

**THE IMPACT OF TECHNOLOGY APPLICATION IN THE IMPROVEMENT
OF SERVICE DELIVERY:
A CASE STUDY AT THE ROAD TRANSPORT DEPARTMENT MALAYSIA
LAW ENFORCEMENT DIVISION OF PULAU PINANG**

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ABSTRACT

This study is an attempt to learn the impact of ICT in service delivery with the special focus on Road Transport Department (JPJ) Malaysia. It deals with the service sector that implements ICT infrastructure to enhance the services being produced by the application of technology. This study aims to understand effectiveness of e-services in terms of improvement in service delivery. The effectiveness of services delivered is recognized through the time factor by delivering time effective services. This study also tries to understand the level of technology absorption of the organization, and do technology application influence the effectiveness of service provided. The technology application means the ICT infrastructure implementation by the department. In other words, the improvement in service delivery is analysed through effectiveness of services to identify the influences of the factors on service delivery improvement.

A qualitative method was being used as the research data collection method that has a combination of content analysis, using historical data and survey through in-depth interview. The findings of this study show that the effectiveness of e-services is influenced by time factor. The findings also show that the contributing factor of ICT infrastructure, infrastructure maintenance influences the effectiveness of the services. Meanwhile, the customer satisfaction ensures the effectiveness of services provided. Therefore, the results show that the contributing factors have significant relationship with service delivery improvement.

ABSTRAK

Kajian ini adalah suatu percubaan untuk mengkaji kesan ICT dalam penyampaian perkhidmatan dengan tumpuan khas kepada Jabatan Pengangkutan Jalan (JPJ) Malaysia. Kajian ini bertumpukan kepada sektor perkhidmatan yang menggunakan infrastruktur ICT bagi meningkatkan tahap perkhidmatan yang dihasilkan oleh aplikasi teknologi. Tujuan kajian ini adalah untuk memahami keberkesanan e-perkhidmatan dari segi peningkatan dalam penyampaian perkhidmatan. Keberkesanan perkhidmatan yang disampaikan dikenal pasti melalui faktor masa dengan menyediakan perkhidmatan yang efektif dengan penjimatan masa. Kajian ini juga cuba untuk memahami tahap penyerapan teknologi organisasi, dan adakah aplikasi teknologi mempengaruhi keberkesanan perkhidmatan yang disediakan. Aplikasi teknologi bermaksud infrastruktur ICT yang diaplikasikan dalam jabatan tersebut. Dalam erti kata lain, peningkatan dalam penyampaian perkhidmatan dikaji melalui keberkesanan perkhidmatan, bagi mengenal pasti pengaruh faktor-faktor penambahbaikan dalam penyampaian perkhidmatan.

Kaedah kualitatif telah digunakan sebagai kaedah pengumpulan data kajian yang mempunyai gabungan bersama melalui analisis kandungan, dengan menggunakan data sejarah organisasi dan melalui temubual. Hasil kajian ini menunjukkan bahawa keberkesanan e-perkhidmatan adalah dipengaruhi oleh faktor masa. Dapatan kajian juga menunjukkan bahawa faktor penyumbang seperti infrastruktur ICT, penyelenggaraan infrastruktur mempengaruhi keberkesanan perkhidmatan. Sementara itu, kepuasan pelanggan memastikan keberkesanan perkhidmatan yang disediakan. Oleh itu, sebagai keputusan kajian menunjukkan bahawa faktor penyumbang mempunyai hubungan yang signifikan dengan peningkatan penyampaian perkhidmatan.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Technology has always been known as the most important factor in every successful business or services. The world nowadays is developing at a phenomenal speed by the very existing of the technology. The worlds operating based on technology and its advancements thus enhancing the economic for countries, businesses, industries and services. Therefore, the technology need to be managed well so that the economy of every business can be successful and improve the level of stability for every technology managed. Technology can bring many valuable achievements such as wealth, stacks of information and also preserves the energy or time. According to Khalil (2000), technology needs to be properly exploited so that the business can be competitive and it is no longer much of a choice because it is the need of survival in the marketplace.

Technology application in the businesses or any industries has a very big impact which is a key success in the competitive global company. There are many factors associated with improvements in technology competitiveness such as creativity, innovation, quality of products and services and also managing skills. The applications of technology not just develop the businesses but also create the ability to achieve the business missions and also their objectives. Therefore an organization need to be very persuasive in managing the technology as it has big impact on the performance of the company. Thus technology can be assets to a business or service firms as the technology enhances the services or performance of the company. The advances of technology have been widely used by services firm that have been making great strides in getting work done with fewer employees.

The word technology refers to all knowledge, processes, methods, tools, products and systems employed in the creation of goods or in providing services (Khalil, 2000). In spite of the fact that technology used to accomplish objectives it also means the way of doing things. Throughout the world, technology is being installed in many ways such as the use of machines in industries, Microsoft based software's, the firewall's or security and also the information technology such as systems in the organization. Information technology refers to the technology application of computer, internet, software and telecommunication equipment. While in business context, information technology has been defined as the study, development, application, implementation, support or management of computer-based information systems by the Information Technology Association of America. The information technology also is the subsystem of an information system. Therefore, information technology has become a major influence for business activities nowadays.

Information technology can be classified as computer hardware technologies, computer software technologies, telecommunications network technologies and data resource management technologies. Despite that, the information system refers to a set of interrelated components that retrieve, process, store, and distribute information throughout the entire organization to support decision making and control the organization. Furthermore, technology application has been an important driver to many service organizations as their main objective is to reduce the cost of providing services by using employees and improving the service delivery rate by using the technology application such as system.

Therefore, there are many types of technology that can be implemented by an organization into their system. First of all, the technology must be understood well before it is being used because the technology used must be in a form where it has a good match with the required resources for the optimal output. This means that every organization must have an appropriate technology being installed in their system so that the technology can provide an effective use and save cost at the same time. Moreover, Khalil (2000) states that, the appropriate level of technology applied in an organization may result in better utilization of labor resources and improved production.

Thus, every technology being utilized in every organization or industries needs to be managed well in order to achieve the optimum output. The management of

technology indicates that technology is the vital factor in creation of wealth for each organization. This means that it creates many important benefits for an organization such as the effective use of resources, increase level of knowledge, increase the profits, enhance the productivity and also in the meantime can preserve the environment.

1.2 PROBLEM BACKGROUND

Many think that the application of technology in service delivery is an effective factor but the idea of implementing technology in the service sector is a very successful factor rather than only an effective factor. This is because technology has been proven that it is an important driver to a successful business and country. Therefore, the application of technology is a big investment on service delivery and business value as the technology business value and service delivery enhances the productivity, increases profitability, improve the work relations, competitive advantage and efficient use of resources for both at intermediate level and also organizational level (Prasad et al.,2008, Melville, 2004,Devaraj and Kohli,2003).

Service delivery has been chosen in this particular study because services have become a vital factor to a business nowadays, because services work as the main output for a particular business. Information Technology (IT) been applied into the service systems to facilitate a better understanding way to a user needs. Therefore information technology can facilitate the services through a special designed system model. In this way, the business can operate better and efficiently with another way of providing the services to a customer. There are many types of industries that work beyond this type of service supply in Malaysia such as in the education sector the universities nowadays are operating with e-Commerce while the government sector also uses e-Government and for business it is e-Business. There are some business such as DHL Express and POSLAJU National Courier that works in Malaysia in the same business area that is service delivery. Therefore, with the achievements of these businesses it is proven that information technology is a critical factor to a successful businesses, industries or organizations.

In this study, the Road Transport Department Malaysia has been chosen because there are many significant services being provided by the department that is vital to the citizen of Malaysia and also to outsiders. Nowadays they have implemented the very

new concept of accommodating the services to the customers such as introducing the online transactions to perform any core services that is provided by the department. Thus, the department has taken a very big initiative in transforming their services into online transactions by employing the information technology into their system.

1.3 PROBLEM STATEMENT

Information Technology (IT) has become the vital factor to businesses, industries, organizations, from local to international level of any country. The enhancement of information technology leads a great effect on the higher value of information within the company and creates new chances for business (Laudon, 2005, Bentley and Whitten, 2007). Laudon (2005) has stated that organizations need the application of information system and an increased strength in communication system to be successful and profitable companies in the global market.

In order to maintain business process and provide all the information needs for every department within the organization information systems need to be developed. Thus, the information system needs to be accepted and connected to all of the employees within an organization. The information system also need to be understood by all the employees so that the service provided satisfy the customers and fulfill all the customers need. In contrast, this means that the system need to be implemented throughout the entire organization successfully by having the employees completely prepared, trained to operate and use the system efficiently.

The main challenge an organization is facing in this 21st century is ensuring the services being delivered to the customers meet their requirements and also fulfill their expectations. The increasing uses of information technology in services firm also have led them to continuously improve the efficiency of their technology services and also in innovating better operating system. Therefore an organization need to specify the goals in employing the information technology whether to reduce the cost, decrease the total time of such a service being provided or completed for a customer, or by improving the quality of services that is produced to the customers.

Firms encompasses that the services produced by Information Technology (IT) are strategic assets that is to uphold the information and services management. However, the organization does not recognize the importance of the processes as it is the main core for the implementation of the information technology to be successful.

According to Nenickova (2011), Information Technology Infrastructure Library (ITIL) have found that one of the vital factors to ensure triumph is having convenient processes by maintenance and follow up not only for the accomplishment of the information technology.

1.4 RESEARCH OBJECTIVE

The objectives of this research are:

1. To investigate the level of technology absorption by the road transport department.
2. To analyze the effectiveness of e-services that is provided by the road transport department.
3. To find out the relation between the technology application and the efficiency of the services provided by the road transport department.

1.5 RESEARCH QUESTION

The research questions of this study are:

1. What is the level of technology absorption of road transport department?
2. What is the factor to effectiveness of e-services provided by the road transport department?
3. What is the relation between the technology application and the efficiency of the services provided by the road transport department?

1.5.1 THEORETICAL FRAMEWORK

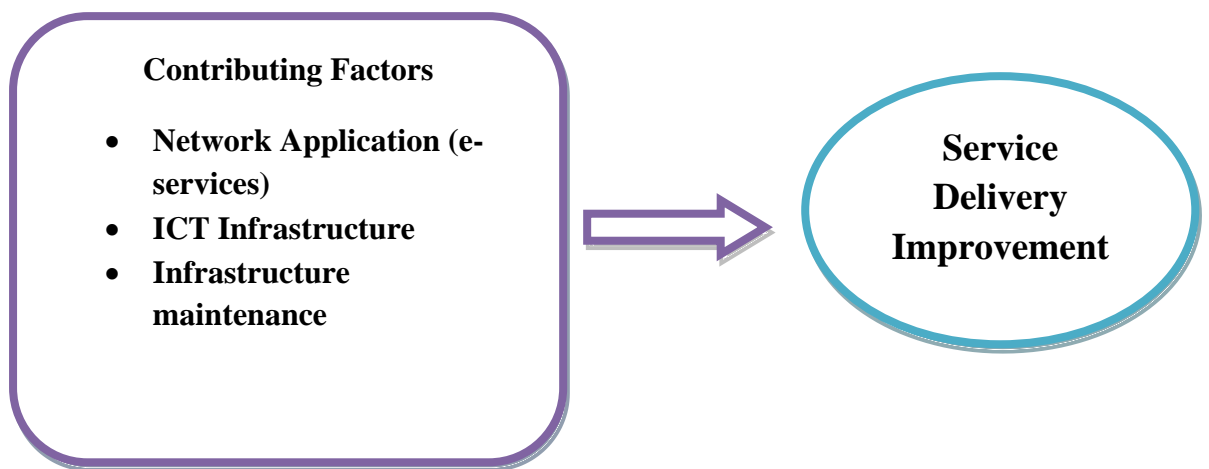


Figure 1.1: Contributing factors to service delivery improvement.

1. The network application influences the service delivery improvement.
2. The ICT infrastructure influences the service delivery improvement.
3. The Infrastructure maintenance influences the service delivery improvement.

1.6 RESEARCH SCOPE

The study will be conducted to focus on the issue of impacts of technology application in the improvement of service delivery. The study will be administered at the Law enforcement Division of Road Transport Department Seberang Perai, Pulau Pinang, Malaysia. The study will be carried out at the JPJ complex of Bandar Seberang Jaya, Seberang Perai. The duration of the study will take about 3 months starting from June to August 2013. The respondents for the study will be from:

- (a) IT officer from the Information Technology Department
- (b) Higher officer from the Law Enforcement Division.
- (c) System technician of the organization

1.7 SIGNIFICANCE OF STUDY

Transformation, innovation and invention all of these have their effects whether positive or negative it is. Same thing goes to this issue that is the technology application in the improvement of service delivery. It is vital to investigate the impact of the technology application in the improvement of service delivery because through this the organization will recognize the impact whether it is good or bad in delivering their services. Organization also will realize their performance and efficiency of their service delivery system. Therefore, the information technology may bring many effects on the organization such as the organization can communicate in better way using their information systems and can improve the service delivery time that is most efficient if the technology been employed at most effective level.

Many of the service providers implement information technology in their operating system so that it can enhance their service quality, financial performance, productivity and the most vital is customer satisfaction. In contrast, IT can help enhancing the service quality by higher convenience, supply higher number of services and accumulating service performance information for the use of management (Furey, 1991). Other than that, the performing service providers always follow up to the information technology based service system since it is fundamental to remain competitive (Bonfield, 1996).

Quality programs along with information technology employed will thus deliver superior quality of customer service as the importance of the organization is to maintain the relationship with customers. The successful of every service firms are customer satisfaction and loyalty. Customer satisfaction occurs since the service provider is able to meet their expectations. Therefore, this study indicates whether through the implementation of information technology increase the customer satisfaction and meet their demands or not. In addition, the customer-oriented firms should use IT by enabling employees to cooperate with customers, understand their demands and deliver exactly the expectations that they need effectively.

Service provider performance level are measured through the customer satisfaction this is because as the services provided are the real products that needed by the customer. Furthermore, this study will determine the necessity for the application of

the technology and whether the investment in information technology is the best possible investment for the organization.

1.8 OPERATIONAL DEFINITION

1.8.1 Information Technology

Information Technology refers to the use of technological application or hardware and software such as computer, internet, operating system, communication tool, telephone and other technology equipment to retrieve, process, store and transmit information. Information technology also can be called as the technology side of an information system where it is the subsystem of an information system (Laudon and Laudon, 2011).

1.8.2 Information System

Information system can be technically defined as a set of interrelated components that collects, retrieve, store, process and distribute the information for a specific purpose to uphold decision making or manage an organization. Whereas a system indicate a group of interrelated components with a pertinent defined boundary working towards achieving common goal by adopting inputs and generating outputs in an arranged transformation process (Laudon and Laudon, 2011).

1.8.3 Service Delivery System

Service delivery system indicated as the set of technology system being assembled and organized together with the firm network design to supply services that meet the customer expectations and thus fulfill the needs of a customer. Service system can also preferred as customer service system and this term can be used to explain services firm, organization and management.

1.8.4 Technology Absorption

Technology absorption can be defined as the technology being absorbed by an organization and the technology is totally understood thus it can be further enhanced. Consequently, technology absorption demands research and development projects, enhancement of product, improvement of process and systems. Hence, the organization's ability to understand and exploit new information is the absorptive capacity of the firm (Khalil, 2000).

1.8.5 Management of Technology

Management of technology can be defined as an interdisciplinary field that consists of combined knowledge from engineering, science and business administration fields (Khalil, 2000). It also can be known as an interdisciplinary field that involves the planning, development, and application of technology capability to achieve the strategic and operational objectives of a company (National Research Council report, 1987).

1.9 EXPECTED RESULT

Service encounters existence has been very essential and are increasing crucially in all type of organizations. Most industries including service encounters have readily seen the benefits of technology application. Indeed the infusion of technology does provide many benefits to service encounters. Technology can influence the interactions between a customer and an employee, henceforth the technology also can replaces the human service providers. Apparently, the use of technology can increase the customer's experience by the effective implementation through all service providers across the globe.

Implementation of technology also can impact the whole provider's organization performance by making the employees work becomes more efficient and thus increasing the value of work. Subsequently, the service encounters also may be providing many types of services that can make the customer are the one who actually deliver the service for themselves. In these particular services the employee does not being involved as the technology provided can be used by the customer instantly. For example, such use of automated teller machines, prepaid top-up machines, and also General Ticketing Machines (GTM) for the fares of Mass Rapid Transit (MRT) in Singapore and Light Rail Transit (LRT) in Malaysia.

As a result, technology creates many innovations as the self-service technology and this certainly make more benefits of using technology when the customers able to use and obtain the services at their pleasure. Similarly, FedEx have been using the application of technology in their service sector also have customized their offerings for the customer needs and thus satisfy them by meeting their expectations. The services provided by FedEx include the RFID technology where the Radio Frequency Identification Device tag have been placed onto the box or packaging that is sent by the

customers and hence the RFID can be able to track the movement of the package sent. Basically, the customers can identify the location of their package. Through the implementation of technology also FedEx have been using a system, software, and internet that enables the consumer to track their packaging and determine the possible reach time of their package themselves. Therefore, this study will ensure the importance of the application of technology to the service industries is well realized. In fact, through the realization of the importance from the application of technology also might attract the new service providers to be able to install such technology in their organization and enhances the firm productions.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this new era of technology application in every nation, most organization has taken big steps in adapting technology in their systems of managing their organization work-flow. Now, the information technology with the invention of computers, telecommunication, system, software, and also internet has played very significant role in business operations. There are many impacts that IT investments has bring to the business operations such as Office Automation (OA) where it supports the communication between customers and business employees and also among the workers themselves. They can now communicate through the Email, Fax, and through the system accounts.

This also benefits the organization whereby through the use of computers and IT they can set-up electronic scheduling of meetings and appointments.

In fact, Sellappan (2000) has summarizes the importance of information technology and computers in business stating that:

‘Most businesses today depends on the computer and Information Technology (IT) to carry their business tasks such as banks, courier services and airlines rely heavily on computers while other firms such as restaurants are less relying on the information technology and computers.’ (p.14)

Furthermore, business partners in diverse area around the world can now discuss and make decisions regarding any business issue by using the video conference in the computer and thus does not need to travel and have meeting in the same exact location. IT also has enabled many virtual colleges and universities. This means that students

nowadays does not have to go far to attend their classes which means the students may be able to further their studies by having distance education. The distance education means that the students can have their professors be teaching them through video conference or audio recording and this can be done with the introduction of high capacity transmission media such as optical fibers.

Additionally, business firm that provide services based on entertainments such as movies also can use IT and supply the videos online which make the customer easier rather than having to go to a movie theater or video shop to get a copy for themselves and. Business and organization also can facilitate their transaction using the Electronic Data Interchange (EDI) where they send every orders using the online transaction where their orders can be placed faster and does not need any barriers for time and cost where they can also save a lot of papers by eliminating purchasing forms.

Many organizations also have been implementing the use of information technology applications such as Manufacturing Resource Planning II (MRP II) and Computer-Aided Design and Computer-Aided Manufacture (CAD/CAM) to plan, forecast, design, produce and manage inventories. Moreover, the managers in the organization can use Decision Support System and Executive Support System (DSS and ESS) for enabling higher decision making level. Similarly, every manager for each department and level of an organization such as financial, marketing, sales, purchasing, and human resource managers can use Financial, Market Intelligence, Sales Monitoring, EDI, and Human Resource Information Systems to integrate their work and tasks better and enhance the quality of their business value.

Henceforth, IT applications can benefit an organization in many ways such as through the productivity improvement, increasing customer service, enhancing sales, reducing costs, efficient use of resources, and can also help make better planning and decision-making. Therefore IT applications can be used by organization in every area that is operating in a firm to improve the business operations and quality. Information technology also can make the organization to be more competitive in the increasing global market area.

2.2 EARLY STUDIES

This study will be carried out to assess the relationship between the information technology and the efficiency of the service provided by the Road Transport Department Malaysia. Consequently, similar to the previous studies that have been examined, the impact of technology application and the rate of efficiency in service delivery of an organization is difficult to understand (Bielowski & Walczuch, 2002). Furthermore, in general the empirical studies in the 1980s and during the early 1990s, did not find any relation between the IT application in the organization and the productivity enhancements (Quinn & Baily, 1994; Becchetti et al, 2003).

Meanwhile, the studies that have been carried out before have found small benefits, besides they also found negative effect of IT investments on productivity. In fact, some of the studies also have admitted the positive effect of IT application on firm productivity. According to Weill (1992), he determined that important productivity attains from the IT transaction. Moreover, the impact of IT deployment into the organization could be most well perceived by the test conducted at the information process stage (Mukhopadhyay et al, 1997). Furthermore, as summarized by Brynjolfsson & Hitt (1996) and Stiroh (2001) states that there are impacts of IT investments due to the production.

Although there are many of previous research conducted on the impact of IT on the improvement of production, however these studies most of all only carried through the problems arises in the corporatized and private organizations. This means that there are only small amount of studies about the IT applications in the public organization. Therefore, this is also because of many research that have been conducted in public services mainly focused on the issues of e-government and why IT been introduced (Odendall, 2003).

One of the research that have been carried out to assess the impact of IT on organizational efficiency in public services also have created a new approach to supply the indications of IT investments to enhance the efficiency level in government organizations. Therefore, based on previous studies also Murakami (1997) states that, information technology investment may be able to reduce costs, increase productivity and enhance living standards.

2.3 INDUSTRY DEFINITIONS OF INFORMATION TECHNOLOGY

Information technology also is known as the use of hardware, software, operating system, services, and other technology infrastructure to control and deliver information using data, video and hardcopy such as in papers. According to Information Technology Association of America (ITAA), information technology can be defined as the design, employment, support of information system based on computers, computer software and hardware applications. Meanwhile, the information technology of service firm consist of organization in providing telecommunications, computer programming, computer systems design services, and telecommunications. Furthermore, industries also include firm that occupies information dissemination and entertainment, such as broadcasting, publishing and recording.

Therefore information technology is a tool that a manager can use to make better decision in improving the firm business process. Information technology can be divided into five categories which are the computer hardware, computer software, system, data management technology and network application technology. First of all, computer hardware can be defined as the devices or equipment used for the three basic activities of an information system that are input, processing and output. There are many type of computer hardware including the computer itself from many sizes, the input, output and storage device and also networks devices that can connect all of the computers under the use of one working connections (Laudon and Laudon, 2011).

Other than that, the computer software can be known as the program inside of a computer where it consist of the full set of instructions and command to control the computer hardware and perform certain task in an information system (Sellappan, 2000). The data management technology is the application and use of software in organizing the set of database in a system. Moreover, a system can be known as a platform of work process where the information will be collected, processed and distributed. System consists of many components that are interrelated and work together in order to achieve a set of purpose or goals.

Lastly, the telecommunications and network application can be known as the software and physical devices that links computer hardware and transmit data from one location to another (Laudon and Laudon, 2011).

2.4 SERVICES

2.4.1 Definition of Service

Service can be state as any principal or additional activities that do not produce a product as the main outcome. Fundamentally, service can be defined as the work done by a person or an organization for the benefit of the customers (Albrecht and Zemke, 2002). Service is a combination of outputs and experiences delivered by the service provider and received by customer. While service outputs are the outcomes or results of the service processes that being delivered to the customer. Service can be defined as a social act that takes place in direct contact between the company employees and the customer.

Service also can be defined as a set of abilities in performing something with each of these abilities being a set of work performed by an organization in order to produce requested functions by another consumer which is the customer. In the context of online services, the services can be defined as the set of transactions performed by the system or server that is delivered to customers in a specific time or manner. Therefore, services can be divided into various types of services such as the packaging and delivering services, facilitating services, information services, technology services, network services, and the most vital service is customer services.

Customer service is the service being delivered either directly or indirectly to the customers. The term of directly being delivered to the customer means that the employees of a business firm operate and produce the services face-to-face with the customer and this always relates to the good or bad perceptions of the customer based on the services that have been delivered to them. Hence, the people or personnel those work as the front line employees need to be very delicate on the efficiency and effectiveness of the services that they will be delivering to the customer.

While on the other hand, the term of indirect services are the services that will be distributed by the use of technology equipment such as computer or internet service. This type of service can be more efficient and timely because they are based on the network and system. Therefore, nowadays types of services are used more widely to make the customer satisfied and thus increasing their loyalty towards the firm.