

## Conference Paper

# Optimization of the Use of Transaction Processing Systems in Minimarkets

Yuhelmi, Mery Trianita, Surya Dharma, Listiana Sri Mulatsih, and Rahma Fitri

Department of Management, Bung Hatta University

## Abstract

The use of information technology in supporting the effectiveness of company operations is very important. This study aims to determine the optimization of the use of Transaction Processing Systems in minimarkets in the city of Padang. Sampling uses accidental sampling of the owner/manager and operator in the Minimarket. The analytical method used in this study is a descriptive analysis. The results showed that 85.6% of 97 minimarkets in Padang had used transaction processing systems in support of sales activities and services to consumers. The use of computer-based transaction processing systems had resulted in shopping receipts to reduce the level of error in calculating shopping values. Information about prices and changes made by updating the database and changing labels on the product manually. Limited cooperation with banks is only 49% of minimarket providing payment facilities by debit/credit card. An interesting finding from this study is that there is a gap between the use of transaction processing systems for sales and inventory. Only 8% of minimarkets obtain information on the amount of inventory through a transaction processing system. The ordering of goods, only 10% are planned through the information system. This gap will affect the minimarket financial reports. For making this report only 14.4% of the minimarkets were able to obtain this information from the system. From the overall analysis, it can be concluded that the level of utilization of information systems for operational effectiveness is still relatively low.

**Keywords:** Transaction Processing System, Sales, Inventory, Financial Report

Corresponding Author:  
Yuhelmi  
yuhelmi@bunghatta.ac.id

Received: 27 December 2019  
Accepted: 15 April 2020  
Published: 23 April 2020

Publishing services provided by  
Knowledge E

© Yuhelmi et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the 3rd IRCEB Conference Committee.

## 1. Introduction

West Sumatra community, better known as "Minang people" was famous as a settled foreigner with a strong trading soul since long ago, as their customary norm. Minang people spread in many areas in Indonesia, as well as abroad. There are those who work as officers in various agencies, but many of them are also work in the market, whether as street vendors, shop owners, printers/ photocopies, as well as the owners of restaurants Padang. In other countries, Minang people dominate the economy. In Indonesia, Minang immigrants played an important role in the trade path other than the Chinese (Muarif, 2009: 36).

## OPEN ACCESS

The Province of West Sumatra (ethnic minang place of origin) has its own uniqueness compared with other provinces in facing the free market era in economic sector. Tourists or comer who come to West Sumatra will not find any franchises minimarket such as Alfamart, Indomaret, Lawson, and 7 Eleven, eventhough those minimarket is mushrooming in the capital of other provinces in Indonesia. This is caused of West Sumatra local government concern to the presence of those giant retail, that is estimated could get rid of the traditional traders. The Mayor of Padang decision is an anticipation to prevent the enforcement of the laws of nature (the strong will win, and the losers will be marginalized).

The restriction for the franchise retail to entry Padang city is a great opportunity for the community to develop a retail business, such as minimarket or mart. This opportunity has been exploited by the responsive businessman by establishing minimarket or mart. The rapid development of retail in Padang City can be felt and seen through the grown number of minimarkets or Mart in housing complexes.

On the other hand, rapid development of technology leads the competition to become hypercompetition. Business competition is getting tighter so that clear differentiation between brands becomes increasingly faint. Almost all products provide the same value today, that makes consumers become difficult to find the uniqueness of one brand compare than other brands. Consumer behavior is currently undergoing a change. Consumers become smarter and free to choose products and consume them. To face those change, businessman must also change their business strategy so that the products or services remains the consumer's choice.

At the beginning of the 21st century, information technology earned its nickname as an enabler, from operational effectiveness, decision-making effectiveness, to gaining and maintaining a competitive advantage (Goslar & Brown, 1990; Zhang & Lado, 2001). At the lowest level, the implementation of information technology can be used for operational effectiveness. Information technology in the form of transaction processing system can be usefull to make transaction processing data can be done more quickly and accurately to obtain quality information for operational decision making (Vlahos, Ferratt, & Knoepfle, 2004; Al-tarawneh, 2015)

Information technology is currently growing rapidly, in line with the modern society development that has high mobility, requires a flexible and easy tools, and put forward the principle of efficiency. Manual methods of data processing and reporting (not using computers) are still found in most small businesses (Mahar, 2003), so the buying and selling transactions becomes longer. Moreover, monthly report generation will be difficult because of sales and purchase transaction records must be written manually

by the manager, so it takes a long time and less efficient. Thus, the issues raised in this study is to map and analyze the extent of computer-based transaction processing system implemented by Minimarket in Padang City, especially in sales transactions to help consumers obtain information, inventory management, and financial reporting.

## 2. Literature Review

### 2.1. Transaction Processing System (TPS)

Transaction Processing System (TPS) is a system that captures, inputs, stores, retrieves, and processes details of relevant business activities and produces the information and documents required to run the business (Rahmatian, 2003). In the technological development era, computers are the most important part in modern information systems, especially for transaction processing systems (Mahar 2003). TPS used in various types of organizations, both offices and various business fields, such as financial information systems at Satya Wacana Christian University (Gainau & Kurniawati, 2011).

Transaction Processing System is one part of the information system that can be done manually or using technology. One of the technologies used is a computer that consists of components: hardware, software, data, procedures, people (Mahar, 2003), user and participant (Amin, Alaudin & Azad, 2012).

### 2.2. The Role of Information Technology and Transaction Processing

Along with the rapid development of science and technology, information technology (IT) actors began to aggressively utilize these advances, to ease them in every affair. The business world is very competitive, there is a lot of competition to keep growing. Creativity, persistence, and advanced knowledge are needed to compete. Information technology plays an important role in transaction processing systems. The transaction processing system helps everyday operations become easier, faster, more accurate and facilitates real time reporting (Trigo, Belfo, & Estébanez, 2014). Transaction Processing System (TPS) is the primary key of data collection and processing in a business organization (Al-tarawneh, 2015).

The important role of IT can be divided into three; as an initiator, facilitator and enabler (Chan, 2014). As an initiator, IT acts as an agent of change; facilitator role is defined as a facility to facilitate work; while the enabler's role is to offer the ability or

help to accomplish something. Mahar (2003) says the role of IT in most businesses is to solve manual error problems such as error level, temporary or permanent loss of data, labor intensity, poor level of service, and poor response.

Integrated information systems will be used for quality management such as supplier relationship management, customer relationship management, warehousing, production process control, maintenance, and calibration (Lari, 2002). In addition, data quality is indispensable in the financial oversight process by management (O'Brien, 2015).

TPS plays an important role in the company day-to-day operations, for customers and suppliers to interact. When transactions, TPS should be able to provide satisfaction for customers, such as in price information, price changes, payment methods, and invoices. Besides, the manager can also interact with the supplier. But for small businesses, companies do not need information technology to get accurate data in business processes. For example, if a customer asks about a product they want in a store, salespeople can find it on a display rack or storage space within a few seconds and provide information about the availability of the item to the customer.

In Saudi Arabia, implementing information systems using technology helps business supervision, especially to facilitate supply chain management between supermarkets and suppliers (SM & AM, 2016). TPS can also be used as a marketing information system that acts as a decision support system in achieving competitive advantage (Goslar & Brown, 1986). Some IT benefits according to Chan (2001) are putting or reducing labor in the process, improving information analysis in decision making, coordinate tasks and processes.

### 2.3. Information System Users

TPS can be seen from two dimensions (Rahmatian, 2003), namely internal and external; logical and physical. According to an internal logical view, TPS is a flow of information within the organization, whereas in the external logic view, TPS is the information exchange between outsiders (especially customers) and organizations. According to an internal physical view, TPS is a media or technology used to support the information flow within an organization, while as physically external, TPS is a technology or media used for information exchange. Internal Information User is an Information user within the company, namely: Management, Purchasing Management, Inventory Control Management, Production Management, Personal Management, Financial Management. The information flow needed from TPS for internal users can be: sales, shipping, billing, account payable, receivable accounts, production, inventory, purchasing, receiving, and

payroll. Media to support the information flow can be a computer that supports the TPS itself.

Whereas the external information user is the information user from outside the company, among others:

- Customer; customer needs are include information about the company's products such as: the price, the shape of the goods, where and how the goods can be purchased, the type, the services provided by the company, and the alternative payment methods offered
- Supplier; if the company makes a purchase on credit, the supplier will request information on the level of confidence of realibility, the amount of credit earned, and the ability to repay.
- Shareholders; They want to assess the applicable practices and estimate future implementation. The annual reports provision to shareholders is referred to as stewardship function and is traditionally be the responsibility of the accounting information system.
- Employees; Employees have an interest in general information, such as average wage rates, benefits, corporate profits, employment rates, productivity levels, and so on.
- Lenders; Financial institutions that lend funds are particularly concerned about factors such as reputation, corporate management capability, financial obligations, and future success prospects
- Government agencies; The office of tax service is concerned with information about the company's profits, and the tax payable amount of the company to the state.

Media information used to external parties can be; face to face, mail, fax, phone, email, and so forth.

### 3. Methodology

#### 3.1. Research Location

This research was conducted on mini market or mart spread in 11 subdistricts in Padang city. The 11 subdistricts are: Koto Tengah, Padang Utara, Padang Barat, Padang Timur, Padang Selatan, Kuranji, Pauh, Bungus Teluk Kabung, Lubuk Kilangan, Lubuk Begalung, and Nanggalo.

### **3.2. Population and Sample**

The population in this study is the owner or manager of minimarket or mart in 11 districts in Padang City. Minimarkets taken are those who have or have not used a computer-based transaction processing system. The samples were selected using a non-probability method, that is accidental sampling method

### **3.3. Data Type and Data Retrieval Method**

The data type used is the primary data. The primary data is data obtained directly from the field through direct interviews with respondents in the form a structured question (questionnaire).

### **3.4. Variable Utilization of TPS**

Variables that explain the utilization level of TPS were view from two perspectives: the consumer who is the user of the sales application, and the minimarket manager who needs the output for the benefit of inventory management and financial position. From the consumer side as user, TPS utilization level is seen from receipt from TPS, price information, price change technique, and payment method offered. While in terms of inventory management, the TPS utilization level is seen from the inventory information used, how to order inventory, and inventory recording.

### **3.5. Analysis Method**

Descriptive analysis used in this research is to map the implementation of transaction processing system at Minimarket in Padang City. This analysis calculates the frequency of each utilization level of data processing system that implemented in the minimarket operational activities

## 4. The Research Result

### 4.1. Overview of Mini Market Respondents

Geographically, the population of this study is all minimarkets in 11 districts in Padang. Using accidental sampling method, this survey got 97 minimarket respondents. The minimarket distribution can be seen in Table 1 below:

TABLE 1: Minimarket Distribution by Research Area.

Sub-district	N	%	Length of Establishment (year)			
			Average	Min	Max	Stdev
Kuranji	15	15,46	4,00	0	9	2.673
Padang Utara	14	14,43	8,00	0	22	5.657
Padang Timur	11	11,34	6,18	0	22	6.882
Koto Tengah	10	10,31	7,20	0	22	6.477
Lubuk Begalung	10	10,31	4,70	1	14	3.802
Pauh	9	9,28	6,11	1	14	4.567
Lubuk Kilangan	9	9,28	4,44	1	10	3.358
Padang Selatan	7	7,22	7,43	4	14	3.690
Padang Barat	6	6,19	21,67	2	37	14.067
Nanggalo	4	4,12	4,50	0	9	3.697
Teluk Kabung	2	2,06	19,50	17	22	3.536
Total	97	100	8,52			

Reference: Data Processing

Minimarket becomes the most popular business for many businessmen in Padang City, because it has a bright prospect. The number of minimarkets tends to increase every year. Overall minimarket average length of establishment is 8.52 years. Even in some districts many new minimarket established in less than 1 year. Some minimarkets were found to be pioneers, with ages over 20. Distribution of minimarket samples by sub-district gives an illustration that the minimarkets number in each sub-district is at least influenced by three factors: population density, sub-district location and distance from the coast.

Padang Utara, Lubuk Begalung and Pauh are districts with high population density, because there are many universities. The high number of students attract entrepreneurs to establish minimarket. In addition, the minimarket is also easily found in the sub-district that became the main entrance of the Padang city, such as: Koto Tengah and Lubuk Kilangan. Padang City is a unique city, because it is the only provincial capital that

does not have a bus terminal. This makes the city gate area always filled by the AKDP bus. The large number of passengers who will travel attract entrepreneurs to establish minimarket in the area.

Minimarket quantity in Kuranji sub-district is relatively more than other districts. Population density increased significantly since the massive earthquake in 2009. Tsunami issue caused many Padang city residents moved away from the coastal areas to this district. Meanwhile, not many minimarkets were found in coastal areas. There are only two minimarkets (2.06%) found in coastal areas, Teluk Kabung sub-district, which deserve to be respondents. Although this district has such great tourism potential, minimarket still not grow here.

Establishing a minimarket has a high for business people, because this business has an interesting daily turnover. Overall, 60.82% of minimarkets have daily turnover between 3 to 9 million rupiah, and 21.65% has a daily turnover of over than 9 million rupiah. In accordance to the minimarket definition and criteria, it is not surprising that 85.54% minimarket is a private company. Distribution of Legal Entity Status based on daily turnover can be seen in Table 2 below:

TABLE 2: Distribution of Minimarket Legal Entity Status based on Daily Turnover.

Legal entity	Daily Turnover				Total	%
	< 3 million	3– 6 million	6 - 9 million	> 9 million		
Individual Company	13	28	23	17	81	85,4
CV	2	2	4	2	10	10,3
Private Limited (Pte Ltd)	2	0	2	2	6	6,3
Total	17	30	29	21	97	100

Reference: Data Processing

## 4.2. Research Results and Discussion

The survey results are grouped into two user perspectives: consumers who are users of sales applications, and minimarket managers who need output for inventory management and financial position purpose.

### 4.2.1. Description of TPS Utilization for Consumer

At the lowest level, information systems can provide benefits of operational effectiveness. Routine activities can be done easily and completed quickly without much effort.



In addition to operational effectiveness (inventory), information systems can also be used to improve service to consumers. Table 3 shows the minimarket attempt to meet customer service needs based on their information system.

TABLE 3: Descriptive of TPS Utilization for Consumer Service.

Application System Output	Total	%
<b>Shopping Receipts</b>		
No receipt	7	7,2
Manually	2	2,1
Cash Registered	5	5,2
Computerized	83	85.6
<b>Price Information</b>		
In cashier	14	14,4
price tags	2	2,1
Price tags & in chashier	80	82,5
Self tagging available	1	1
<b>Price Change Information</b>		
In cashier	4	4,1
Price tag changes	2	2,1
Update database without replace the label	12	12,4
Update database and replace the label	79	81,4
<b>Payment method</b>		
Cash	51	52.6
Cash & Debit/ Credit Cards	46	47.4
Total	97	100.0

Reference: Data Processing

Minimarket should ideally be able to generate a shopping receipt from the output of a special application. With a receipt, the consumer can ascertain whether the payment is matched with the price of the purchased item. Table 3 shows that 85.6% of minimarkets have issued automated sales receipts through computerized sales applications. Uncomputerized shopping receipts created either by handwritten or using manual cash register. Only 7 minimarkets (7.2%) did not use the application so they did not publish the receipt. An interesting finding on this research is that there are some minimarkets that, although already have sales applications with these facilities, but do not publish a shopping receipt unless requested by consumers. This condition is usually found in a small minimarkets that do not have employees, and only run by the owner or close

family. The limitation of technical knowledge during recurring errors in the system, raises the notion that the computerized system only slows down the sales process.

Price information is needed by the customer before making a purchase. Traditionally, price information given orally. This may be done when the type of product sold is still small. When the types of products sold vary greatly, the price tags help reduce the intensity of orally pricing information to consumers. The hardware development provides a lot of convenience in delivering information about a product price. The availability of tagging or scanners makes consumers easier, more flexible, and faster to get price information.

Survey result shows that there are 2 minimarkets (2,1%) only use price tag without followed by shopping receipt. This is because that both minimarkets do not have a sales application program yet. The survey also found 14 minimarkets (14.4%) who already use the sales transactions application but price information only provide through the counter, either by display or printed receipt. 82.5% minimarkets are already use sales applications but still rely on price tags. This method use with the consideration of consumers generally prefer to get price information through product labels. The relatively large investment to provide tagging facilities for consumers makes only certain minimarkets provide this facility.

Actually, database utilization provides many advantages when minimarket updates the product prices. But at the minimarkets that still rely on labeling methods (although already have sales applications), database updating should be followed by one by one price tags replacement which is quite time-consuming. Carelessness in changing labels has the potential to bring conflict with buyers, due to the difference between the price on the label and the actual price when making a payment at the checkout. Therefore, shopkeepers must have a high level of accuracy. A number of mini markets anticipate it by giving price tags on certain products, whose prices do not change quickly.

The survey found 81.4% of minimarkets undergo this condition. 12% only updates the database without changing the label, 2.1% updates the label without updating the database, while 4.1% passes the price change through the cashier.

The society is getting smarter, choosy and demanding. Consumers not only demand quality products at reasonable price, but also require speed, safety, convenience, ease and efficiency of time. Thus, the minimarket manager must be aware that the payment system in the economic transactions is progress rapidly along with the sophisticated technology development. Technological advances in payment systems are beginning to replace the role of cash. Cash payments commonly known in public as a means of payment are now turning into non-cash payments which are more effective and efficient.

Therefore, to meet the consumers demands, the business must provide alternative payment transactions using non-cash payment system, through credit card or debit.

From 97 minimarkets respondent, only 46 minimarkets (47.4%) provide credit/ debit card facilities, while the rest (52.6%) receive cash payment only. Beside the limited information on how to establish cooperation with banks, minimarket managers generally still choose cash into their coffers. It can not be done with non-cash facility, because every non-cash transaction requires periodic bank reconciliation (every month). Some business owners feel this process takes time and effort to get back the money from the transaction. Moreover, cooperation with banks also requires cost consequences.

#### 4.2.2. Description of TPS Utilization in Inventory Management

Inventory control is a very important managerial function, because the internal inventory control involves a lot of investment and affects the effectiveness and efficiency of the company's activities. Internal control over goods supply is necessary to reduce the risk of difference, loss, and also in anticipation of possible fraud.

Inventory report is considered vital to provide useful information for the company. Errors in inventory recording will also lead to errors in determining the profits earned. Long stored inventory in the warehouse will make the goods expire, thus resulting in a loss and also increased cost.

Basically, the inventory information system aims to produce accurate, relevant and timely information. The inventory movements are continuous by involving the ordering and selling activities. There are at least three basic information needed by minimarkets, namely: information of existing inventory, when reservations should be made, and how to record the inventory. Table 4 describes how important inventory information is obtained by minimarkets.

Table 4 can be seen that only 5 minimarkets (5.2%) get inventory information through a connected system with sales. Most minimarkets (94.8%) get inventory information quantities through manual counting. Most minimarket managers prefer manual counting, because they believe manual calculations are more accurate, but the information can not be obtained quickly. In addition, there are often differences data between the system with the real number. This difference occurs because of several things, such as missing supplies, returns for expired products which are not inputted to the system, even an error code during entry into the system.

TABLE 4: Descriptive of TPS Utilization in Inventory Management.

Inventory Management Activities	Total	%
<b>Inventory Recording Method</b>		
Manual calculations	92	94,8
Using information / data from inventory system that is not connected with the cashier	0	0
Inventory System connected to Cashier	5	5,2
<b>Quantity</b>	97	100
<b>Ordering supplies Method</b>		
Unplanned	37	38,1
Planned with manual records	49	50,6
Planned with General applications/ Excel	1	1
Planned with Information Systems	10	10,3
<b>Quantity</b>	97	100
<b>Inventory Recording Method</b>		
Without recording (saving invoices)	15	15,5
Noted on Paper / book	3	3,1
Recorded by Computer general application / excel	0	0
Entry to a custom application system either with barcode or not	79	81,4
<b>Quantity</b>	97	100

Reference: Data Processing

The ability of inventory and sales system in providing quality information will greatly assist managers in making inventory orders. The survey found only 10 (10.3%) mini-markets who have made inventory ordering plans using information provided by the sales application. Interesting finding for this section is that, although most minimarkets already use the application program, 50.6% of them just do not use information from the application but rely more on manual records by performing a physical examination first. In addition to the limited workers to do the entry process and forecast the inventory, the difference between the physical number with the number on the computer makes the manager less trustworthy on the results released by the system.

Another interesting finding is that there are 33 (38.1%) minimarkets that do not make planning at all. Managers solely rely on records held by suppliers who periodically carry out visits, because they do not have good records (not recorded at all, or only recorded on the books).

### 4.2.3. Description of Transaction Processing System Output Utilization In Financial Statements.

Beside marketing activities, accounting/ finance section is an important support element at the operational level. Nevertheless, the information generated by the financial department is needed for higher levels management, especially for decision making at the tactical to strategic levels. The financial statements basically provide an overview of the financial condition of the company, shown from the corporate value of wealth (wealth) and debt as reflected on the company balance sheet. The financial statements are the result of an accounting process that can be used as a means of communication between financial data or company activities with another parties that are concerned with company data or activity.

The accounting process will involve several important activities in practice, one of which is sales activities. The sales application output will becomes the input for accounting and financial processes. The computerized sales transactions record will be very helpful to create reliable financial information. The utilization of transaction processing system output in the processing of financial statements, can be seen in Table 5.

TABLE 5: The Descriptive of TSP Output Utilization in Financial Report Processing.

The Need to Make a Financial Report	Total	%
Not Creating a Financial Report	3	3,1
Create Financial Report using application program that is not connected with the information system	80	82,5
Create Financial Report through Connected Application	14	14,4
Quantity	97	100

Reference: Data Processing

Table 5 shows that most minimarkets already understand the importance of financial report. It can be seen that only 3 minimarkets that did not make a financial report, while 94 others have made it. 80 out of 94 minimarkets have not utilized information from connected applications for financial reporting needs. Financial reports are created manually (using a general spreadsheet application) by utilizing the outcomes of the sales and inventory transaction processing system.

The lack of owners knowledge about the information technology systems utilization for financial statements, found in most mini markets. Only 14 minimarkets had getting operational effectiveness of financial report creation through connected applications.

## 5. Conclusions

The research result show that the mapping survey of the utilization level of Transaction Processing System (TPS) on Minimarket in Padang City still shows the gap between customer service utilization with inventory management and financial position utilization. TPS has been utilized for customer service need by most of minimarket, but not yet used for inventory management and financial position report. This research has not been much discussed the utilization of TPS such as for the management of receivable accounts, debt management, goods delivery, and so forth. It is therefore desirable for the next researcher to examine such other uses. TPS provides many facilities and benefits for minimarket managers. Implementation of TPS will make the job easier, faster and more accurate. Managers can take decision quickly and precisely, and the operational management will be more effective and achieve competitive advantage.

## References

- [1] Al-tarawneh, W.A.(2015)' The Impact of Transaction Processing Systems in Making Operational Decisions: A Case Study of Computerizing The Employees Affairs Departement of Al-Balqa Applied University Al Karak, *European Scientific Journal*, 11 (9), pp. 188-203
- [2] Amin, M. Bin, & Science, C. (2012). Business Transaction Processing System, *International Journal of Computer Information System.*, 4(5), 11–15.
- [3] Arbie, Erwan., (2000). *Pengantar Sistem Informasi manajemen*, 7th Edition, Volume 1, Bina Alumni Indonesia, Jakarta.
- [4] Brien, T.O. (2015).”Accounting” for data quality in enterprise systems’, *Procedia-Computer Science*. 64.pp 442-449.doi: 10.1016/j.procs.2015.08.539.
- [5] Chan, S.L (2000) ‘Information Technology in business process’ *Business Process Management Journal*, 6 (3), pp 224-237., doi:10.1108/146371500103254444.
- [6] Gainau, P., & Kurniawati, E. (2011). Evaluasi Sistem Pemrosesan Transaksi Dalam Menunjang Keunggulan Kompetitif di Universitas Kristen Satya Wacana, 1–10. Retrieved from <http://repository.library.uksw.edu/handle/123456789/252>
- [7] Goslar, M. D., & Brown, S. W. (1986). Decision Support Systems: Advantages in Consumer Marketing., *Journal of Consumer Marketing*, 3(3).pp 43-50.doi: 10.1108/eb008169.
- [8] Jogiyanto, HM. 2005. “*Analysis and Design of Information Systems Theoretical Structured Approach and Practice of Business Applications*”. Yogyakarta: Andi

Offset.

- [9] Lari, A.(2002). 'An Integrated information system for Quality management' *Business Process management*, 8 (2). pp.169-182., <https://doi.org/10.1108/14637150210425126>
- [10] Mahar, F. (2003). 'Role of Information Technology in Transaction Processing System'. *Pakistan Journal of Information and technology*, Asian Network for Scientific information, Vol 2 (2). pp 128-134. <https://doi.org/10.3923/itj.2003.128.134>
- [11] Abunar., SM & Zerban, AM. (2016). Enhancing Accounting Information Systems to Facilitate Supply Chain Management between Supermarkets/Suppliers: The Case of Saudi Arabia. *Journal of Accounting & Marketing*, 5(2), pp 1-7. <https://doi.org/10.4172/2168-9601.1000158>
- [12] Muarif. (2009). *Rahasia Orang Sukses Minang di Perantauan*: Pinus Book Publisher, Yogyakarta
- [13] Rahmatian, S. (2003). 'Transaction Processing Systems' *Encyclopedia of Information System*. 4. pp. 479-488.
- [14] Trigo, A., Belfo, F. and Perez, R. (2014) 'Accounting Information System: The Challenge of the Real – Time Reporting', *Procedia Technology*, 16, pp. 118-127. doi: 10.1016/j.protcy.2014.10.075.
- [15] Vlahos, G.E., Ferratt, T.W and Knoepfle, G. (2004) "The use of computer-based information systems by German managers to support decision making'. *Information & Management*. 41(6), pp 763-779. doi: 10.1016/j.im.2003.06.003.
- [16] Zhang, M.J. and Lado, A.A. (2001). Information systems and competitive advantage: a competency based view. *Technovation*, 21(3): 147-156.