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OptiQ Queue Management System of State Bank of India, Chandigarh: A Brief Analysis

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Abstract-This study analyses the various aspects of the queue management system installed at the State Bank of India's branch in Panjab University, Chandigarh. It explains the working of the QMS undertakes analysis of the customers and employees perceptions about the QMS. Data from published sources of the bank were used to understand the working, self administered likert scale questionnaires were used to record perceptions of randomly selected customers and employees. Four significant factors affecting the customers' perceptions were extracted using factor analysis. These factors were customer welfare, orderliness, technical aspects and ambience. Significant associations were identified using the chi square tests. A sample size of 50 customers and 5 tellers was used for the perceptual study objectives.

Applicative value: This study will help in the development and use of queue management systems. The significant factors affecting the perceptions of the customers should be taken care of to improve customer satisfaction. The significant factors extracted will help develop a scale also.

Keywords: **OptiQ, Queue Management System, Intellvisions Software Limited, Aurionpro Solutions Limited, State Bank of India, Panjab University, Chandigarh, Queues at banks.**

1. INTRODUCTION

1.1 Queuing

Queuing is a common phenomenon in daily life. Queuing is the process of waiting in a line in the queue area for availing first come, first served goods and services. For instance, banks have customers in line to get service of teller and cars queue up for re-filling at the petrol station. Queues are experienced universally at various places like post offices, amusement parks, hospitals, supermarkets, restaurants, or wherever the product/service providing counters are lesser than the people availing the product/service. Physical queues are formed when people stand one behind the other in a queue area. Virtual Queues are created when people wait in a waiting room and remember their place in the queue, or report to a desk and sign in, or take a ticket with a number from a machine.

1.2 Queue Management System

A queue management system is used to control queues. It is a part of crowd management. Queuing is not desirable by the customers and it leaves a negative impression of service so, there is a need to manage queues with a proper queue management system. Thus it is essential rather imperative to have a good queue management system.

When a new customer arrives, the QMS accepts the inputs as the type of service required by the customer and other relevant details. It allows the customer do other things while the system saves his/her place in line. While waiting in the virtual queue, the customer is free to go about his business. When it is the customer's turn, he will receive a notification in the form of a number being displayed or announced, a text message, or in person. It also provides information reports for management and decision making. A modern digital queue management system is based on queue management algorithms, manages customer flows, eliminates queues and measures KPIs electronically.

1.3 State Bank of India: Corporate Profile

State Bank of India (SBI) is an India-based public sector commercial bank. The Company's banking activities include Personal Banking, Agricultural/Rural, NRI Services, International Banking, Corporate Banking and Services. The Personal Banking offers deposit schemes, personal finance, gold banking and services, while Agricultural/Rural activities provide micro credit, financial inclusion schemes and supporting Regional Rural Banks. The NRI services offer remittances, investments, loans and deposits facilities to NRIs. The International Banking provides correspondent banking, wholesale banking, global trade services and remittances. The Corporate Banking offers project finance, working capital, leasing, loan

syndication and other services. The other services that run through various offerings of the Company are internet banking, mobile banking, ATM services, demat services and other fee based services. Through its subsidiaries and associates, it also has presence in mutual fund and insurance sector. (Reuters)

State Bank of India (SBI), with a 200 year history, is the largest commercial bank in India in terms of assets, deposits, profits, branches, customers and employees. State Bank of India is an Indian multinational banking and financial services company. It is a corporation owned by the Government of India and has its headquarters in Mumbai, Maharashtra. As on December 2013, it had assets of US$388 billion with 17,000 branches which includes 190 foreign offices, that makes it the largest banking and financial services company in India by assets. It is one of the Big Four banks of India, along with ICICI Bank, Punjab National Bank and HDFC Bank. SBI provides a range of banking products through its network of branches in India and overseas, including products aimed at non-resident Indians (NRIs). SBI has 14 regional hubs and 57 Zonal Offices that are located at important cities throughout India. (Wikipedia)

The origins of State Bank of India date back to 1806 when the Bank of Calcutta (later called the Bank of Bengal) was established. On 27 January, 1921, the Bank of Bengal and two other banks (Bank of Madras and Bank of Bombay) were amalgamated to form the Imperial Bank of India. On 1 July 1955, the Reserve Bank of India acquired the controlling interests of the Imperial Bank of India and SBI was created by State Bank of India Act, 1955 of Parliament to succeed the Imperial Bank of India. I was nationalized on 2 June 1956. According to its slogan, it is "*The Banker to Every Indian*"

SBI is one of the largest employers in the country having 222,033 employees as on 31 March 2014, out of which there were 45,132 female employees (20%) and 2,610 (1%) employees with disabilities. On the same date, SBI had 42,744 Schedule Caste (19%) and 17,243 Schedule Tribe (8%) employees. The percentage of Officers, Assistants and Sub-staff was 36%, 46% and 18% respectively on the same date.

State bank of India's Panjab University Branch has five officers, 16 clerks and 5 subordinate staff. It was set up 50 years ago. It has 30,000 savings account customers, deposits of more than Rs. 725 crore and has extended loans up to Rs. 75 crore. The Queue management system was implemented in seven State Bank of India branches in the city of Chandigarh- sector 17, 31, 30, 34, 7, 41 and PGIMER. The branch visits made to these branches evidently show that Panjab university branch of State Bank of India is using the QMS more successfully than the others.

1.4 Rationale of the study

Customers don't like to stand wastefully in long queues nowadays. They expect an efficient queue management system as the customers at a bank have serious business to transact. The Indian banking industry is a competitive market. Every bank is working hard to improve their customers' experience. Queue Management is becoming the norm. Being able to measure KPIs (key performance indicators), such as waiting times and transaction times, is also becoming popular. The Indian banks have started using this modern initiative. As queue management system is a new concept in Indian banking industry, there is a vital need to study the system in order to evaluate its effectiveness, identify the bottlenecks and suggest the required improvisations in the queue management systems being used.

This study has been undertaken to understand the recently installed modern queue management system at the State Bank of India, Panjab University branch located in Chandigarh. The Panjab University branch of State Bank of India started using OptiQ on 29 January, 2015. Thus this study is a half yearly analysis.

1.5 Objectives of the study

1.5.1. To understand the working of the OptiQ queue management system.

1.5.2. To identify all the main factors that influence the customer's perception of the queue management system at bank (factor analysis)

1.5.3. To identify the significant associations of customers' gender, age, educational qualification and net promoter score (NPS) with of the factor variables extracted.

1.5.4. To identify the significant associations of employees' age, gender and educational qualification with stress, productivity, satisfaction and usage of QMS. These associations would help predict the employees' perceptions about the queue management system.

2. REVIEW OF LITERATURE

Most of the literature available about queue management systems aims at scheduling algorithms and queuing theory.

Avasthi & Sharma (2000-01) analyzed that advances in technology are set to change the face of banking business. Technology has transformed the delivery channels by banks in retail banking. It has also impacted the markets of banks. Padhy, K.C. (2007) stated that technological developments can result in core competencies which provide comparative advantages.

Janki (2002) analyzed that technology is affecting the employees' productivity. In India particularly public sector banks will need to use technology to improve operating efficiency and customer services. The focus on technology will increase like never before to add value to customer services. The study concludes that technology is the only tool to achieve the goals of public sector banks in India.

Bhasin (2001) analyzed the impact of IT on banking sector. It has transformed the repetitive and overlapping systems and procedures into simple single key pressing technology resulting in speed, accuracy and efficiency of conducting business.

Husain (1988) stated that in the introduction of any new technology or system various organizational, financial and functional problems are faced in the initial stages. People are generally reluctant to accept new system, howsoever beneficial it may be. State Bank of India is also facing such early stage problems in implementation of the digital queue management system.

The contours of banking are being redefined. The key to survival of banks therefore is retention of customer's loyalty by providing them with value added services tailored to their needs. (Pathrose, 2001)

Queuing is the process of moving customers in a specific sequence to a specific service according to the customer's need. To avoid standing in a queue for a long time or in a wrong line, most banks use automatic queue system to give tickets to all customers. The customer can push a specific button in a tickets supplier device according to their needs. The scheduling algorithm is used to order the customers and to choose the next customer from the queue (Jumaily & Jobori, 2011).

(Bose, 2002) (Mohamad, 2007)The most common scheduling algorithms:

- FCFS (First Come First Serve): The customers are served in the order of their arrival, which is most visibly fair because all customers think of themselves as equal.
- RSS (Random Selection for Service): In this algorithm, customers are selected for service at random, so each customer in the queue has the same probability of being selected for service irrespective of his/her arrival in the service system.
- PRI (Priority Service): The customers are grouped in priority classes according to some external factors. The customer with the highest priority is served first.
- SPF (Shortest Processed First): The algorithm assumes that the service times are known in advance. When several customers are waiting in the queue, the SPF algorithm picks the shortest service time first.

Queuing theory is basically a mathematical approach applied to the analysis of waiting lines. It uses models to represent the various types of queuing systems. Formula for each model indicates how the related queuing system should perform, under a variety of conditions. The queuing model are very powerful tool for determining that how to manage a queuing system in the most effective manner. The queuing theory is also known as the random system theory, which studies the content of: the behavior problems, the optimization problem and the statistical inference of queuing system Queuing theory explains the analysis of some communication, logistic, manufacturing and services. The main advantage of queuing theory resides in determining the important information about waiting times, arrivals and service stations characteristics and about the systems discipline.
(Xiao et. al., 2003)

One of the factors influencing consumers' perception on service quality is the efficiency of waiting systems. The waiting time is inevitable in the case of random requests. Thus, providing the capacity for a sufficient service is needed, but it is involving high costs. This is the premise from which the queuing theory starts in designing service. In the management terminology, a waiting line is also called the tail and their characteristic concepts form the queuing theory. (Xiao et. al., 2003)

Managing long queues during peak business hours has always been a huge problem for banks. Long queues are a big alarm sign for banks and also for the customers. They explain the quality of service and company's initiative for improving the customer's experience. In retail banking industry, queuing

remains one of the most common reasons for customer disgust. Despite technological advances such as online and mobile banking, customers still complain about their bank. Though many alternative delivery channels like E-lobbies, self service kiosks, internet banking, etc. have been introduced, brick and mortar offices are inevitable as they have their own importance for the customers. (suha Abu-ghosh, 2015)

A bank faces many unique issues. Banks have a limited number of counters because of resource constraints like branch premises or the available human resources. The worst scenario for them is not only having a queue, but having unmanned counters at the time of a queue. Few companies have entered the niche market for providing queue management systems specially designed for banks. These QMS allow their client banks to reduce queue lengths and increase staff productivity and operational efficiency. In recent years, the banking industry has transformed and banks are now competing for a higher share of customers' wallet. To achieve this motive, banks are trying to provide exceptional service with a delightful customer experience. (Shim and Siegel, 1999)

3. RESEARCH METHODOLOGY

3.1. Scope of the study

The study is based on the queue management system used at Panjab University branch of State Bank of India in Chandigarh. The chosen branch is assumed as the best representative bank office. It is a half yearly analysis. The study is done with a management perspective, and technical software development details are not under the purview of the study. The participants in the study are the customers, tellers/ employees and the mangers of the selected bank branch.

3.2. Research design

The study follows a proper sequence of steps throughout. The Figure 1 explains the research design followed. The review of literature formed the foundation for understanding the concept of queue management system and the participants using the system. This helped to make structured questionnaires for the customers and employees and a schedule for structured interview with the chief manager of the bank. A pilot study was done for the questionnaire for the customers with a random sample of ten respondents.

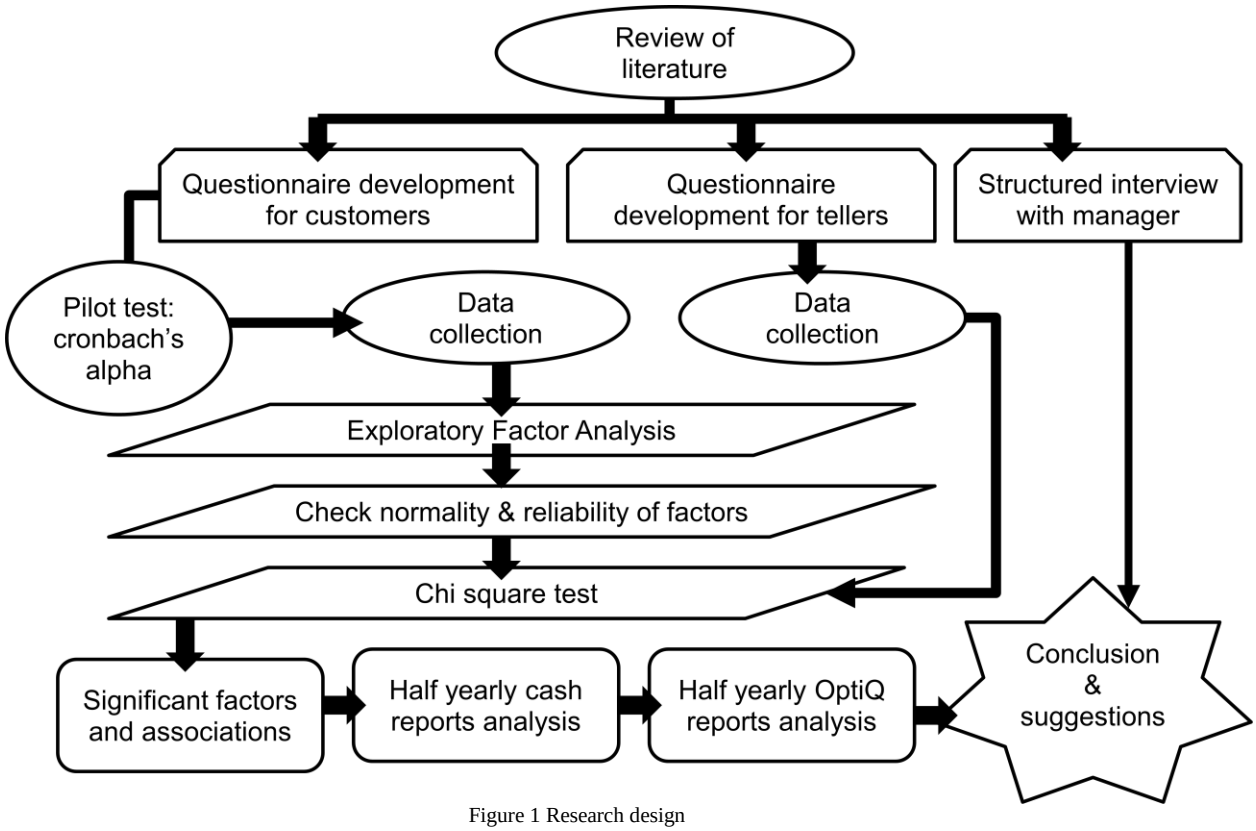

Figure 1 Research design

3.3 Sampling technique and sample size

The primary data has been collected from the customers and employees through questionnaires. Simple random sampling technique was used. Assuming a daily customer flow of 17000 customers on an average (total tickets distributed by OptiQ for the third week of June'15 was 1705), the sample size of customer respondents was 50 denoting a confidence interval of 2.75 (confidence level 95%). The total number of tellers are 7 and responses of 5 tellers/employees have been collected indicating a confidence interval of 5.04 (confidence level 95%).

3.4 Statistical tools for analysis

A self administered structured questionnaire based on 5 point likert scale was used to record the responses of customers and employees of the selected bank branch. The questionnaire for the customers had seventeen variables and three covariates. The questionnaire for the employees/tellers was based on four variables: stress, productivity, usage and satisfaction with three items each, and three covariates.

The information collected by the questionnaire was entered in IBM SPSS Statistics. Data analysis was done by applying various statistical tests like chi square. Factor Analysis is the statistical tool that has been used for data analysis. Cronbach's alpha was used as a test of reliability of the scale.

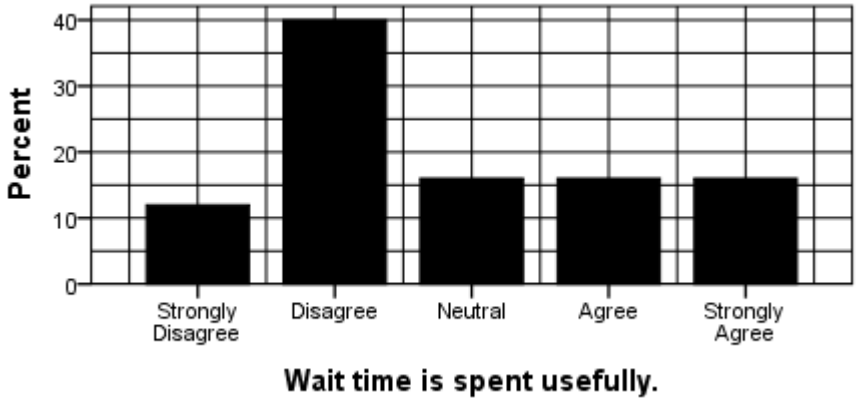

Figure 2: Bar diagram showing disagreement on spending wait time usefully.

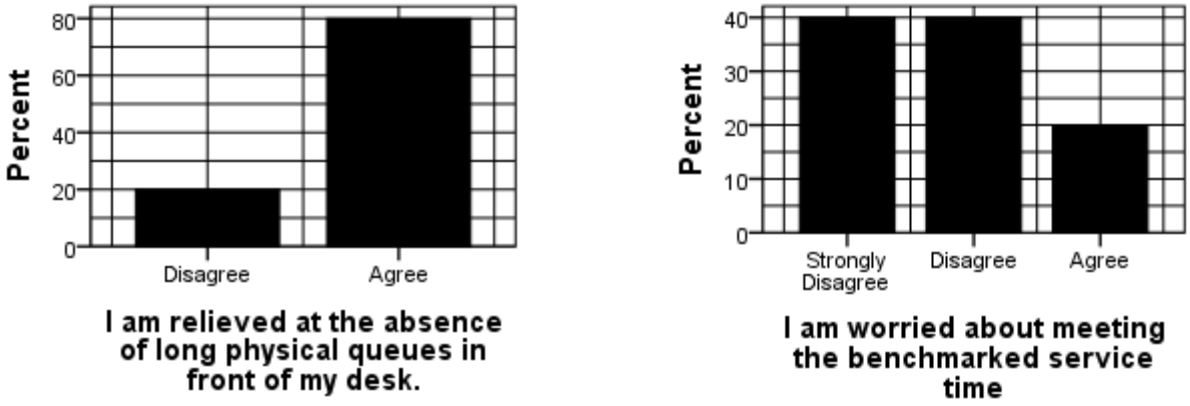

Figure 3: Notable deviations of responses by employees

6. LIMITATIONS AND FUTURE SCOPE FOR RESEARCH

This study is not free from flaws. The sample size is small. The study was conducted in the month of June. That is the time of summer break. The customer flow is less compared to other times of the year. A comparative study can be undertaken to compare the different queue management systems of different banks. A comparative study can be done among the other State Bank of India branches where OptiQ has been implemented. A year on year comparison would give more reliable results. The present study is a half yearly analysis. Regression analysis could provide projected results for future planning.

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