Effects of Computerized Accounting Information System (CAIS) on the Just-in-Time (JIT) Production Technique: A Study of selected Manufacturing Firms in Delta State

Onatuyeh, E. A.
Aniefor, S. J.
Department of Accountancy, School of Business Studies,
Delta State Polytechnic, Ozoro, Delta State, Nigeria.
E-mail: edwin.onatuyeh@yahoo.com, anieforjones@yahoo.com

ABSTRACT

This study explored the effects that computerized accounting information system (CAIS) could have on Just-in-Time Scheme. Specifically, this study examines how the use of CAIS can facilitate the efficient operation of JIT production system in an organization in order to bring about cost and time savings. Drawn from a survey were 76 respondents randomly selected from ten manufacturing companies in Delta State of Nigeria. Frequency tables and simple percentage were used for the presentation of data and the hypotheses formulated were tested using Kolmogorov-Smirnov statistic. Findings reveal a positive relationship between computerized accounting information system and Just-in-Time production system. The study also reveals a positive relationship between an online accounting system and timely/accurate processing of purchase requisitions. Surprisingly, result of this study did not support the proposition that a computerized accounting information system driven-JIT structure can help improve customer relationship with the company and its market share. The study concludes with a number of recommendations, including, the need for Delta State Government to subsidize the transition of manufacturing companies in the State from manual accounting functions to computerized accounting functions, to enhance the mechanism of taxation which will boost her internally generated revenue profile.

Keywords: *Accounting Information System, Just in Time System, Computer, Information and Communication Technology, Accounting functions.*

INTRODUCTION

The current revolution in information and communication technology (ICT) is affecting many aspects of business activity, and this revolution has had a significant influence on accounting information system (AIS). Improvements in the ICT have brought improvements in the use of computers (Trunk, 2000; Nash, 1989). Today, almost all organizations are using computers in their daily businesses (Romney, Steinbart, and Cushing, 1997; Deluzio, 1993). As computers become smaller, faster, easier to use, and less expensive, the computerization of accounting work will continue (Santangelo, 2002). Accounting functions that were previously performed manually can now be performed with the use of computers. That is, accountants are now able to perform their activities more effectively and efficiently than before

(Santangelo, 2002). Many manufacturing companies are now operating JIT system so as to provide their customers with timely quality goods and services, and minimize all kinds of inventories and inventory-related costs (Grabski and Marsh, 1994). In the same vein, Grabski and Marsh (2010) argue that the Information and Communications Technology (ICT), particularly computerized accounting information system can be used to facilitate the efficient operation of JIT production system in an organization in order to bring about cost and time savings (Atrill, 2002). McMahon (2002) finds that ICTs, if properly implemented, can be a source of value creation to firms and can positively impact on organizational performance. Examples of ICTs value creation in firms can be in process planning and support improvement; supplier linkages (Da Costa, 2001); improving customer relationship as well as using computerized accounting information systems to support the efficient operation of the JIT system in order to bring about cost savings (Atrill, 2002) and increased market share and profitability (Roche and Michael, 2000).

The aim of this study, therefore, is to analyze the effect of ICT on JIT production system with emphasis on how management /cost accountants can make use of computerized AIS to facilitate the efficient operation of JIT production system in an organization in order to bring about cost and time savings. To guide this study, the following research hypotheses were formulated:

$H_0$1: Computerized accounting information system (CAIS) does not facilitate application of a JIT production system which can keep track of raw materials left in the store and automatically send an order for replenishment when needed.

$H_0$2: By enhancing JIT production, CAIS does not help to improve customer relationship with the company and consequently increase the customer base and market share of the company

$H_0$3: The use of online accounting system does not enable the company to send purchase orders to vendors accurately and timely without having to go through the rigours of processing purchase requisitions manually.

Accounting Information System (AIS) and Computerized Accounting Information Systems (CAIS)

Accounting information systems are information systems that record and report business transactions, the flow of funds through an organization and produce financial statements (Ofurum and Ogbonna, 2008). They are designed to make the accomplishment of accounting function possible. AIS processes data and transactions to provide users with the information they need to plan, control, and operate their businesses (Romney, Steinbart, and Cushing, 1997). An accounting information system can be a manual system, or a computerized system. The revolution in the information systems, which started in the early 1950s when the first business computers became available, is still in progress (Nash, 1989). Large

mainframe computers have been replaced by small and fast personal computers at lower costs. As a result, accounting information systems that were previously performed manually are now performed by computers in most companies (Romney, Steinbart, and Cushing, 1997). According to Wu (1984), quoted in Ofurum and Ogbonna (2008), computers do not change the objective or function of AIS which is to provide information relevant to the needs of users of information, but do alter the method AIS processes data to generate information and these methods are developed. For instance, companies can now capture, process, store, and transmit data with the help of computers quickly with little or no error(s). Whereas data collections and processing were performed manually in historical systems, on-line collection and processing of data are now being performed by computerized systems (Grabski and Marsh, 1994). Basic components of a computerized accounting information system, according to Grabski and Marsh (2010) are discussed below:

Data input function: With this function, data are captured and converted into machine-readable, as against manual AIS where data are captured from source documents, directly processed through journals to ledger accounts (Trunk, 2000; Romney, Steinbart, and Cushing, 1997). For example, bar code scanners used in retail stores automatically records record sale transactions into the accounting information systems as scanning devices read the codes on the products.

Data processing: Data collected and entered into computers are processed. The most common data processing activity is data maintenance which is the processing of transactions to update stored data (Trunk, 2000; Romney, Steinbart, and Cushing, 1997). For example, when sales transaction takes place, data are entered into the computer which in turn immediately updates sales and accounts receivable files, thus avoiding the rigours of having to manually update sales records, accounts receivable records.

Information output: Data processed into information should meet the needs of the users (Nash, 1989). Information is presented in three forms: a document, a report, or a response to a query. Documents are records of transactions or company data such as invoices. These documents can be printed out using printers. Reports are prepared for internal and external users – accounts payables, potential investors etc. With computerized AIS, all the information is gathered in relational tables, making it quite easy for records to be updated or produced at any time (Nash, 1989); a feature that will be difficult to achieve with a manual accounting system (Trunk, 2000).

Computerized AIS and JIT Production System

As explained in the preceding section, JIT production system aims at producing products just in time so that the inventory levels can be minimized (Bailes and Kleinsorge, 1992). When a need arises for production, raw materials should be ordered and received immediately, and finished goods sent to customers as soon

as possible because under a JIT production system, according to McBride, and Sheilah (2000), finished goods inventory should not wait in the inventory so as to reduce inventory and storage costs. Accounting systems must be modified to suit the needs of new manufacturing environments (O'Brien and Sivaramakrishnan, 1996) and therefore, the computerization of manual AIS to facilitate the efficient operationalization of the JIT production system become imperative.

How CAIS can facilitate Operation of JIT Production System in an organization

Purchasing strategy is critical to the success of a JIT system. Companies may employ online databases with catalogs connected to the suppliers' computers which will enable them send orders to their vendors via network by mere click of the mouse without having to go through the rigors of processing purchase requisitions manually (Trunk, 2000). Fortunately, electronic documentation reduces the cost and time required to process the purchase requisitions. The use of on-line processing systems linking purchasing and production gives accurate and timely perpetual inventory records. In this case, computer can be programmed to keep track of the inventory levels and automatically generate purchase requisitions when quantity on hand falls below the reorder point (Milligan, 1999; Miller and Kelle, 1998). When the purchase requisitions are approved, purchase orders should be transmitted to vendors via electronic data interchange (EDI). Transmitting the purchase orders via EDI reduces costs by eliminating printing and mailing paper documents (Milligan, 1999). Thus, the use of electronic commerce supports the application of JIT production system (Horngren, Bhimani and Goerge, 2002).

Electronic sales systems: Another way ICT can positively influence JIT system is through the use of an electronic sales system that enable products to be sold to customers within the shortest time available. Network connections can be established with customers so that customer's inventory can be replenished immediately when customers run out of stock. While replenishing inventory, the computer system immediately performs/updates all accounting records relating to each transaction (Miller and Keller, 1998). Automated warehouse systems consisting of computers and bar-code scanners can be used to facilitate shipping and warehousing procedures (Borthick, 1996; Schwartz and McGovern, 1998), thus reducing the time and cost of moving inventory out of the warehouse. For example, forklifts may be equipped with radio frequency data communication (RFDC) terminals to provide drivers with information about which items to pick next and where they are located. Once picked, items are run through a bar-code scanner. This procedure provides real-time and accurate recording of movements of the inventory, which is essential for the perpetual inventory systems (Schwartz and McGovern, 1998). Data communication terminals keep track of the inventory records as well. Thus, time-consuming manual work is eliminated.

Electronic Data Interchange/Electronic Fund Transfer: Some companies may prefer not to send the finished goods to customers until they receive cash from them. Therefore, they prepare invoices, send them to customers, and receive the cash. It takes time when companies perform these processes manually (O'Brien and Sivaramakrishnan, 1996). The problem is that, finished-goods wait in the inventory until company receives the cash (Schwartz and McGovern, 1998).

If companies switch to on-line invoice processing, they can print as soon as a notification is received from the shipping department that the order has been shipped. Once the invoices are prepared, they are sent to customers using electronic data interchange equipment (Miller and Keller, 1998). The use of electronic data interchange (EDI) leads to quicker billing. In addition, costs are reduced because paper processing is eliminated. When electronic images of bills are sent to customers, system immediately makes necessary changes in related customer accounts.

Thus, accountants can easily log on the computer and retrieve necessary information when needed. In manual systems, customer payment may be subject to a delay arising from the mail system, and time lag between when the cheques are deposited and when the bank makes those funds available to the company (O'Brien and Sivaramakrishnan, 1996). Electronic fund transfer (EFT) provides an opportunity for customers to send their payments electronically to the company's bank account. Therefore, the use of EFT eliminates the delays that may either come from the post or bank.

Computerized AIS and Pull method: Automating production procedures facilitate the application of a JIT system. Sequential processes in a production system can be connected via electronic data interchange systems to exchange information on a timely basis (Atkinson, Banker, Kaplan and Young, 2001). Assembly department can be connected with the warehouse electronically (Miller and Keller, 1998). The computerized AIS can keep track of raw materials on hand in the manufacturing area and automatically sends an order to the warehouse when these materials are needed (O'Brien and Sivaramakrishnan, 1996). In addition, the computerized AIS can update related accounts quickly.

For example, when raw materials are sent from a warehouse to a production department, the computer immediately updates raw-material inventory and work-in-process accounts. When a production department runs out of materials a signal is sent instantly to the preceding department. In this case, the preceding department can supply the needed materials at once. This means that automation of accounting system eliminates the causes of delays in the production process. Thus, risk of running out of raw materials even if sufficient quantities are available in the warehouse is minimized (Hilton, Maher and Selto, 2000; Miller and Keller, 1998). As a result, the risk of late deliveries of products to customers is eliminated.

METHOD

The data used in this study were collected through a survey among manufacturing companies in Delta State, one of the Oil rich States in Nigeria. The population of this study comprises all the manufacturing companies in Delta State. However, the sample of the study was selected from five major cities in the State. From the total number of manufacturing companies in the State, 10 were randomly selected. These companies are located in Asaba, Warri, Agbor, Sapele and Ughelli. A total of 100 copies of questionnaire (10 copies to each company) was administered to the respondents in the ten companies selected. The questionnaire included items adopted from previous researches as well as ones developed by the researchers. It consists of 2 parts, A and B. Part A consists of personal data of the respondents, while part B contains general questions relating to the study. The questions contained in part B are of two categories: open ended and close ended questions. The open ended questions required the respondents to provide brief written answers to the questions based on their own opinion, while the closed ended questions were drawn along Likert format: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD) and these require the respondents to choose from the options by ticking the appropriate boxes provided.

The questionnaire was meant for IT managers, accountants, purchasing/ marketing managers, and production managers accompanied by a cover letter explaining the objectives of this survey were personally handed to each company by the researchers, and this was followed up by telephone calls to motivate them to act. To ensure a high response rate, copies of the questionnaire were sent a second time to those participants who lost the earlier ones. Again, this was followed up by regular visits in order to clarify any difficulty some of the participants might have in filling the questionnaire. Eventually, 89 percent response rate were made. After eliminating responses due to large proportions of missing data, a final sample of 76 cases was obtained.

The group (Information Technology Managers, accountants, Marketing Managers, and Production Managers) was selected as respondents because they have been identified in extant literature as likely to be knowledgeable about either Accounting information system or JIT production/purchasing. Before the actual research, the research instrument was validated using theoretical validity and contents validity. The theoretical validity of this study was established by developing the measures of the variables under study from well - grounded theory and literature from other studies. The contents validity was established by giving a set of the draft questionnaire to experts in the field and three top mangers of the organizations. These experts reviewed the contents of the item in each of the instruments and affirmed that the items were within the linguistic capabilities and understanding of the respondents.

Frequency tables and simple percentage were used for the presentation of data and the hypotheses formulated were tested using Kolmogorov-Smirnov statistic. This tool looks at the degree of agreement between the distribution of the observed values and some specified theoretical distribution (expected frequencies) and it focuses on the largest value of the deviations among observed and theoretical proportions. The theoretical distribution represents what would be expected under the null hypothesis. It treats individual observation separately unlike Chi-square test for one sample. It needs not lose information through the combination of categories and so, it is more powerful than Chi-square statistic (Siegel, 1956). The Kolmogorov-Smirnov statistic is given as:

$$DF_N = Max_x / F^o(x) - F_o(x) /$$

Where, F is the number of observations; $F^o(x)$ is the specified (or theoretical) cumulative frequency distribution under H_0 for any value of X; $F_o(x)$ is the observed cumulative frequency distribution of a random sample of N observation for any value of X. The procedure is as follows: specify the null hypothesis; specify the level of significance; state the decision rule. The degree of freedom is measured against 95% level of significance. The critical value of D for sample size of N> 35 is given as:

$$DF_N = Max_x / F^o(x) - F_o(x) /$$

The decision rule is that H_0 will be rejected if the calculated D (D_{cal}) is greater than the tabulated D (D_{tab}) under the deviation level of 5%

RESULTS AND DISCUSSION

As shown on table 1, about 59% of the respondents agree that computerized accounting information system can enhance the effective and efficient performance of accounting functions and production activities while the rest disagreed. This emphasises the relevance of CAIS to both accounting and production functions in an organization. This result is in agreement with the findings of Santangelo (2002) who states that accountants are now able to perform their activities more effectively than before with the use of computers. The result also supports the position of Roche and Michael (2000) on the positive influence of computerized AIS over JIT production system. Majority of the respondents believe that computerized accounting information system can be used to facilitate the efficient operation of JIT production to bring about cost and time savings (table 2). They, however, added that most of their operations are yet to be computerized due to the cost implication. Nevertheless, this result corroborates the views of Grabski and Marsh (2010) who argue that a

JIT scheme driven by computerized AIS can efficiently reduce cost and time. Table 3 shows that about 39% of the respondents agree that the use of computerized accounting information system can lead to quicker billing, and reduce costs due to the elimination of paper processing, while 42% disagreed. Though this study's findings do not align with that of Miller and Keller (1998) who state that the use of CAIS via Electronic Data Interchange (EDI) leads to quicker billing and reduction in costs due to the elimination of paper processing, yet it takes time when a company processes invoices manually (O'Brien and Sivaramakrishnan, 1996).

Schwartz and McGovern (1998) note that manual processing of invoices make finished goods to wait in inventory until the company receives the cash. In simple term, an accounting information system that is properly supported by efficient IT facility as well as IT managerial capability may help to quicken billing processes, reduce all costs related to manual processing, save time and ensure increased profitability for the company. From the Kolmogorov-Smirnov frequency table for Hypothesis 1, the calculated D value is the point of greatest divergence between the cumulative observed and cumulative theoretical distributions, which is 0.126.

In this case, D_{cal} is less than D_{tab} ($0.126 < 0.155$) and thus, in accordance with the decision rule, the null hypothesis, which states that CAIS does not facilitate application of a JIT production system as it can keep track of raw materials left in the store and automatically send an order for replenishment when needed is rejected (Table 4). This indicates that there is general belief among manufacturing companies in the State that just-in-time system can be more effective when supported by a computerized accounting information system. This result supports the earlier findings of O'Brien and Sivaramakrishnan (1996) that CAIS can keep track of raw materials on hand in the manufacturing area and automatically sends an order to the warehouse when materials are needed. From the Kolmogorov-Smirnov frequency table for Hypothesis 2, the calculated D value is the point of greatest divergence between the cumulative observed and cumulative theoretical distributions, which is 0.245. The tabulated D value from the Kolmogorov-Smirnov test table is given as 0.155.

In this case, D_{cal} is greater than D_{tab} ($0.245 > 0.155$) thus, in accordance with the decision rule, the null hypothesis, which proposes that by enhancing JIT production, CAIS does not help to improve customer relationship with the company and thus increase the customer base and market share is therefore accepted (table 5). This result is not in consonance with the findings of Miller and Keller (1998) who argue that enhanced JIT production/purchasing system can lead to customer satisfaction and overall firm customer base. This is quite surprising given the initial findings of this study that CAIS be used to facilitate the efficient operation of JIT production system to bring about cost and time savings. If an overwhelming majority of the respondents had reported that an efficient operation of the JIT system can lead to time savings (good customer service in terms of service delivery), then a subsequent finding that an enhanced JIT system cannot lead to improved customer

relationship not only becomes contradicting but also worrying. This is because good business/customer relationship is a by-product of good customer services. Perhaps, the tradition of poor attitude among most companies in Delta State in particular and Nigeria in general towards building structure for good customer relationship management now affect how customer service related issues are addressed. From the Kolmogorov-Smirnov frequency table for Hypothesis 3, the calculated D value is the point of greatest divergence between the cumulative observed and cumulative theoretical distributions, which is 0.126. In this case, D_{cal} is less than D_{tab} (0.126 <0.155) thus, in accordance with the decision rule, the null hypothesis, which proposes that the use of online accounting system will not enable the company to send purchase orders to vendors accurately and timely without having to go through the rigours of processing purchase requisitions manually is therefore rejected (table 6). This implies that the use of Online Accounting System enables the company to send Purchase Orders to vendors accurately without having to go through the rigours of Processing Purchase Orders manually.

The result synchronizes with the findings of Trunk (2000) who argues that companies often employ online databases with catalogs connected to suppliers' computers to enable them send orders to their vendors via network without going through the rigours of manual processing of requisitions. By presenting the results of a questionnaire addressed to respondents (IT managers, accountants, purchasing managers and production managers) in ten selected manufacturing companies in Delta State, this study provides evidence of a strong relationship between computerized accounting information system and Just-in-Time system as the Kolmogorov-Smirnov Statistic has revealed that computerized accounting information system facilitates the application of a JIT system in the shape of efficient tracking of raw materials left in the store and automatically orders for a replenishment when needed. This study also established a strong positive relationship between an online accounting system and timely/accurate processing of purchase requisitions. Surprisingly, result of this study did not support the proposition that a computerized accounting information system driven-JIT system can help improve customer relationship with the company and its market share. The study highlights continued tradition of poor attitude among companies in the State towards building structure for good customer relationship management as plausible reason for this finding. Finally, the study revealed that most of the manufacturing companies sampled are yet to computerize their operations, including significant portion of their accounting functions. The respondents identified insufficient fund as a major reason.

CONCLUSION AND RECOMMENDATIONS

The contemporary revolution in information and communication technology (ICT) has had a significant influence on accounting information system (AIS). Developments in the ICT have brought improvements in the use of computers that most companies

now use them to carry out activities previously performed manually. On the other hand, many manufacturing companies currently operate JIT system so as to provide customers with timely quality goods and services, and minimize all kinds of inventories and inventory-related costs. Extant literature has argued that the Information and Communications Technology (ICT), particularly computerized accounting information system can be used to facilitate the efficient operation of JIT system in an organization. However, management of manufacturing companies should make concerted efforts towards computerising their operations. As demonstrated in the course of the study, companies operating a JIT system (production or purchasing) may as well operate it more effectively if they use computerized systems. Computerized accounting systems and such tools as electronic data interchange and electronic funds transfer can provide companies with opportunities to operate JIT production system more effectively and consequently, save money and time.

Also, an effective/efficient Just-in-system, computer training and education programme for staff should be encouraged. Consequently, such training programme should focus more on accounting, purchasing and production personnel. This is because e-accounting and production systems will involve staff from these departments. Encouragingly, some of the companies sampled, especially those in Asaba and Ughelli already have on ground ICT structure for staff development.

Finally, the Delta State Government, through its appropriate agencies, should offer easy access to computerised AISs by financing the purchasing of computerised AISs by manufacturing companies. This can be done in form of providing subsidies for computerized AISs purchased by the companies. When this is done, more manufacturing companies will be interested in transitting. By this gesture, the Delta State Government would be boosting its vision of running Delta State without 'oil proceeds', since more profits means more tax revenue.

Table 1: Computerized Accounting Information System enhances effective/efficient performance of accounting functions and production activities

Categories	Responses	Percentage	Cumulative (%)
Strongly Agree	10	13.16	
Agree	35	46.05	59.21
Undecided	15	19.74	19.74
Disagree	12	15.79	
Strongly Disagree	4	05.26	21.05
Total	76	100	100.00

Source: Field Survey, 2013

Table 2: Computerized Accounting Information System (CAIS) facilitates the efficient operation of JIT production to bring about cost and time savings

Categories	**Responses**	**Percentages**	**Cumulative (%)**
Strongly Agree	28	36.84	
Agree	29	39.47	76.31
Undecided	6	7.90	7.90
Disagree	10	13.16	
Strongly Disagree	2	2.63	15.79
Total	76	100	100.00

Source: Field Survey, 2013

Table 3: Computerized Accounting Information System (CAIS), through Electronic Data Interchange (EDI), cannot bring about quicker billing and cost reduction as paper processing is eliminated

Categories	Responses	Percentages	Cumulative (%)
Strongly Agree	15	19.74	
Agree	15	19.74	39.48
Undecided	14	18.42	18.42
Disagree	21	27.63	
Strongly Disagree	11	14.47	42.10
Total	76	100	100.00

Source: Field Survey, 2013

Table 4: Kolmogorov-Smirnov frequency table for Hypothesis 1

Hypothesis	Rank of View of Respondents				
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
F = CAIS facilitates application of A JIT production system as it can Keep track of raw materials left in the store and automatically send an order for replenishment when needed.	6	34	11	15	10
$F^o(X)$ = Theoretical cumulative distribution of choices under H_o	0.200	0.400	0.600	0.800	1
$F_o(X)$ = Cumulative distribution of observed choices under H_o	0.079	0.526	0.671	0.868	1
$DF_N = Max_x \; F^o(x) - F_o(x)$	0.121	0.126	0.071	0.068	0

Source: Field Survey, 2013

Table 5: Kolmogorov-Smirnov frequency table for Hypothesis 2

Hypothesis	Rank of View of Respondents				
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
F = By enhancing JIT production CAIS helps to improve customer relationship with the company and consequently increase the customer base and market share of the company	19	30	9	11	7
$F^o(X)$ = Theoretical cumulative distribution of choices under H_o	0.200	0.400	0.600	0.800	1
$F_o(X)$ = Cumulative distribution of observed choices under H_o	0.250	0.645	0.763	0.908	1
$DF_N = Max_x \; F^o(x) - F_o(x)$	0.050	0.245	0.163	0.108	0

Source: Field Survey, 2013

Table 6: Kolmogorov-Smirnov frequency table for Hypothesis 3

Hypothesis	**Rank of View of Respondents**				
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
F = The use of online accounting System will enable the company to Send purchase orders to vendors accurately and timely without having to go through the rigours of processing purchase requisitions manually.	7	33	11	14	11
$F^o(X)$ = Theoretical cumulative distribution of choices under H_o	0.200	0.400	0.600	0.800	1
$F_o(X)$ = Cumulative distribution of observed choices under H_o	0.092	0.526	0.671	0.855	1
$DF_N = Max_x \; F^o(x) - F_o(x)$	0.108	0.126	0.071	0.055	0

Source: Field Survey, 2013

REFERENCES

Atkinson, A. A., Banker, R. D., Kaplan, R. S. and **Young, S.M.** (2001). *Management Accounting* (3rd edition). Prentice Hall

Atrill, P. M. (2002). *Management Accounting for Non- Specislists* (3rd edition). Prentice Hall.

Bailes, J. C. and **Kleinsorge, I. K.** (1992). Cutting Waste with JIT. *Management Accounting*, 28 - 32.

Borthick, A. F. (1996). Helping Accountants Learn To Get the Information Managers Want: The Role of the Accounting Information Systems Course. *Journal of Information Systems*, 75-86.

Da Costa, E. (2001). Global E-Commerce Strategies for Small Businesses. Cambridge, MA: MIT Press.

DeLuzio, M. C. (1993). The Tools of JIT. *Journal of Cost Management*, Summer, 13-20.

Hayes, R. H. (1981) Why Japanese Factories Work. *Harvard Business Review*, July-August, 57-66.

Grabski, S. V. and **Marsh, R. J.** (2010). Integrating Accounting and Manufacturing Information Systems: An ABC and REA-Based Approach. *Journal of Information Systems*, 61-81.

Grabski, S. V. and **Marsh, R. J.** (1994) Integrating Accounting and Manufacturing Information Systems: An ABC and REA-Based Approach. *Journal of Information Systems*, 61-81.

Horngren, C. T., Bhimani, A, F. and **George, D., S.** (2002). *Management and Cost Accounting.* Prentice Hall.

Hilton, R. W., Maher, M. W. and **Selto, F. H.** (2000). *Cost Management* (International edition). New York: McGrawHill.

Horngren, C. T., Bhimani, A, F. and **George, D., S.** (2002). *Management and Cost Accounting* (2nd edition). Prentice Hall.

McBride, M., H. and **Sheilah, C. B.** (2000). Dock-To-Shop Is Just-In-Time. *IIE Solutions,* 34-41.

McMahon, P. (2002). *Global Control: Information Technology and Globalization Since 1845*. Cheltenham and Northampton, MA: Edward Elgar.

Miller, P. A .and **Kelle, P.** (1998). Quantitative Support for Buyer-Supplier Negotiation in Just-In-Time Purchasing. *International Journal of Purchasing and Materials Management,* 25-30.

Milligan, B. (1999). Just-in-time: What's It Going to Take To Make It Work, Purchasing? *International Journal of Purchasing and Materials Management,* 40-45.

Murthy U. S., Wiggins J. R. and **Casper E.** (1993). Object-Oriented Modelling Approaches for Designing Accounting Information System. *Journal of Information Systems*, 97-112.

Nash, John F. (1989). *Accounting Information Systems* (Second Edition). Kent: PWS Kent Publishing Company.

O'Brien, J. and **Sivaramakrishnan, K. C.** (1996). Order Processing and Production Scheduling in Order Initiated Production Environments. *Journal of Management Accounting,* 151-171.

Ofurum, C. O. and **Ogbonna G. N.** (2008). *Accounting Information Systems: A Functional Approach.* Owerri: Bon Publications.

Roche, E. M. and **Michael J. B.** (2000). *Information Technology in Multinational Enterprises.* Cheltenham and Northampton, MA: Edward Elgar.

Romney M. B., Steinbart, P. J. and **Cushing B. E.** (1997). *Accounting Information System* (Seventh Edition). Addison-Wesley.

Santangelo, G. D. (2002). *Innovation in Multinational Corporations in the Information Age: The Experience of the European ICT Industry.* Cheltenham and Northampton, MA: Edward Elgar.

Schwartz, B. M. and **McGovern, J. M.** (1998). Time versus Money: who's calling the shots? Transportation & Distribution. *Industrial Journal of Management and Data System,* 33-36.

Siegel S. (1956). *Nonparametric statistics for the behavioural science.* New York: Mc Graw –Hill Book Company.

Trunk, C. (2000). Manufacturing Systems Software: Bridging the Information Gap, Material Handling Management. *Journal of Cost Management,* 57-61