dissatisfaction. But in the selected two banks the majority of the IT system user employees were not satisfied with the services provided by the IT department. It was not reflected that the IT department does not provide any services for the users. But, the services provided by the IT department are below the average level of IT system users expectations.

Considering the different levels of the IT implementation process there are some perception gaps in between the employees were identified through this research. Those perception gaps belong to trainings and responding to the complaints. When considering the perception gap of responding to the complaints, according to the IT implementation employees, after having several rounds of discussions within IT department and vendors they respond to the complaints. The IT user employees believe that the IT department has huge delays in responding to the users' complaints. So there is a perception gap in between two layers of employees in the implementation process has to narrow down.

The next perception gap belongs to training. The majority of the IT system implementation employees of the both banks stated that training is the proper source to overcome the adaptation challenges. But a reasonable number of the IT system user employees directly stated that the trainings provided by their bank are insufficient for them.

5.2: Recommendation

After analyzing the gathered data from the interviews (In chapter 4), this chapter will propose recommendations for successful IT system implementation process. Those recommendations are the critical success factors for the IT implementation.

5.2.1: Critical Success factors for IT system implementation

1. Do a prior Investigation about the IT knowledge/related skills of the employees before introducing the new IT systems. (If there is a practical issue, at least select a sample and continue the investigation)
2. Introduce a process to gather the opinions and complaints about the new Systems from the employees.
3. Establish a method within the IT department to evaluate the opinions and complaints received from the user employees about the new Systems.
4. Establish a performance and productivity measurement systems to compare the past and the new system.
5. Number of functions of the new IT systems should be matched to the actual bank requirements.
6. Introduce a system for employees to get knowledge easily and quickly about the new IT systems. Such as, external support, help desk support, internet and related circulars.
7. Evaluate the service quality provided by the IT department for the IT users' complaints. Such as online feedback forms and evaluation sheets.

5.2.2: Suggestions for the perception gaps of different levels of employees in IT system implementation process

IT implementation employees stated that they respond to the complaints after having several rounds of discussions while evaluating the change request forms. Furthermore, they stated that if it is a vendor base system, after having discussions with the vendor and respond to the complaints. But 50% of IT system user employees from bank A and 45% of IT system user employees from bank B were not satisfied the services provided by their IT department for the complaints. Furthermore, they stated that the IT department does not respond when they need any assistance (not answering the telephone), IT department has huge delays in attending to the complaints and most of the time the IT department have weak responses and only a few people in the IT department give help to them in time. To narrow down the perception gap, it is essential to practice the critical success factor 07.

The majority of the IT system implementation employees from both banks stated that training is the proper source to overcome the adaptation challenges. But 33% of IT system user employees of bank A and 17% of IT system user employees from bank B clearly stated that the trainings provided by their bank are insufficient for them. To minimize this perception gap the bank should practice the critical success factor o6, such as

Introduce a system for employees to get knowledge easily and quickly about the new IT systems. Such as, external support, help desk support, internet and related circulars.

5.3: Limitations

In this section limitations of the study are described briefly and limitations have been experienced due to various kinds of internal and external factors during the research project. Some of the identified limitations are as follows.

1. This research was only limited to two public banks and this could have to extend to other banks with additional survey effort.
2. The interview method was used only for the western province branches and it could be great to get participation of other provinces branches also.

5.4: Directions for future research

There are several possible future work related to this research. One future direction is, this study can be extended to rest of the banks and other financial institutions. The next future direction is the banks have many new IT systems those were isolated because of the implementation and adaptation issues. So, carrying out a research about above mentioned isolated IT systems and finding about the reasons behind those would be very advantageous for the entire banking sector.

5.5: Author's experiences in conducting interviews

The Chief Information officer in any organization is very vital and engaged in a challenging role. Huge responsibility is loaded on his/her shoulders and extraordinary management skills are required for handling those kind of challenging tasks. All the CIO's that interviewed had almost the same levels of qualifications and experience levels, but their attitudes and

perceptions were the changing factors. To the same question their answers had a wide difference. The ways they addressed and reacted the questions were reflected in their attitude about the IT level of their banks.

Some banks try to customize the systems according to their requirements and some are trying to do system integration. They have their own perceptions about that. The other thing was some CIOs tend to develop their IT system in-house and some are mentioning on the negative side of in-house developed systems by highlighting the positive side of the outsourcing systems.

Conducting interviews with IT implementation employees are easier than IT system user level employees. Because, IT system user level employees are always working with the customers and high amount of interferences was happening during the interviews. The success rate of the interviews is depending on the support given by the branch managers of the each branch to the interviewer.

5.6: Expert intuition

One of the most important areas of the research is validation of the research findings. Validation of the findings gives additional recognition and respect to the research. In this research, findings were validated through expert intuition. For the exploratory study, data were gathered from two public banks (Bank A and Bank B). So, it is important to select an expert from the public banking sector who does not belong to the above mentioned two banks. By considering those factors, an expert was selected from another large licensed state sector commercial bank in Sri Lanka. The expert is a well experienced chief manager working in the IT department of the selected bank.

The expert stated that the suggested CSFs for successful IT system implementation in this research are valid and also suitable for the People’s bank. In addition to that, he stated that those CSFs cannot be compared with the private banks. Because, there is a huge gap in between, public and private banks in Sri Lanka. Below table represents the expert’s views on each and every CSF.

Table5. 1: Expert’s comments on CSFs

CSF number	Expert’s comment on the CSFs
01	Definitely the IT Knowledge/ skills of the employee are a critical success factor. Therefore gap analysis should be done before implementing the

	system and training plan need to be developed accordingly. However, this factor should not be a hurdle to get decision to introduce new IT solutions.
02	Yes. It is a CSF
03	This part also can include to the process which mention in CSF 02.
04	Yes, It is a CSF. This should be done before the new system implement. This should be included in the vendor selection process. If the performance is lesser than the current system, it should be treated as a negative factor when selecting the new system. However, performance issue arisen due to the regulatory requirements, then it cannot be ignored
05	Yes. It is a CSF
06	Yes. It is a CSF
07	Yes. It is a CSF

Finally, the expert stated that, there is a high possibility to occur perception gaps in between IT system implementation employees and IT system user employees regarding to responding to the complaints and trainings.

Appendix 01

Questionnaire 01 for CIO's/Heads of IT of the banks

Area	Question
Perceived Ease of Use	<ol style="list-style-type: none"> 1. Do you find that, it is easy to get ICT systems, to do what the employees want to do? 2. Do you believe that learning and operate new ICT systems are easier for your employees than subsequent systems? Why?
Perceived usefulness	<ol style="list-style-type: none"> 1. After implementing the systems, do you evaluate the opinions and a complaint of the employees who are using it? 2. What are the most common complaints and opinions about the newly implemented systems? 3. How your IT team responds to those complaints? 4. Do you believe that ICT systems enhance the employee's performance? What are the indicators for that? 5. How do you measure the employee's productivity, after implementing the ICT systems into your bank?.
General	<ol style="list-style-type: none"> 1. According to your perception, how you feel about introducing ICT systems to your bank? 2. What type of idea do you have about your bank employee's IT literacy level? 3. What are the strategies do you take to overcome the lack of the literacy level of your employees for newly implemented IT systems? 4. What are the prior investigations that you do about your employees, before introducing the new IT system? 5. What are the challenges you and your IT team have to face while implementing the IT systems

Appendix 02

Questionnaire 02 for IT system implementation employees

General Questions (Demographic, educational and professional)

1. What is your age group? (25-34) (35-44) (45-54) (55+)
2. What are your qualifications you have achieved in IT field?
(BSc./MSc./MBA/PG.diploma/Other)
3. Is it important to Investigate IT knowledge/related skills, before introducing the new IT systems? Why?
4. Do your superiors investigate IT knowledge/related skills of employees?
5. Have you faced any challenges while adopting the new IT systems? (Yes/No)
6. What are those challenges/ how did you overcome those challenges?
7. Do you plan to change your career path in the future? (Yes/No)
8. What is your future plans related to your IT skills enhancement?

Perceived usefulness

2. Is there any process to evaluate the opinion and complaints about the new System?
(Yes/No)
3. What is that evaluating process?
4. What are your most common complaints and opinions about new systems?
5. How your IT team responds to those complaints raised by yourself?
6. Do you believe that IT systems enhance your performance? If yes, How? If no, Why?
7. Do you feel that your productivity is increasing while working with new IT systems?
8. Is there any process to measure employee productivity, after implementing the IT systems?

Perceived ease of use

6. Do you find that, it is easy to get IT systems, to do what you want to do?
7. Do you believe that learning and operating new IT systems are easier for you than past systems? Why?

Task technology fit

1. How do you feel about having more functions in new IT systems? (Task Characteristics)
2. Have you frequently dealt with ad hoc and non-routine (complex) problems while working with new IT systems (Task Characteristics)
3. What are those problems?
4. Are you getting the help you need in accessing newly implemented IT systems from your superiors? (Technology characteristics)

5. Can you get knowledge easily and quickly about the newly implemented IT system when you need it? (Technology characteristics)
6. Are there any technical issues arising frequently in your current working IT systems?

Future planning

1. What do you think about the new areas that would help your bank more effectively use IT?
2. How do you think that the bank can use existing data to better plan future activities?
3. Do you need new functionalities in the existing IT systems to facilitate these future plans?

Appendix 03

Questionnaire 03 for IT system user employees

General Questions (Demographic and educational)

1. What is your age group? (25-34) (35-44) (45-54) (55+)
2. What are your educational qualifications? (BSc./MSc./MBA/PG.diploma/Other)

Perceived usefulness

3. How useful are the existing IT systems for your day to day works?
4. Have you felt the need of any other systems than the existing IT systems?. If so, what are those systems?
5. Are there any technical issues arising frequently in your current working IT systems?
6. What are your most common complaints and opinions about IT systems?
7. Do you believe that IT systems enhance your performance? If yes, How? If no, Why?
8. Do you feel that your productivity is increasing while working with new IT systems?

Perceived ease of use

9. Do you find that, it is easy to get IT systems to do, what you want to do?
10. Do you believe that learning and operating new IT systems are easier for you than past systems? Why?

Task technology fit

11. How do you feel about having more functions in new IT systems?
12. Have you dealt with problems while working with new IT systems?
13. What are those problems?
14. How did you overcome those Problems?
15. Are you satisfied with the services provided by the IT department?
16. Can you get knowledge easily and quickly about the newly implemented IT system when you need it?

General Questions (profession)

17. Have you faced any challenges while adopting the new IT systems? (Yes/No)
18. What are those challenges/ how did you overcome those challenges?
19. Does your IT department offer you a sufficient training? (Yes/No)
20. Is there any process to measure your productivity, after implementing the IT systems?
21. Is there any process to evaluate your opinions and complaints about the new System? (Yes/No)
22. If yes, what is that evaluating process?
23. Are you getting the help you need in accessing newly implemented IT systems from your superiors/colleagues?
24. Does IT department investigate your IT knowledge/related skills?

25. How your IT department responds to your complaints related to the IT systems?
26. Is it important to Investigate IT knowledge/related skills, before introducing the new IT systems? (Yes/No) Why?

Training related questions

27. Have you attended trainings provided for IT systems?. Were they useful?
28. Through the training, did you learn all the things, that related to the systems?.
29. How do you handle the problems which you came across in daily operations?

References

- Agbolande, O. K. (2011). Information and communication technology and banks profitability in Nigeria. *Australian Journal of Business and Management Research*, 1(4), 102-107. Retrieved from <http://www.ajbmr.com/articlepdf/ajbmr01n0411.pdf>
- Aliyu, A. A., & Tasmin, R. B. H. (2012). The Impact of Information Technology on Bank's Performance and Customer Service Delivery in the Banking Industry. *International Journal of Latest Trends in Financial & Economic Sciences*, 2(1), 80-90.
- Ashrafi, R., & Murtaza, M (2008). Use and Impact of ICT on SME in Oman. *Electronic Journal Information systems Evaluation*, 11(3), 125-138.
- Barnes, S. J. & Corbitt, B. (2003). Mobile banking: Concept and potential. *International Journal of Mobile Communications*, 1(3), 273-288.
- Dangolani, S. K. (2011). The Impact of Information Technology in Bnaking System (A case Study in Bnak Keshavarzi IRAN).*Procedia-Social and Behavioral Sciences*, 30, 13-16.
- Davis, F.D., Bagozzi, R.P. & Warshaw, P.R, (1989).User Acceptance of Computer Technology: A Comparison of Two Theoretical Models, *Management Science*, 35(8), 982-1003.
- Dillon, A., & Morris, M. (1996). User acceptance of new information technology: theories and models. *Annual Review of Information Science and Technology*, 31, 3-32. Retrieved from <https://www.ischool.utexas.edu/~adillon/BookChapters/User%20acceptance.htm>
- Dishaw, M.T., & Strong, D.M. (1999). Extending the technology acceptance model with task–technology fit constructs. *Information & management*, 36(1), 9-21.

Dishaw, M.T., Strong, D. M., & Brandy, D.B. (2002). Extending the task-technology fit model with self-efficacy constructs. *Journal of Human-Computer Interaction Studies in MIS*, 1021-1027. Retrieved from http://melody.syr.edu/hci/amcis02_minitrack/RIP/Dishaw.pdf

Goodhue, D.L., & Thompson, R.L., (1995). Task-technology fit and individual performance. *MIS quarterly*, 213-236.

Johar, M. G. M., & Awalluddin, J. A. A. (2011). The Role of Technology Acceptance Model in Explaining Effect on E-Commerce Application System. *International journal of Managing Information Technology (IJMIT)*, 3 (3). Retrieved from <http://airccse.org/journal/ijmit/papers/3311ijmit01.pdf>

Lai, V. S., & Li, H. (2004). Technology acceptance model for internet banking: an invariance analysis. *Information and Management*, 42, 373-386. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0378720604000382>

Legris, P., Ingham, J., & Collerette, P. (2001). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management*, 40, 191-204. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0378720601001434>

Luka, M.K. (2012). The Impacts of ICTs on Banks. *International Journal of Advanced Computer Science and Applications*, 3(9). Retrieved from http://thesai.org/Downloads/Volume3No9/Paper_21The_Impacts_of ICTs_on_Banks.pdf

Lymperopoulos, C., & Chaniotakis, I. E. (2004) Branch employees' perceptions towards the implication of e-banking in Greece. *International journal of Retail and Distribution Management*, 32(6), 302-311.

Maldeni, H. M. C. M., & Jayasena, S. (2009). Information and communication technology usage and bank branch performance. *International Journal on Advances in ICT for Emerging Regions (ICTer)*, 2(2).

Miller, R.L., & Brewer, J.D. (2003). *The A-Z of social research*. London: SagePublication

Nasri, W., & Charfeddine, L. (2012). Factors affecting the adoption of Internet banking in Tunisia: An integration theory of acceptance model and theory of planned behavior. *The Journal of High Technology Management Research*, 23(1), 1-14.

Onay, C., & Ozsoz, E. (2013). The Impact of ICT-Banking on Brick and Mortar Branches: The Case of Turkey. *Journal of Financial Services Marketing*, 18 (4). Retrieved from <http://link.springer.com/article/10.1007/s10693-011-0124-9#/page-1>

Park, S. Y. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. *Educational Technology and Society*, 12(3), 150-162. Retrieved from http://www.ifets.info/journals/12_3/14.pdf

Selsmat, Z., Jaffar, N., & Ong, H. (2009). Technology acceptance in Malaysian banking industry. *European Journal of Economics, Finance and Administrative Sciences*, 17. Retrieved from https://www.researchgate.net/publication/239587726_Technology_Acceptance_in_Malaysian_Banking_Industry

Seyal, A. H., & Rahman, M.N.A, (2009). An Extension of The Technology Acceptance Model: The Case of Bruneian Managers, *Asian Journal of Business and Accounting*, 2 (1), 25-45.

Shaoyi, L., Yuan P. S., Huaiqing, W. & Ada, C. (1999). The adoption of virtual banking: an empirical study. *International Journal of Information Management*, 19, 63-74.

Suraweera, T., Kahingala, S., Batepola, A., Punchihewa, M., Senevirathna, K., & Kahandawaarachchi, C. (2011). IT Driven Banking Services in Sri Lanka: Customer Acceptance and Service Quality

Tan, M. & Teo, T. S. H. (2000). Factors influencing the adaptation of internet banking. *Journal of the Association for Information Systems*, 1(5),

Tiwari, R., & Kumar, R. (2012). Information Technology in Banking Sector, *Asia Pacific Journal of Marketing and Management Review*, 1(1).

Uwizeyemungu, S., & Raymond, L. (2011). Information Technology Adoption and Assimilation: Towards a Research Framework for Service Sector SMEs. *Journal of Service Science and Management*, 4. 141-157. Retrieved from <http://www.SciRP.org/journal/jssm>

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Intervention. *Decision Sciences*, 39 (2). Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.2008.00192.x/pdf>

Venkatesh, V., & Davis, F.D. (1996). A Model of the Antecedents of Perceived Ease of Use: Development and Test. *Decision Sciences*, 27(3). Retrieved from http://www.vvenkatesh.com/Downloads/Papers/fulltext/pdf/1996%283%29_DS_Venkatesh_Davis.pdf

Zaman, F. & Chowdhury, P. (2012). Technology driven banking in Bangladesh: Present status, future prospects and challenges. *BUP Journal*, 1(1), 56-78.