

The Impact of Database Management System on Service Delay

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ABSTRACT

The research study investigated the impact of Database Management System (DBMS) on service delay. Service delay is one of the main issues in the public sector currently. This research study was done to identify and understand the root causes for service delay and to provide most effective solutions after comparing two different situations in conducting similar operation. That is, before and after the implementation of DBMS.

This paper is based on the hypothesis that the relative weights that customers assign to key service elements in reaching an overall assessment of customer satisfaction are affected by customer attributions of factors on service delay. Descriptive data are displayed graphically on perceptions of customers collected from questionnaires distributed. Also the perceptions of service providers before and after DBMS collected from interviews were analyzed. And the satisfaction level of customers is compared using charts before and after DBMS.

The findings of the research highlight the importance of DBMS than the existing Manual File System in preventing or reducing the service delay of service providers. And also the importance of customer attributions on service delay.

KEYWORDS: Customer Satisfaction, Database Management System, Manual File System, Service Delay

INTRODUCTION

This paper extends research on impact of DBMS on service delay and identifies the major differences in two situations for similar operations. Research shows that the factors affecting service delay and the effects of factors on the level of customer satisfaction in respect of both situations. This research identifies the most efficient way to reduce the service delay. Therefore all factors affecting service delay are considered in both cases.

The service organization already exist Manual File System to store and manage data. As such, the customers' time is wasted due to the delay of service providers resulting in a negative impression.

Currently, the success of an organization is depended on its ability to acquire accurate and timely data about its operations, to manage this data effectively, and to use it to analyze and guide its activities. A DBMS is a set of software programs that controls the organization, storage, management, and retrieval of data in a database. DBMSs are categorized according to their data structures or types

The DBMS accepts requests for data from an application program and instructs the operating system to transfer the appropriate data. When a DBMS is used, information systems can be changed much more easily as the organization's information requirements change. New categories of data can be added to the database without disruption to the existing system. Therefore, the primary objective of this research was to identify root causes for the service delay and investigate the impact of Database Management System (DBMS) on it. The secondary objective is to improve the

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satisfaction level of customers by applying effective and efficient ways determined.

LITERATURE REVIEW

Service is provided by service providers to customers. When service providers provide good service, customer's satisfaction level also increases. Else the customers develop a negative impression about service providers. Service is provided according to key service elements. The term "service concept" is described as the bundle of elements packaged for sale to the customer (Sasser et al., 1978). Key service elements include core attributes that define the basic service provided; peripheral physical attributes, those features and amenities that are bundled with the core service attributes; and interactional attributes that define how employees interact with customers in service delivery (Booms and Bitner, 1981). Overall customer satisfaction is a function of satisfaction with service attributes (Oliver, 1997). The importance of each attribute is defined by the degree to which changes in attribute performance are accompanied by changes in overall satisfaction (Anderson & Mittal, 2000). A unique operational role for employees is to create customer satisfaction in service industries (Loveman, 1998, Cook et al., 2002).

Researches show that employee performance in the service encounter affects the level of customer satisfaction. These facts are more common to many of industries Westbrook (1981) in retail settings; Loveman (1998) in banking; Bitner et al. (1990) in the hotel, restaurant, and airline industries; and Goldstein (2003) in hospitals have provided evidences for this concept based on their research finding. Inability to provide service expected by customers will create dissatisfaction among customers and will effect to change their behaviors towards the service provider. Most of the time, it will bring down customer's re purchase intention. (Bejou &

Palmer, 1998, Tsiros et al., 2004). Employees' ability to diagnose and respond dynamically to problems is an opportunity for real-time service recovery. Bitner et al. (1990) find that a positive and appropriate response from an employee can overcome the negative effects of a service failure. Dewitt and Brady (2003) review conflicting theories and evidence on the impact of customer-employee rapport on a customer's response to failure and conclude that most studies find a positive relation.

Currently, most of the organizations use Information Systems for their day to day operations. Through this, organizations target to provide services efficiently and effectively. Some of the researches have also reviewed various other Information Systems. Wilson and Smith (2000) suggest that, "the creative use of microcomputer technology is one of the most promising means of improving the quality, timeliness, clarity, presentation, and use of relevant information for primary health care" (Wilson, 2000).

Many bottlenecks in the development and implementation of effective IS have been identified by many researchers in different developing country contexts. And it includes the centralized and fragmented character of services, lack of coordination, poor quality and use of information, and the complex organizational context (Avgerou and Walsham, 2000). Poor focus on the development of local expertise on the part of donor initiated projects and the tendencies of neglecting of social and organizational issues are cited as factors contributing to the problem of ineffective implementation of IS in developing countries (Lippeveld et al., 2000; Litlejohns et al., 2000).

RESEARCH METHODOLOGY

This research is conducted based on 'Applied Research' model. The first step is to identify the research problem. After identifying the issues or problems, next step

is to alter & determine appropriate topic for the research. The most important step is the literature search. It indicates the empirical studies carried out on the subject already.

As the next step, data collection was done from customers and service providers. The data collecting techniques such as individual observation through questionnaires and interviews were utilized to collect primary data. Mainly, an questionnaire was used to collect data from customers and interviews were conducted for service providers.

The data analysis was done by using statistical analysis techniques and consists of comparison study of before and after states. Therefore the research design was a pre and post evaluation and the statistical tools were used to illustrate the influence of the certain root causes for the main problem which was the basis for conducting this research.

After identifying the root causes, the alternatives were discovered. Evaluation was carried out to identify the best solution. Service providers were categorized into five majors and the times consumed by them in providing the services were analyzed. Also the satisfaction levels of customers were examined by using charts in respective situations. Data collected on customer's perceptions is analyzed based on Descriptive and Advanced Analysis. Based on the results, conclusions and recommendations were made finally.

DATA PRESENTATION & ANALYSIS

In this study data collection was carried out for two months time period. By getting the time consumed to provide services and satisfaction level of customers before and after the implementation of DBMS, The best solution selected was the implemented DBMS to minimize the delay of providing service than the existing Manual File System. It was identified by analyzing data in descriptively and advanced analysis using comparisons between two situations. Cost benefit analysis is also

showed the DBMS is the best solution than manual file system.

Descriptive Analysis

Table 1 shows how customers responded in each situation. Most of the customers reposed positively to the situation after the implementation of DBMS than before.

Satisfaction Level	No.of customers	
	Prior	After
Dissatisfied	01	00
At least satisfied	12	05
Moderate satisfied	35	24
More satisfied	04	20
Most satisfied	00	01

Table 1: No. of customers according to satisfaction level

Table: 2 shows the different times consumed by each service provider. The highest were the program assistants while the lowest were the assistant secretaries. In comparison, each service provider has consumed more time in delivering their services before the implementation of DBMS.

Service providers	Time consumed (minutes)	
	Prior	After
Receptionist	281	087
Program Assistants	437	172
Management Assistants	277	107
Assistant Secretary	079	022

Table 2: Time consumed respect on service providers

In figure: 1, two lines are indicated for all customers involved in the research in both before and after situations respectively. Considering the line variations of time consumed according to the customer's index, line of total time consumed before is more varied than the after. It means there are more gaps between two lines in both situations. More time is consumed in before than after.

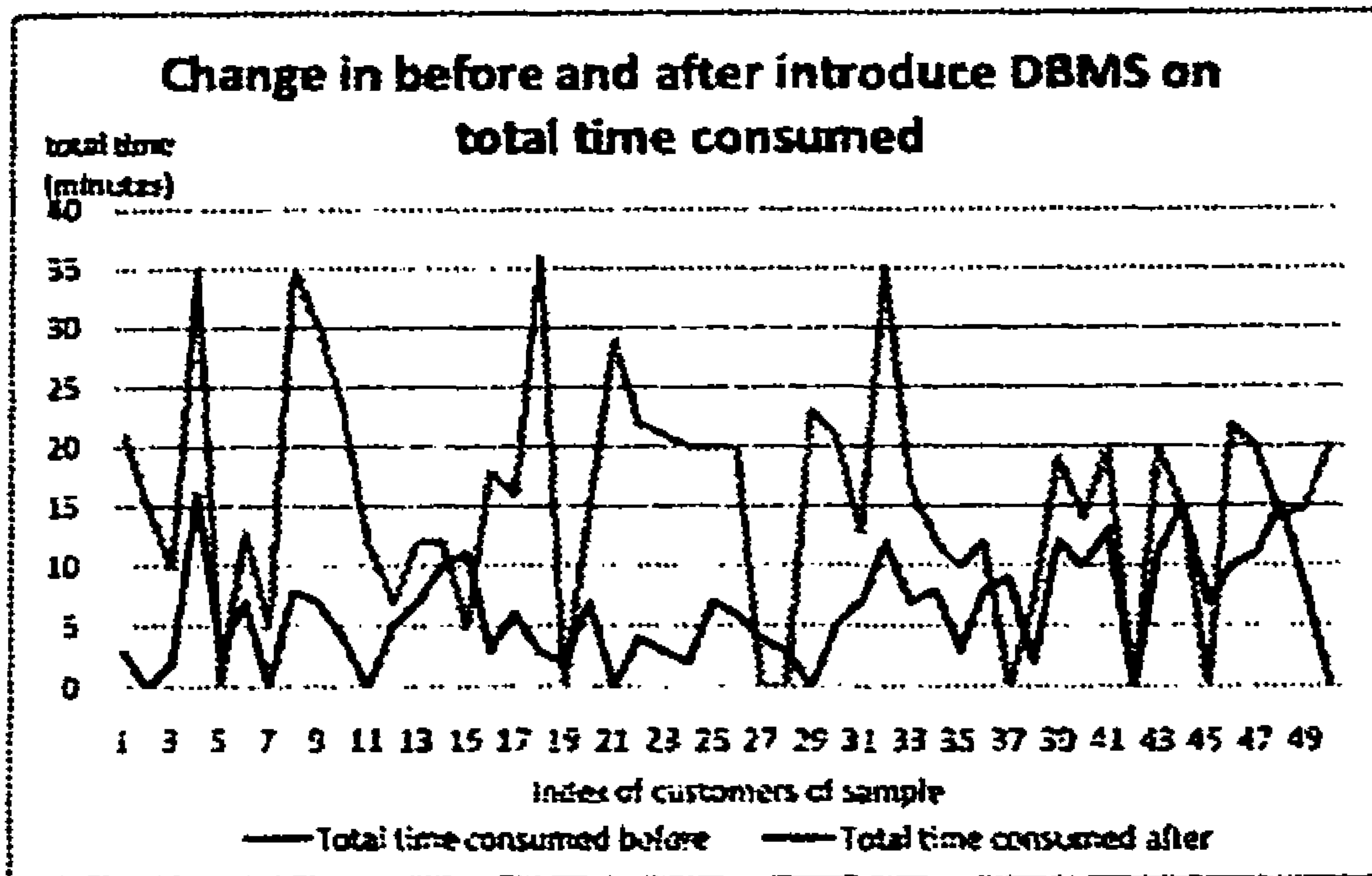


Figure1: Total time consumed by all service providers

Advanced Analysis

In comparing both situations, paired t-test is used for total time taken to provide services respect on the situations. Hypothesis is described as follows;

$$H_0: T_{early} \geq T_{after} \quad \text{versus} \quad H_1: T_{early} < T_{after}$$

Where,

- T_{early} - time taken to provide service of customers, before (Manual filing system)
- T_{after} - time taken to provide service of customers, after (DBMS)

Time consumed by	T-value	p-value
Reception (before-after)	7.537	0.000
Program Assistants (before-after)	7.139	0.000
Management Assistants (before-after)	5.150	0.000
Assistant Secretary (before-after)	1.971	0.054

At 5% significant level,
Tabulated T-value = $T_{0.05, 49} = 1.662$

Table 3: Paired sample t-test for mean on total time consumed respect on service providers

All pairs respect to service providers is rejected at 5% significant level. It means more time is taken to provide the service with the use of manual file system than the DBMS which was implemented.

Cost Benefit Analysis

Cost-benefit analysis is used mainly to assess the monetary value of very large private and public sector projects. It is typically used by governments to evaluate the desirability of a given intervention. It is an analysis of the cost effectiveness of different alternatives in order to see whether the benefits outweigh the costs.

Cost benefit analysis was used to analyze perceptions of service providers which were collected through the interviews. There were common costs and benefits by introducing a DBMS. Perceptions were recorded as its' difficult to measure benefits, especially for tactical and strategic decisions. But, it is still important to list potential benefits. Even if a special value can't be assigned, managers need to see the complete list.

Costs	Benefits
<u>Up-front / one time cost</u>	<u>Cost savings</u>
Software	Software maintenance
Hardware	Fewer errors
Communications	Less data maintenance
Data conversion	Less user training
Studies and designs	
Trainings	<u>Increased value</u>
	Better access to data
<u>Ongoing costs</u>	Better decisions
Personnel	Better communication
Software upgrades	More timely reports
Supplies	Faster reaction to change
Support	New products and services
Software maintenance	
Hardware maintenance	

Table 4: Cost Benefit Analysis

RESULTS AND DISCUSSION

Analysis represents comparisons between manual file system and DBMS based on time consumed for service providing. It shows the effect of DBMS on service delay. The influence of DBMS on service delay is determined by following factors. They are,

- Satisfaction level among customers on services of selected service units

during both before and after the implementation of DBMS

- Time consumed to provide service by each service provider and comparison before and after

According to the analysis, there is more dissatisfaction among customers for earlier manual system than DBMS implemented. Customer perception or the satisfaction level was greater in the event of post implementation stage than before. Those results were identified by line charts and data tabulated.

Therefore, it is imperative to find ways to improve effectiveness and efficiency in reducing the time consumption to increase the satisfaction among customers in any service organization. Time waste was one of the most serious cases for customer dissatisfaction. On the contrary, the satisfaction level of customers risen up with the reduction of time waste through the implementation of DBMS.

According to the service provider's perceptions, the following features were compared between manual file system and DBMS.

Manual File System	DBMS
Waste space	No waste space
Hard to update files	Easy to update files
Inconsistent of data	Consistent of data
Limited data sharing	No limited data sharing
Poor service	Good service

Table 5: Comparison of manual file system with DBMS

CONCLUSION

The main objective of the research is to improve the satisfaction level of customers in respect of service delay. The customers' and service providers' satisfaction can be improved, if the organization can control the time wastage. According to service provider's point of view, the satisfaction is dropping down as a result of lack of concern to minimize the waste of time. On the other hand, the time

wastage, with the support of DBMS is minimum than the manual process. And also, the satisfaction of both parties is higher with the support of DBMS than the support of manual file system.

Therefore the DBMS results in cutting down substantial time in providing services than the manual file system. Thus, the computerized file system is directly influence to improve the overall productivity of an organization in long run.

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