

The Impact of Management Information System on Service Quality

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Abstract

The major aim of the research paper is to measure the impact of management information system on service quality in commercial banks. Primary data has been collected from the bank employees in Manmunai North and Kattankudy divisional secretariat areas in Batticaloa District. Stratified random sampling was used to obtain 225 responses from employees of banks. The collected data were used to test the model using regression and path analysis methodology. The result reveals that the information quality, employee IS characteristics and technical support influence the service quality in a positive manner but only through employee IS performance. At the same time, the system quality alone influences the service quality directly and indirectly through employee IS performance. Further, the results suggest that employee IS performance contributes more to service quality with system quality.

Key words: Management Information System, Employee Information System Performance and Service Quality

1. INTRODUCTION

As the importance and size of the service sector of the global economy grows, the study of services is becoming increasingly important. With the aim of sustaining long term relationships with their customers, many businesses have changed their strategic focus to emphasize customer retention (Peng & Wang 2006). Preserving their long term customer relationships requires that these businesses both measure and appropriately adjust the quality of their customer service. Service organizations are continuously endeavouring their quality of service, as it is of paramount importance to them (Berry and Parasuraman, 1997). In Global scenario, the improvement in the service quality is becoming a competitive weapon to avail comparative advantages in the market.

Banks are the most important institutions in the chain of financial system in a country, it plays vital roles in the financial sector, not only in terms of turnover, profit and employment, but also it has impact on all functional areas of the economy. Therefore, providing effective services by banks to the nation are necessitated with the growing economy due to the rapidly advancing Information System (IS). Since the units in

banking industry are dealing with the similar products, they should show their identity in the market. Hence, they are investing more on the development and implementation of the IS at their banks in order to provide better service quality. In this context, the banks in Sri Lanka are also not exceptional. Recent development in IS Technology is a driving force to change the service quality of banks.

A company's IS composes of multiple components corresponding to different organizational units. Information system is highly useful to data processing, information storage, and retrieval of those data for analyses and managerial decision making. In any decision making process, information has become the source, which especially, is used heavily in the banking sector. Management Information System (MIS) is utilized by banks so that they can handle their diversified banking business efficiently.

2. RESEARCH PROBLEM

This study focuses on how the Management Information System (MIS) has the impact on service quality in commercial banks. As MIS is a multidimensional measure, it is important to determine what dimensions of MIS are critical to banks. Pratyush and Berg (2003)

indicated that there are 4 dimensions of Management Information System; system quality, information quality, employee IS characteristics and technical support. Vannirajan and Manimaran (2009) also indicated that the MIS dimensions such as system quality, information quality, employee IS characteristics and technical support influence the service quality in a positive manner. They further indicated that the system quality, information quality and employee IS characteristics influence the service quality in a positive manner but only through employee IS performance and at the same time, the technical support alone influences the service quality directly.

This scenario in turn may question about the impact of MIS on service quality. This study addresses this as an issue for investigating the relationship between Management Information System (MIS) and service quality, thus questioning in general:

“Whether Management Information System has a direct positive impact or indirect positive impact on service quality?”

3. RESEARCH OBJECTIVE

- To observe the level of impact of Management Information System (MIS) on service quality of commercial banks in Batticaloa district.

4. LITERATURE REVIEW

4.1 Service Quality

Consumers are increasingly aware of the alternatives on offer in relation to services and also of rising standards of service in the present competitive environment that changes every day. Consequently expectations rise and consumers become more critical of the quality of service (Vannirajan and Manimaran, 2009). Though services are considered to be the center of economic activities in the modern world and have been present in society since the origins of social life, studies into service quality and the introduction of this subject on the agenda of managers and employees are recent. Narasimhaiah, Toni and Betty (2010) define service quality as the degree of discrepancy between customers' normative

expectations for service and their perceptions of service performance. Reeves and Bednar (1994) define the service quality as the extent to which a service meets the expectations of customers.

4.1.1 Service Quality in Banks

A vast number of studies were used to identify the significance of service quality in banks. Good service quality is generally regarded as a way to retain existing customers and acquire new ones, reduce costs, enhance corporate image, generate positive word-of-mouth recommendation, and improve profitability (Berry, Bennet and Brown, 1989; Cronin, Brady and Hult, 2000; Kang & James, 2004; Reichheld & Sasser, 1990; Rust & Zahorik, 1993; Yoon & Suh, 2004). As the global world has suffered from financial depression in recent years, it is essential for banks to establish a sturdy and solid loyal customer base to weather tougher economies and more intense competition. The practice of excellent service quality integrated with consumer products is a powerful generator to cater to customers' needs and engage with them. Considering that many banks offer undifferentiated products in a rival marketplace, banks are paying more attention to service quality in order to gain competitive advantage. Banks that master service quality can gain a competitive edge in terms of higher revenue, customer loyalty and customer retention (Kumar, Kee and Charles, 2010).

Narasimhaiah et al. (2010) found out that the impact of service quality can be understood from the impact of a firm's service quality on the firm performance. Delivering quality service is a prerequisite for business success that leads to customer loyalty, higher profitability, lower cost (Grant, 1989), higher revenues (Reichheld and Sasser, 1990), increased customer satisfaction, long-term economic returns for the firm (Anderson, Fornell & Lehmann, 1994) and increased repurchase intentions (Soteriou and Chase, 2000). Employees, by providing prompt and reliable services to customers and by understanding customers' specific needs, can better anticipate and serve customer needs through appropriate product/service delivery. Employees, by insisting on error-free records and providing dependable services, will ensure

both the continuity of successful business operations and profitability.

Narasimhaiah et al. (2010) stated that by having knowledgeable IS employees who maintain good communication through courteous interactions with business units (assurance), have users' best interests at heart and are able to understand users' needs better (empathy), IS services will become better aligned with organizational goals, resulting in improved quality of decision making and improved profitability (internal organizational efficiency), better anticipation of customer demands and more accurate sales forecasting (market information support). They furthermore stated that prompt provision of services to end users by the IT unit (responsiveness) will enable rapid responses to new business opportunities (through market information support).

4.2 Management Information System (MIS)

MIS refers to a system that uses information in order to ensure apt management of businesses. Fundamentally, all the facets of MIS run concomitantly in order to ensure overall efficiency of the whole system. Waston (1987) defined MIS as "an organizational method of providing past, present and projected information related to internal operations and external intelligence. It supports the planning, control and operation functions of an organization by furnishing uniform information in the proper time frame to assist the decision makers".

Jahangir (2005) states that based on the significant role that information plays in choice of decision to be made, organizations must ensure that they have a good management information system. As a notable general observation, a good MIS ensures good decision making just in the same way bad MIS propel the making of bad decisions. UStudy.in (2010) supports the above observation by saying that "The quality of managerial decision-making depends directly on the quality of available information" and the managers should therefore cultivate an environment that encourages the growth and viable sprouting of quality information.

As a key consideration, MIS is a highly complex and delicate arena that calls for a lot of caution to be taken by its managers. It is for this reason that it is recommendable for organizations to ensure that they carefully select the individuals who are placed to control the systems. The characteristic of the person who handles the system is very much important for the efficient functioning of MIS. The more cautious and professional a person is, the better the person gets an assurance of positive prospects of MIS with regards to decision making and other related areas of business (Lingham, 2006).

Allen, Heurtebise and Turnbull (2010) explored that Most MIS programs are endowed with the capacity to give real-time updates of the occurrences in company or system. By real-time, scholars simply refer to immediate updates of occurrences in a system. These immediate updates help managers and employees to take necessary actions as soon as is deemed appropriate—especially during the discovery and management of crises. This augments progress and improvement in company operations through timely decision making. This is important for companies in the modern-day generation where any slight lapse in decision making can lead to very huge losses.

Srinivas and Nowduri (2011) stated that, a good number of MIS used today can perform multiple tasks all at the same time. This potential to multitask increases efficiency in a company since several business operations can be conducted simultaneously. With special regards to decision making, the capacity to multitask ensures that decisions are made speedily when compared to those systems which can only handle one task at a time.

A good number of MIS play the role of record keeping or institutionalization of data bases that can easily keep confidential or invaluable information. In essence, decision making often calls for the reading of certain past work (Jahangir, 2005). This is where record-keeping comes in handy. On the flipside, databases normally function towards providing future places of information retrieval. Principally, the record keeping and data-basing tool of MIS definitely ensures that decisions are made viably while businesses run smoothly.

Rhodes (2010) stated that Management information systems give managers quick access to information. This can include interaction with other decision support systems, information inquiries, cross referencing of external information and potential data mining techniques. These systems can also compare strategic goals with practical decisions, giving managers a sense of how their decisions fit organizational strategy.

4.2.1 MIS in Banks

The world as a whole has become one global village as a result of information technology and in a bid to adapt to the constant changes with the improvements in science and technology, the banking industry has seen the need to also change their mode of operation in order to keep abreast with the current practice and to effectively face the constant challenges experienced in business. These changes and challenges go along with the dynamic nature of the business environment, which is the key determinant factor of the success and failure of any business. In the light of this dynamic nature of business, customers have a lot of expectations from banks in the way they render their services. The growing expectations prompt the banking industry into the use of Management Information System to smoothen their performance and the improvement of their services rendered to customers.

As banks are the most important institutions in the chain of financial system in a country, it plays vital roles in the financial sector, not only in terms of turnover, profit and employment, but also it has impact on all functional areas of the economy. Therefore, providing effective services by banks to the nation are necessitated with the growing economy due to the rapidly advancing IS. Hence, installation of latest technology in banks becomes indirectly mandated in order to be successful in business through satisfying their stakeholders. Recent development in IS Technology is a driving force to change the service quality of banks. According to Abulqasem, Muhammad and MohdFaisal (n.d.), MIS is a management system that is used by many banks in developed countries nowadays to improve the banking service and

support decision-making process. Beccalli, Elena and Frantz (2013) explains that the introduction and usage of new improved systems and technology shape the way of banking business; thus, it is expected to increase the effectiveness of operations and to reduce cost.

4.3 MIS and Service Quality

Many authors have identified that there is a relationship between MIS and service quality. First of all, Narasimhaiah et al. (2010), indicate that many authors have identified that, nowadays, increased percentage of IS budgets are being devoted to IS services and more emphasis is given to the service dimension of IS (e.g., Kettinger and Lee, 1997; Pitt, Watson and Kavan, 1995; Watson, Pitt and Kavan, 1998).

Most banks consider information technology (IT) as a route for service quality improvement, while others perceive it as a cost-effective expansion strategy (Kim and Davidson, 2004). There is a general consensus regarding the importance of understanding the patterns of IT adopted by bank customers (Pikkarainen, Pikkarainen, Karjaluoto & Pahlila, 2004), and several studies (Applegate, McFarlan and McKenney, 1999; Kim and Davidson, 2004) emphasize that financial institutions such as banks are distinguished from other businesses in their reliance on IT. As early as the 1980s, Porter and Millar (1985) found that banking was one of the most information intensive sectors. Banks tend to use IT to improve the quality of their services, increase efficiency and customer satisfaction, and offer wider choices with lower costs to the customer. In other words, banks are using IT for competitive advantage.

4.4 Employee IS Performance

The relationship between MIS and service quality was discussed in the above section (Section 4.3). However, Pratyush and Berg (2003) found out that the impact of the information system on the employee IS performance has an influence on the quality of service provided. Therefore they argued that MIS does not directly impact service quality but through employee IS performance. Further, Vannirajan and Manimaran (2009)

support this statement by emphasizing their finding that is, IS dimensions such as system quality, information quality and employee IS characteristics were influencing service quality in a positive manner but only through employee IS performance. Emery (1971) has written that information has no intrinsic value; any value comes only through the influence it may have on physical events and such influence is typically exerted through human decision makers.

Many organisations feel that their people can provide a competitive advantage, and therefore their people contribute to the organization's performance. Employees play a pivotal role in organizational success. Employee performance has been shown to have a significant positive effect on organizational performance. Nevertheless, the principal influence on the organization's performance is the quality of the workforce at all levels of the organization.

For organizations to accomplish their goals, they must continually look for better ways to organize and manage the work of employees. There is a growing recognition that the primary source of competitive advantage is derived from an organization's human resources. This was not always the case, as human resources were traditionally seen as a cost.

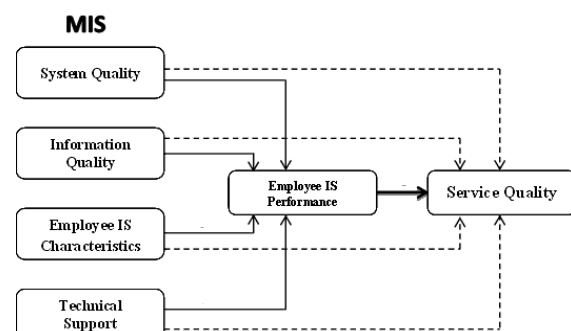
Whetten and Cameron (1998) state that individual performance is the product of ability multiplied by motivation. Kulkarni (1991) has shown that the best way to motivate employees to deliver the quality service to their customers is MIS in banks. It has been observed that improved quality is a most important output of information systems or in other words, IS has substantially improved service sector performance (Pratyush and Berg, 2003).

Srinivas and Nowduri (2011) states that MIS has been an increasingly used tool in the institutionalization and making of decisions. The important role of information systems is moving the decision making process towards the right direction and according to a chain of linked concepts that is considered as compliment elements for the system in general by increasing the efficiency and accuracy in

doing services and other activities provided by the system (Ali, Siti and Ideris, 2012).

According to Abdelhak and Dalel (n.d.), ultimately an IS exists to help an organization accomplish its objectives. An IS takes raw facts, known as data, manipulates, compiles and integrates that data into something that has meaning for a manager or operator. Information Systems provides guidance to the organizations' employees to better assist them in the accomplishment of their objectives. IS has great impact on all levels of organization (i.e. Operational, tactical, and strategic). They also impact on all functional areas: finance and accounting, manufacturing and production, sales and marketing, and human resource.

5. CONCEPTUAL FRAMEWORK



Source: Vannirajan and Manimaran (2009); Pratyush and Berg (2003)

1. conceptual framework

Based on the literature review, the conceptual framework was developed for this study. According to figure 1, MIS dimensions (system quality, information quality, employee IS characteristics, technical support) have direct impact on employee IS performance where as they have indirect impact on service quality. At the same time employee IS performance has direct impact on service quality. In this study, MIS dimensions are the independent variables, employee IS performance is the intervening variable and service quality is the dependent variable.

6. METHODS

6.1 Sampling Design

This study aimed to consider 225 sample respondents, who were the employees of

commercial banks in Batticaloa district (Manmunai North and Kattankudy divisional secretariat areas). The above said two divisional secretariat areas were selected for this study as they were identified as areas with people who engage in banking transactions frequently.

Total number of information system (IS) related employees in the selected commercial banks are 256. Stratified random sampling method was applied to select the samples of employees as the population framework was clearly identified. According to ‘Stratified random sampling’ (http://en.wikipedia.org/wiki/Stratified_sampling, seen on 28th July 2015), in statistical surveys, when sub populations within an overall population vary, it is advantageous to sample each sub population (stratum) independently. Questionnaire was dispatched to 256 employees. 245 were received, however only 238 ones were valid. 13 questionnaires were randomly excluded from the research based on the sample size. The questionnaire was developed by the researcher for the study purpose with the base researches by several authors (refer Table 1).

1. supporting articles – questionnaire

Variables	Study
System Quality	Vance, Elie and Straub (2008)
Information Quality	Narasimhaiah Gorla, Toni M. Somers, Betty Wong (2010)
Employee IS Characteristics	Goodhue (1986)
Technical Support	Kazi Omar Siddiqi (2011)
Employee IS Performance	Pratyush and Berg (2003)

The most widely used models in measuring service quality in the banking sector are the SERVQUAL and SERVPERF models (Mesay, 2012). The SERVPERF scale is found to be superior not only as the efficient scale but also more efficient in reducing the number of items to be measured by 50% (Hartline and Ferrell, 1996; Babakus and Boller, 1992; Bolton and Drew, 1991). In this study, the SERVPERF scale was used to measure service quality in commercial banks in Batticaloa district. Two additional statements were added with the model in order to avoid ambiguities.

6.2 Data Analysis and Evaluation Methods

6.2.1 Univariate Analysis

Univariate analysis is appropriate for any single variable to explore individual qualities of its data. This analysis was used to identify the level of each single variable of this study. The following criteria were used to evaluate the results.

2. Decision criteria – univariate analysis

Decision Criteria	Decision Attribute
$1.0 \leq X_i \leq 2.5$	Low Level
$2.5 < X_i \leq 3.5$	Moderate Level
$3.5 < X_i \leq 5.0$	High Level

Where X_i = mean value of an dimension/ variable

Source: Dinesh and Ragel (2016)

6.2.2 Bivariate Analysis

Bivariate analysis is used to test the association between and among study variables, in this case, the association between each of the MIS dimensions, employee performance and service quality. The below table gives the decision criteria for bivariate analysis (no correlation between two variables are implied if the range of r is between -0.1 and 0.1).

3. decision criteria – bivariate analysis

Range	Decision attributes
$r=0.5$ to 1.0	Strong positive relationship
$r=0.3$ to 0.49	Moderate positive relationship
$r=0.1$ to 0.29	Weak positive relationship
$r=-0.1$ to -0.29	Weak negative relationship
$r=-0.3$ to -0.49	Moderate negative relationship
$r=-0.5$ to -1.0	Strong negative relationship

6.2.3 Multiple Regression Analysis

To examine the relative influence of individual MIS dimensions with respect to employees IS performance and service quality, and to figure out which are important determinants of service quality, the multiple regression models were used. The fitted regression models were:

Model – I

$$Y = f (X_1, X_2, X_3, X_4, X_5)$$

where

- Y - Service Quality
- X₁ - System Quality
- X₂ - Information Quality
- X₃ - Employee IS Characteristics
- X₄ - Technical Support
- X₅ - Employees IS performance

Model – II

$$X_5 = f (X_1, X_2, X_3, X_4)$$

7. RESULTS

7.1 Reliability Analysis

The reliability of an instrument is the degree of consistency which measures the attribute that is supposed to evaluate (Cronbach, 1951). The less variation an instrument produces in repeated measurements of an attribute, the higher its reliability. Reliability can be equated with stability, consistency or dependability of a measuring tool. Cronbach’s alpha coefficient method was used to measure the reliability of the questionnaire between each variables and the mean of the whole fields of the questionnaire. The normal range of Cronbach’s coefficient alpha value sits between 0.0 and +1.0; and a higher value reflects a prominent degree of internal consistency (Cronbach, 1951).

4. Reliability analysis

Dimension / Variable	N	Cronbach’s Alpha
System Quality	8	0.867
Information Quality	6	0.812
Employee IS Characteristics	8	0.769
Technical Support	5	0.817
Employee IS Performance	6	0.879
Service Quality	24	0.957
Tangibility	5	0.860
Reliability	5	0.876
Responsiveness	5	0.873
Assurance	4	0.847
Empathy	5	0.854
All Statements	57	0.947

Reviewing table 4 reveals that the values of Cronbach’s alpha for all the dimensions and

variables are above 0.7. Cronbach’s alpha for service quality scales equal 0.957 and the overall reliability of all statements is 0.947 which are very close to +1.00 and thus, the whole questionnaire is considered reliable.

7.2 Descriptive Analysis

To assess the level of MIS dimensions and employee IS performance from the perception of employees, the 33-item scale developed for the study purpose based on Vannirajan and Manimaran (2009), was utilized. To assess the level of service quality dimensions, the 24-item scale, developed for the study purpose based on SERVPERF instrument (Cronin Jr. and Taylor, 1992) and, Vannirajan and Manimaran (2009), was utilized. Table 5 indicates the average values of the dimensions and variables of this study.

5. summary statistics – descriptive analysis

Variable	Mean	SD
Independent Variables		
System Quality	3.88	0.584
Information Quality	3.95	0.530
Employee IS Characteristics	3.97	0.539
Technical Support	3.93	0.559
Intervening Variable		
Employee IS Performance	3.93	0.630
Dependent Variable		
Service Quality	4.09	0.545

Based on the decision rule for univariate analysis, it can be interpreted that the independent variables such as system quality, information quality, employee IS characteristics and technical support, and the intervening variable, employee IS performance are at high level in the commercial banks in Batticaloa District. Similarly, the dependent variable service quality is also at high level in the commercial banks in Batticaloa district.

7.3 Correlation Analysis

Pearson (r) correlation coefficient was computed to test the direction and strength of relationships that exist among the study variables. Table 6 below presents the correlation analysis results.

6. Correlation analysis

	SQ	IQ	E ISC	TS	E IS P
SQ	1.000				
IQ	0.604**	1.000			
E ISC	0.549**	0.672**	1.000		
TS	0.429	0.533	0.497	1.000	
E IS P	0.545	0.579	0.571	0.503	1.000
SeQ	0.514	0.435	0.447	0.341	0.710**

In this table, SQ: Service Quality, IQ: Information Quality, E IS C: Employee IS Characteristics, TS: Technical Support, E IS P: Employee IS Performance, SeQ: Service Quality.

Results show that there is a strong positive relationship between system quality and service quality ($r = .514, p < .01$), moderate positive relationship between information quality ($r = .435, p < .01$), employee IS characteristics ($r = .447, p < .01$) and technical support ($r = .341, p < .01$), and service quality. Therefore, among the MIS dimensions, system quality has highest significant positive relationship with service quality, compared with other dimensions.

Further, results show that all the MIS dimensions have strong positive relationship with employee IS performance ($r = 0.545, 0.579, 0.571$ and 0.503 for system quality, information quality, employee IS characteristics and technical support respectively, $p < 0.01$).

According to the table, there is strong positive relationship between employee IS performance and service quality ($r = .71, p < .01$). Compared with other variables which affect the service quality, employee IS performance has the highest positive relationship.

7.3.1 Inter-correlations

The variables information quality and employee IS characteristics have strong positive relationship with system quality ($r = .604$ and $.549$ respectively, $p < .01$). But there is a moderate positive relationship between technical support and system quality ($r = .429, p < .01$).

The variables employee IS characteristics and technical support have strong positive relationship with information quality ($r = .672$ and $.533$ respectively, $p < .01$). But, there is moderate positive relationship between employee IS characteristics and technical support ($r = .497, p < .01$).

7.3.2 Partial Correlation Analysis

In probability theory and statistics, partial correlation measures the degree of association between two random variables, with the effect of a set of controlling or mediating random variables removed. Partial correlation analysis was conducted to analyse whether MIS dimensions (independent variables) and service quality (dependent variable) are linearly related if the effect of employee IS performance (mediating variable) is removed from their relationship. A partial correlation is a type of Pearson correlation that can range in value from -1 to +1. The results of the partial correlation analysis are presented in table 7.

7. Partial correlation analysis

	Service Quality
System Quality	0.215**
Information Quality	0.041
Employee IS Characteristics	0.072
Technical Support	-0.025

** Correlation is significant at the 0.01 level (2-tailed)

Pearson correlation coefficients were initially computed among the variables of MIS concept, employee IS performance, and service quality. The results of the correlational analyses indicated that all the variables were positively correlated with one another at 1% significant level. The multiple correlations between MIS variables and service quality were presented in table 6.

However, according to the above table (table 7), information quality, employee IS characteristics and technical support are unrelated to service quality ($r = 0.041, 0.072$ and -0.025 respectively, $p > 0.05$) when controlling for employee IS performance. Only the system quality has the positive relationship with service quality when controlling for employee IS performance, but the strength of relationship is weak ($r = 0.215, p < 0.01$).

7.4 Regression Analysis

The impact of MIS dimensions on the service quality was measured with two models. The Model-I includes all four MIS dimensions and employee IS performance as independent variables whereas the service quality as the dependent variable. The Model-II treats the

employee IS performance as the dependent variable and the system quality, information quality, employee IS characteristics and technical support as the independent variables. The multiple regression analysis was administered to find out the impact. The results are given in Table 8.

8. Regression analysis

Independent Variables	Regression Coefficients in	
	Model I: Service Quality	Model II: Employee IS Performance
SQ	0.202**	0.225**
IQ	-0.048	0.191**
E IS C	0.032	0.223**
TS	-0.056	0.194**
E IS P	0.637**	Dependent Variable
Constant	1.573**	0.203
R ²	0.520	0.448
F-Statistics	49.482**	46.414**

** Significant at five per cent level (p<0.05)
In this table, SQ: Service Quality, IQ: Information Quality, E IS C: Employee IS Characteristics, TS: Technical Support, E IS P: Employee IS Performance.

7.4.1 Regression Model I

According to the table 8, one unit increase in system quality will cause the service quality to increase by 0.202. Likewise, one unit increase in employee IS performance will cause the service quality to increase by 0.637. The above said two influences are significant at 5% significance level. The other three variables; information quality, employee IS characteristics and technical support cause -0.048, 0.032 and -0.056 variation respectively in service quality. But their influence is not significant at 5% significance level.

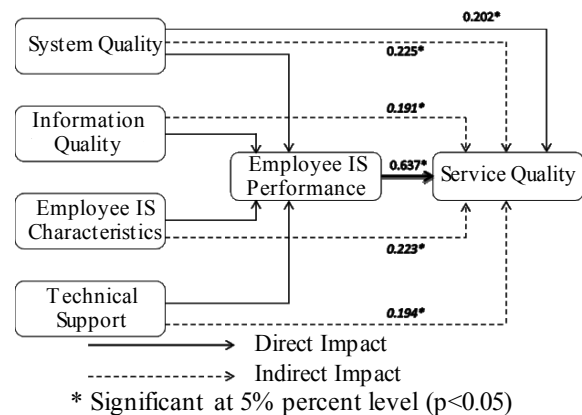
While considering the overall impact of the model on service quality, F-Statistics value 49.482 with 5% significance level reveals that the model is significant. When ‘stepwise’ method is used for the analysis, the variables information quality, employee IS characteristics and technical support was excluded from the model which means the influence of those variables is not significant. R square value 0.52 indicates that 52% variation in service quality is explained by all the significant variables (system quality and employee IS performance) included in the model.

7.4.2 Regression Model II

Employee IS performance was considered as the dependent variable in model II. Table 8 shows that the influence of all the independent variables on employee IS performance is significant at 5% significance level. Highest impact is that of system quality which causes 0.225 unit increase in employee IS performance for one unit increase in system quality. In the same manner, 0.191, 0.223 and 0.194 units of increases in employee IS performance are caused by one unit increase in information quality, employee IS characteristics and technical support respectively. All the variables were included in the stepwise multiple regression analysis. The regression model is significant at 5% significance level with the F-Statistics value of 46.414. At overall level, 44.8% variation in employee IS performance is explained by the variables in the model II.

7.5 Path Analysis

Path analysis explains the results of the regression analysis and an integrated model is presented in Figure 2. This model depicts the impact of different variables on service quality directly and indirectly through the effects on employee IS performance.



2. Path analysis

From the regression analysis (refer Table 8), it was revealed that all the MIS dimensions have significant influence on employee IS performance (around 20% variation is explained in employee IS performance by each dimension). At the same employee IS performance causes 63.7% variation in service quality. Therefore, it is clearly revealed that all

MIS dimensions have direct impact on employee IS performance and indirect impact on service quality through employee IS performance. For the purpose of showing this indirect influence of MIS dimensions in the path analysis diagram, the regression coefficients are put on the indirect lines instead of putting them on direct lines. For example, 0.225 has been put on the dot line which connects system quality and service quality. It can be interpreted from this that 22.5% of variation is explained in employee IS performance by system quality which in turn affects the service quality. The same approach was used in another research by Vannirajan and Manimaran (2009). At the same time, 20.2% of variation in service quality is explained by system quality (Direct impact).

8. DISCUSSION

8.1 Research Objective

The objective of this study was to find out the level of impact Management Information System (MIS) has on service quality (whether the MIS has direct impact on service quality or indirect impact through employee information system performance) in commercial banks in the Batticaloa district.

Multiple linear regression analysis was administered to find the results. The impact of MIS dimensions on the service quality was measured with two models. The Model-I included all four MIS dimensions and employee IS performance as independent variables whereas the service quality as the dependent variable. Table 8 revealed that the regression model on service quality was significant (Model I). The results showed that only the system quality and employee IS performance have direct impact on service quality.

To confirm this, stepwise regression analysis was performed. Information quality, employee IS characteristics and technical support were automatically removed from the analysis by the SPSS package as those variables do not have significant impact on service quality. System quality accounts for 20.2% variation in service quality directly whereas employee IS performance accounts for 63.7% variation in service quality, which is about 3 times of the

effect of system quality. Therefore, more variation in service quality is explained by employee IS performance.

The Model-II treated the employee IS performance as the dependent variable and the system quality, information quality, employee IS characteristics and technical support as the independent variables. Table 8 revealed that the regression model on employee IS performance was significant (Model II). All the independent variables explained significant variation in employee IS performance ranging from 19% to 23% of variation. System quality, information quality, employee information system characteristics and technical support cause 22.5%, 19.1%, 22.3% and 19.4% variation in employee IS performance respectively. System quality causes more variation whereas information quality causes less variation in employee IS performance.

Path analysis was performed (refer Figure 2) to summarize the results from regression analysis which will facilitate to accomplish the research objective. It can be summarized that system quality, information quality, employee IS characteristics and technical support directly influence the employee IS performance whereas system quality and employee IS performance directly influence service quality.

Therefore it can be concluded that MIS has impact on service quality through employee IS performance and especially the system quality has both direct and indirect impacts (through employee IS performance) on service quality in commercial banks in the Batticaloa district.

8.2 Relationship between Study Variables

Correlation analysis was employed to find out the relationship between study variables (refer table 6). According to the results, system quality and employee IS performance have strong positive relationship with service quality whereas information quality, employee IS characteristics and technical support have moderate positive relationship with service quality. When the partial correlation analysis was carried out by controlling the employee IS performance variable, there was no significant relationships found out between information quality, employee IS characteristics and

technical support, and service quality. Only the system quality has the positive relationship with service quality when controlling for employee IS performance, but the strength of relationship is weak. This finding goes with the findings from the regression analysis that system quality, information quality, employee IS characteristics and technical support have relationship with service quality but through employee IS performance. Only System quality and employee IS performance have direct relationship with service quality. Further, it was revealed that MIS dimensions have strong positive relationship with employee IS performance.

When the technical support is considered, it has strong positive relationship with only information quality whereas it has moderate positive relationship with system quality and employee IS characteristics. This reveals that when the technical support increases, information quality also increase, but the strength of increase is higher than other two dimensions. Because, information accuracy, information completeness, information relevance, timeliness of information, conciseness of information and content of information are as a whole represent information quality. Information is the ultimate thing that is essential for the performance of the employees, especially in decision making. Therefore, technical support is a must for keeping the information without any disruptions to it. As a result, strong positive relationship was found out between technical support and information quality.

On the contrary, under the system quality dimension, system reliability and system accuracy are the only factors which need technical support. Because of that, the relationship between technical support and system quality is moderate positive. Similarly, under the employee IS characteristics, training and compatibility are the only factors which need technical support. Due to that, the relationship between technical support and employee IS characteristics is moderate positive.

When the employee IS characteristics is considered, it has strong positive relationship with system quality and information quality. It means when the system quality or the

information quality increases, the employees IS characteristics also will become better than before (the strength of relationship is strong). Under the employee IS characteristics, most of the factors such as perceiving relative advantage of IS, reading of use of IS, self-efficacy, perceiving positive image while handling IS, compatibility between manual system and IS, and the ability to trace out problems via IS depend on the system, and the information that comes from the system. For example, if the system, and the information from the system are better enough only, the employee will perceive many advantages that he could get by information system than the manual system (relative advantage). As a result, system quality and information quality have strong positive relationship with employee IS characteristics.

Finally, it was revealed that system quality has strong positive relationship with information quality. A perfect system with imperfect information or perfect information with imperfect system is of no use to the banks. Therefore, both these factors should be considered equally important. As a result these two dimensions have strong positive relationship between them.

9. CONCLUSIONS

The research problem of this study was whether management information system has direct impact or indirect impact on service quality. This problem has been addressed through the findings. It was implied that MIS has positive impact on service quality but it happens through the employees' information system performance (employee IS performance). Further, it was revealed that system quality has positive impact directly on service quality. However more direct variation in service quality is explained by employee IS performance than system quality.

Among the MIS dimensions (system quality, information quality, employee information system characteristics and technical support), system quality has highest positive relationship with service quality, compared with other dimensions. Further, all the MIS dimensions have strong positive relationship with employee IS performance whereas it has

strong positive relationship with service quality.

10. RECOMMENDATIONS

From the findings of this study, it was found out that only the system quality and employee IS performance have direct impact on service quality. Therefore, the banks should give importance to these two dimensions than others.

Although the MIS dimensions explain direct and indirect variations in service quality, employee IS performance causes more variation than all other dimensions. Further, partial correlation analysis proved that the impact of MIS dimensions are applied on service quality through employee IS performance. Therefore, this dimension has to be improved first. Decision confidence and decision effectiveness of employees, quality of decisions made by employees, and viability of decisions of employees need to be focused. The senior management of banks needs to conduct training programs and educational activities to enable the employees to make effective decisions with sufficient confidence. Employees should feel that utilization of information system enables them to make decisions with confidence. They should be given proper training to execute decisions as intended, to put right amount of efforts to execute a decision and to execute decisions with speed and quality. Further, they should be trained to take viable decisions using MIS of the banks.

If the above mentioned aspects are implemented by the senior management of the banks, the service quality of the banks will also improve as there is a strong positive relationship between employees IS performance and service quality of the commercial banks. However, system quality, information quality, employee IS characteristics and technical support have positive relationship with employee IS performance. Further, these variables explain significant variation in employee IS performance. Therefore, if the senior management wants to improve the employee IS performance, it can put efforts to improve system quality, information quality, employee

IS characteristics and technical support of its bank.

10.1 System Quality

The dimension for which more importance has to be given after employee IS performance is system quality. Senior management and IS division of the banks have to give attention to reliability, accuracy and adoptability of the system and the minimum user requirement to operate the information system of the bank. Information Systems should be redesigned by the IS division to reduce the System failures. Further the information system should be designed in a manner that it should not cause any mistakes, thus it should be always accurate. In addition to that, system should be as simple as possible which will enable an employee with low level of IS education to operate the system without any difficulties. It will automatically enable an employee of any age and IS background to adopt the system without any hardships. If the system quality improves, the IS performance of the employees also will increase as a result.

10.2 Information Quality

The aspects such as information relevance and content of information have to be concentrated under information quality of the commercial banks. The information that comes from the system should be relevant for decision making. Unnecessary information output that may disrupt the performance of the employees should be removed out of the systems. When the employee needs some information to make a decision about a customer's request, if the system does not have that required information, the employee will be frustrated. Therefore, the information systems should have sufficient content to enable the decision making without ambiguity.

10.3 Employee IS Characteristics

The IS performance is based not only on the system, information and technical quality but also the employee's IS characteristics. Unless the employees are having a favourable attitude towards the IS at their bank, the enrichment of other three variables are not producing a desirable impact. It should be easy for employees to trace a problem from the point of

its origin by using the information system. Employees should perceive and feel that they know the process or actions behind each layer of the total organization. Then only they can have a positive attitude towards information system of the bank. Further, proper and sufficient training should be given to employees to handle the IS of the banks. Experienced personnel in information system are very much needed for the better IS performance of the bank. Therefore, banks should not allow an experienced staff to leave the organization at any cost. If an experienced employee left the bank, it will take a number of years to train and produce a same kind of employee in order to receive the same level of IS performance of the employee left.

10.4 Technical Support

Technical support is an essential element in organizations where extensive use of information system is exhibited. Especially, for banks, it is an unavoidable need. On time service delivery is expected by customers of the banks. If the system breaks down or if an employee is unable to derive required information from the system, technical support should be available anytime to solve the issue at once. If not, the customer will go for another bank.

Further, when an employee requires assistance from technical support staff, he should give individual attention on the employee's needs. Then only the employee will be satisfied and will feel free to clarify if any further issues arise in the system. There is a trend that most of the female staffs of the bank are not willing to call technical support for assistance if they find any issues in the system. They get the help from a male worker for solving that issue. Even if they find any drawbacks in the system they do not let the technical support staff know about the drawbacks. Therefore, attempts to be made in the banks that will encourage the female staff to approach the technical support staff for solving the issues in the system.

11 RESEARCH IMPLICATIONS

The present study analysed the impact of MIS on service quality in banking industry. It may be extended to various other service industries which rely on MIS extensively. This study can

be extended by including the other variables which determine the service quality that can facilitate to enhance the findings of this study. This study considered four dimensions for Management Information System (MIS). If any study considers more dimensions for Management Information System (MIS), the findings will be more worthwhile. Further studies can be in other regions in Sri Lanka in the same context and this can further validate the findings of this study. The results of this study can be further enhanced, while considering a large sample size like 500 or above. In these studies, both the qualitative and quantitative data should be used to enhance this frame work. The model in this study included MIS dimensions, employee IS performance and service quality. This model can be extended further by including more dependent variables such as customer satisfaction, customer loyalty and performance of the banks.

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