

The Impact of Information System (IS) on Organizational Performance: With Special Reference to Ethio-Telecom Southern Region, Hawassa

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Abstract

The Information System (IS) plays exactly the same role in the organization as the heart plays in our body. The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfil the information needs of an individual, a group of individuals, the management functionaries. Virtually, no business or organization, large or small, can compete without information system. We truly live in a wired world! This study aims to assess impact of information system on organizational performance with special reference to Ethio-telecom Southern Region, Hawassa, Ethiopia. During the study both qualitative and quantitative data were collected from 45 administrative staffs via questionnaire. The staffs were selected randomly on the basis of disproportionate stratified technique by categorizing them into three strata (i.e. top, middle, and lower lever management). The collected data were analysed using SPSS (20 version). As a result, employees' ethos toward information as critical asset is unsatisfactory, undermining the role of information system on organization endeavours, lack of top management to enhance the system are the chief problems in the organizations. On the other side, effective IS promotes organizational efficiency and effectiveness.

Keywords: IS, IS in an organization, organizational performance

1. Introduction

An Information System (IS) is basically concerned with the process of collecting, processing, storing and transmitting relevant information to support the management operations in any organizations. Drucker "the life of manager is a perpetual decision making activities". Shergill *et al* (2012), the success of decision-making, which is the heart of administrative process, is highly dependent on available information.

According to Todd (2001) and Harizanova (2003), Managers have to assimilate masses of data, convert that data into information, form conclusions about that information and make decisions leading to the achievement of business objectives. For an organization, information is as important resource as money, machinery and manpower. It is essential for the survival of the enterprise (Tripathi, 2011). To fulfil the needs of information the management of information system is critical for the prosperity of every business organization (Davies, 2009).

Organizational efficient operation is more than ever linked to effective information system. Today it is widely recognized that a "business information system (BIS)" is essential for most organizations to survive and compete with other organizations (Ibid). BIS assist companies to extend their business, offer services, reshape jobs, redesign work flows and modify the ways of controlling business (Lucas, 1993).

Proper handling and processing of information is necessary because it can decide in the overall fate of the organization. If organizations use information system in their operation properly, they will be on the position to achieve their goals whereas the reverse is true. One of the policies and strategies of the government of Ethiopia is to transform the telecom infrastructure and service to world class standard, considering this sector as a key lever to the development of country in fifth year Growth and Transformation Plan (GTP) from 2010/11-2014/15. IS expediting any organizational activities by providing critical information so, as one embedded organization, Ethio-telecom should consider the impact IS to achieve the desired performance in the sector.

2. Statement of the problem

Nowadays, Information system is vital to any organization (Porter and Miller, 2002). Irani (2001) argues that a successful and quality IS can bring enhanced efficiency and effectiveness in operation, possible better business performance and stronger organizational culture. According to Stair and Reynold (2010), IS means not only capture, process and disseminate information but good and quality information system. Quality information system is a system which contains relevance, accurate, complete, comprehensive, detail, flexible, reliable and timeliness information so as to ensure streamline its operations into a cohesive functioning unit, support business decision-making by providing management with critical data, and they serve to enhance the organization's communication, reduce human labor, support short- and long-term organizational goals, improving employees' productivity and distribute complex information.

However, not all IS having been successful in achieving efficient and effective organizational

performance (Shaukat, 2009). In a big organization, like Ethio telecom an integrated IS required to achieve the organizational goals and Growth and Transformation Plan (GTP). The prevalent dare of the Ethio telecom were negative organization information ethos, underestimate the role of IS, lack of latest technologies, and lack of top management commitment and support etc.

3. Research objectives

The prime purpose of this thesis is to assess the impact of information system on organizational performance with special reference to Ethio-telecom, southern region, Hawassa.

In addition to the aforementioned core objective, this study also stressed specifically on the following objectives.

1. To explore the ethos of the employees toward information as critical resource in the organization.
2. To assess top management's commitment to improve and support information system in the organization.
3. To examine how employees can be benefited from an information system to enhance organizational performance.
4. To know organizational characteristics that can determine the organizational performance via effective IS.

4. Research hypothesis

Ho₁: There is a significant information ethos difference between top level management and lower level management toward information as valuable asset at Ethio-telecom.

Ha₁: There is no significant information ethos difference between top level management and lower level management toward information as valuable asset at Ethio-telecom.

Ho₂: There is no significant correlation between IS and employees' productivity

Ha₂: There is a significant correlation between IS and employees' productivity

Ho₃: There is no significant impact of IS on organizational performance with reference to Ethio-telecom

Ha₃: There is a significant impact of IS on organizational performance with reference to Ethio-telecom

5. IS and organizational performance

An information system (IS) in an organization is like the nervous system in the human body: it is the link that connects all the organization's components (human resource, marketing, accounting and finance, operations (i.e. production and service) etc.) together and provides for better operation and survival in a competitive environment. Indeed, today's organizations run on information (Dandago, 2012)

Moreover, Managers need rapid access to information to make decisions about strategic, financial, marketing and operational issues and they are successfully handle information and applied it when making decisions. They see information as valuable asset, creation of information ethos is one part of ongoing process, and those companies which have successfully implemented change and created an information ethos have done so with the backing and leadership of the senior managers, and the CEO in particular (Owens et., al 1995).

Timely availability of relevant information is vital for effective performance of managerial functions such as planning, organizing, leading, and control. An information system in an organization is like the nervous system in the human body: it is the link that connects all the organization's components together and provides for better operation and survival in a competitive environment. Indeed, today's organizations' managers run on information (Ibid).

(Turban, 2001) Information systems affect individuals in various ways. An IS has great contribution to complete career effectively, to reduce error, reduce time to search documents, enhance productivity and supply quality information to make decision and to set plan (short term and long term). (Baker, 1993), Each day computers help millions of people do their jobs more effectively. For example, they can help managers decide on what action is most effective for the organization, computers assist in planning of future activities, and also assist in follow-up and control of activities in process. By using facts supplied by computers that are timely, relevant, and accurate, a manager can do a better job of identifying problems, opportunities, and solutions.

5.1. The impact of information system on organizational performance

Kehinde and Yusuf (2012) Information System is very important in an organization because no organization can survive without information. Hence, the importance of Management Information System cannot be over emphasized in the 21st Century the world over.

According to (Caranana, 2012), Information enables organization to make more accurate decisions. For this reason, the right amount of information at the right time is a key factor for every organization. Company managers take decisions, prepare plans and control their company's activities using information.

An IS plays a very important role in the organization, it creates an impact on the organization's functions, performance and productivity. The impact of IS on the functions is in its management. With a good support, the management of marketing, finance, production and personnel become more efficient. The IS

creates another impact in the organization which relates to the understanding of the business itself (Everest, 1976).

Since the IS works on the basic systems such as transaction processing and databases, the drudgery of the clerical work is transferred to the computerized system, relieving the human mind for better work and It creates an information- based work culture in the organization (mu.ac.in/mis).

5.1.1 Impact of IS on managers

Turban (2010) the use of computers and information technology/information system has brought many changes to organizations. These changes are being felt in different areas including the manager's job, structure, authority, power, and job content; employee career ladders and supervision. The most important task of managers is making decisions. Sekhar (2012) IS can change the manner in which many decisions are made, and consequently change managers' jobs. Many managers have reported that the computer has finally given them time to "get out of the office and into the field." Akewukereke *et al* (2010) Every organization's management makes decision, prepare, plans, and controls activities by using information which is obtained from two major sources namely: formal and informal sources such as face-to-face conversations e.g. telephone calls, social contacts and so on.

5.1.2 Impact of IS on employees

Caranana (2012) every person in the company needs or generates information, and therefore no person in an organization can be totally detached from its information system. (Baker, 1993) Each day computers help millions of people do their jobs more effectively. For example, they can help managers decide on what action is most effective for the organization, computers assist in planning of future activities, and also assist in follow-up and control of activities in process. By using facts supplied by computers that are timely, relevant, and accurate, a manager can do a better job of identifying problems, opportunities, and solutions.

According to Senn (1990), People in all jobs benefits in many ways from information system even they are not computer specialists. Each day IS helps a million of peoples do their jobs more effectively with greater efficiency, higher quality product or services, better information retrieval, eliminate paper works, instant share of information etc.

In spite of its positive impact information system has its own negative impact. The major limitation or negative impact of IS includes displace employees (eliminate jobs), violate privacy, information anxiety i.e. frustration, stress, injuries etc. (Ibid).

5.2 Organizational performance

Management as defined by Robbin and Coulter (2003) is the process of getting activities completed efficiently and effectively with and through other peoples. The process represents the functions or primary activities engaged in by manager. These functions are typically labeled planning, organizing, leading, and controlling. Each organization has certain objectives and main objective of every organization is to earn profits by increasing performance (Shaukat, 2012).

Sushil and Agrawal (2003) discussed that organizations are now composed of five major components: IT/IS, organizational structure & corporate culture, management & business processes, organization's strategy, individuals and roles. These components are in stable condition, called equilibrium, as long as no significant changes occur in the environment or in any of the components. However, as soon as a significant change occurs, the systems become unstable and it is necessary to adjust some or all of the internal components since all are inter-related. Unstable organizations may be unable to excel or even survive; therefore, organizations need to respond by what it is called critical response activities, which deal not only with long term strategies, but also with the basic daily business activities. (Mandel, 1994) now IT/IS has become a major facilitator of business activities in the world today to make organizations responsive and remain stable.

The performance as stated by Wheelen and Hunger (2000) is an end result of an activity and an organizational performance is accumulated end result of all the organization's work process and activities. Managers measure and control organization performance because it leads to better asset management, to an increased ability to provide customer value, to improve measures of organizational knowledge and measure of organizational performance do have an impact on an organization's reputation. Wetherbe *et. al.* (1999) When the performance of the organization is assessed, the past management decisions that shaped investments, operations and financing are measured to know whether all resources were used effectively, whether the profitability of the business met or even exceeded expectations, and whether financing choice were made prudently. The most frequently used organizational performance measures include organization efficiency (productivity), organizational effectiveness and industry ranking.

6. Research methodology

6.1. Research approach

The aim of this research is to explore the impact of information system on organizational performance. In doing so, the researcher used both qualitative and quantitative research approach. Quantitative research approach

gathers data which can quantify and analyzed statistically. It focuses on numerical data. Whereas, Qualitative research approach is designed to collect attributes or non-quantitative data aimed towards describing reality as experienced by the respondents (John Adams, 2007).

6.2. Research design

This study is descriptive study by selecting case area Ethio telecom, southern region. The reason behind is; such study is undertaken in order to ascertain and be able to describe the characteristics of the variables of interest in a situation. The goal of descriptive study, hence is to offer a profile or to describe relevant aspects of the phenomena of interest to the researcher from an individual, organizational, industry oriented or other perspective (Sekaran, 1999).

As far as the time horizon of the research is concern, the researcher applied cross-sectional study. The major aim of Cross sectional survey is to gather data at a particular point in time with the intention of describing the nature of existing conditions, or identifying standards against which existing conditions can be compared, or determining the relationships that exist between specific events. It is useful in that it usually: gathers data on a one-shot basis and hence is economical and efficient; represents a wide target population; generates numerical data; provides descriptive, inferential and explanatory information etc. (Sekaran, 1999, and Kothari, 2004).

6.3. Sampling Method

As to the sample size determination concerns, among different methods of sampling, the one which was developed by Carvalho (1984), and revised by Naresh (2007) employed for size determination. As result, from the total 418 employees 50 (12%) employees are believed to represent the whole population while drawing inference. *From the total 50 sample size, 19 of them are from lower level employees, 26 from middle level, and the remain 5 are from executives.*

6.4. Source of Data

In order to get all the necessary information on the area under which the research is conducted, both primary and secondary source of information are used. Primary data were collected using questionnaires and secondary data were gathered from difference reputable and reliable sources including the organization's reports.

6.5. Other Instruments and measurements

The researcher has applied Cronbach's Alpha to test reliability and validity scale of variables in the questionnaire. Reliability is defined as "an indicator of a measure's internal consistency". Validity is defined as "the accuracy of a measure or the extent to which a score truthfully represents a concept" coefficient alpha ranges from 0 (no internal consistency) to 1 (complete consistency). Scales with coefficient alpha between 0.8 and 0.95 are considered to have very good quality, scales with coefficient alpha between 0.7 and 0.8 are considered to have good reliability, and coefficient alpha between 0.6 and 0.7 indicates fair reliability (Zikmund et. al., 2010).

This research employed the internal consistency technique to test the scale reliability. The coefficient alpha was applied to measure an estimate the 5 point likert scales reliability. The scales used in this study showed very good level of internal consistency for impact of IS on performance (0.869) and for benefits of IS (0.825), good level of internal consistency for organizational characteristics (0.775).

6.6. Method of Data Analysis

After data have been collected from a representative sample of the population, the next step was to analyze them and to test research hypothesis. Before directly start analyzing the data, the researcher has made data ready for analysis like editing data (it is necessary to edit data before analyzing them because some respondents may answers questions in hurry), coding questionnaires (it helps to transcribe easily, saves time and error i.e. repetition) and entering data. Data analysis were routinely done with Personal Computer (PC) software programs mostly using Statistical Package for Social Studies (SPSS IBM V.20), Excel 2013 and the like. These are user friendly and interactive and have the capability to seamlessly interface with different database (Sekaran, 1999). These package has different kind of testing techniques. The researcher was analyzed data regarding the objective of the study by using descriptive statistical analysis and regression technique like frequencies, percentage cross tabulation (Chi-square goodness fit test), correlation test, linear regression model etc. and excellent graphs and charts were also produced from these software programs.

7. Conceptual framework of the study

An organization introduces information systems in an effort to improve efficiency and effectiveness. In order to fulfil its information processing needs, an organization must capture relevant data that are then manipulated, or processed, to produce an output that will be useful to the appropriate users, either internal or external to the firm

(Shaukat, 2009). A well-designed information system assists the organization to make sound decisions and to achieve organizational performance i.e. efficiency and effectiveness, delivering better service and promoting employees' productivity. This conceptual framework is built on Hurber's (1990) suggestion that IS a variable that can be used to enhance the quality and timelines of organizational intelligence and decision making thus, promote organizational performance. Hurber treats several organizational characteristics as independent variable, IS as moderator and organizational outcomes as dependent variables.

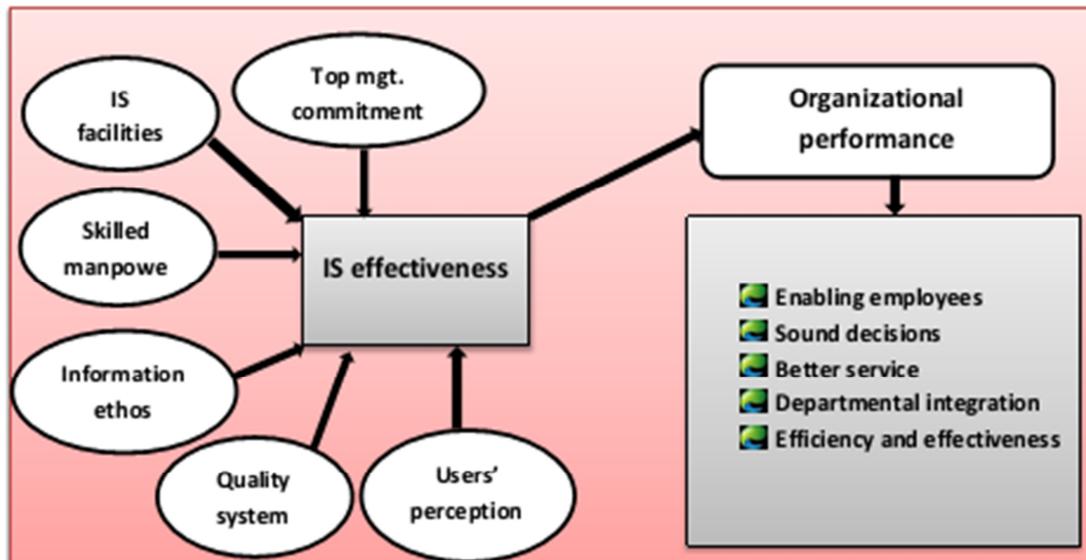


Figure 8.1. Framework of the study

From the above model we can observe that different organizational characteristics/factors i.e. Top management commitment and support, IS facilities, organization information ethos, skilled manpower, quality system and information and others can make information system effective on the organization to have effectiveness and efficiency. Hurber 1990 was treat IS as moderator variable but here it is independent variable and organizational factors as influential variable and organizational performance as dependent.

8. Major findings

The general purpose of hypothesis testing is to determine whether the sample data support or refute a hypothesis about the population. The hypothesis testing is a statistical procedure that allows researchers to use sample data to draw inferences about the population of interest. To test all hypotheses of this study, analyses were carried out by statistical techniques. The statistical software packages named SPSS 20.0 have been used for analysis. The following discussion presents the analyses/results of different hypotheses of the study with conclusion of every hypothesis at the end of each section. In this section, correlation test, chi-square goodness fit test and liner regression model have been applied to test the hypotheses.

Research hypothesis 1: there is no significant information ethos difference between top level management and lower level management toward information as valuable asset at Ethio-telecom.

Regarding the data outcome (i.e. result of Chi-square), relatively the top management's ethos toward IS as crucial asset, regardless of the middle level and lower level managements

On the other hand, the calculated chi-square value for the set of data analyzed (10.584) is greater than the chi-square table value (5.991), reject null hypothesis. In simple terms: there is a significance attitude difference between top level and lower level management toward information as valuable asset cannot be due to chance alone.

In this situation, the rejection of the null hypothesis means that the information ethos differences between the top level management and lower level employees are not due to chance. That is, they are not due to chance variation in the sample organization took; there is a real difference between them.

Research Hypothesis 2: There is no significant correlation between IS and employees' productivity.

Here, the researcher has applied correlation coefficient test- is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Pallant, 2010).

As a result, in simple term, there is a statistically significant correlations between IS and employees' productivity variables. That means, increases in IS do significantly relate to increases employees' productivity.

In addition to this, Information system enabling employees to complete their job effectively, to get right information at the right time, to share information, Employees do not have to collect data manually for filing and analysis, reduce error and repetition and helps them to supply quality information to decision makers.

Research Hypothesis 3: There is no significant impact of IS on organizational performance with reference to Ethio telecom

The next analysis is done by applying linear regression model. Regression output includes multiple regression, correlation between dependent and independent variables, coefficient of variables (shows the impact of each independent variables on dependent variable), model summary (which demonstrates how much dependent variables are explained by independent variables) and finally, ANOVA test (shows whether the regression result is statistically significant or not) (Shaukat, 2009).

From the regression analysis, each variables are positively associated each other. When we see their correlation separately: organizational performance with organizational performance perfect correlation (1), organizational performance with IS has large positive correlation (0.493), organizational performance with top management commitment and support strong positive relationship (0.662), organizational performance and IS facilities positively correlated (0.591), organizational performance and user experience positively correlated (0.427), user attitude and organizational performance has positive relationship (0.370), organizational performance and users perception positive relationship (0.375), organizational performance and quality system has strong positive correlation (0.542) and organizational performance with quality information has positive correlation (0.512). Likewise, IS and top management commitment and support 0.347 (positive relationship), IS effectiveness with IS facilities positively correlated (0.296) and so on.

If the correlation between variable is not known in advance we are obliged to select the two-tailed significance level when we test the correlation among variables (youtube.com). When organizational characteristics increase, IS effectiveness also increase and organizational performance will also promoted. Thus, Organizational characteristics leads to the IS effectiveness and effective IS leads to organizational performance.

To analyse the conceptual framework several independent variables were entered into the multiple regression equation: top management commitment and support, IS facilities, users experience, perception and attitude, quality system and information.

Unstandardized coefficient of an independent variables (also called beta or slope) measures the strength of its relationship with dependent variables (Pallant, 2010). Thus, the coefficient under this column “B (beta)” column of each factors shows impact each variables on organizational performance. As we can see on the above table a percentage increasing in one factor immediately reflects on the dependent variable (org. performance). For example, for each one percent increase in top management commitment, we predict a 0.285 (28.5 percent) increase in organizational performance, one percent increase IS tools can predict a 0.105 (10.5 percent) increase in organizational performance. Similarly, user experience, user attitude, users perception, quality system, and information quality adds organizational effectiveness by 0.105 (10.5 percent), 0.102(10.2 percent), 0.046 (4.6 percent), 0.014 (1.4 percent), 0.182(18.2 percent) and 0.000(0 percent) respectively. A coefficient 0.000 value for information quality means that the value of dependent variable do not consistently differ as the variable of the independent variable increase. In this case we can conclude that there is no linear relationship between information quality and organizational performance.

The B column also shows the constant, a statistic indicating the intercept—the predicted value of the dependent variable when the independent variable has a value of 0 (Pallant, 2010). In this case, if all organizational characteristics were zero then we will expect 36.6 percent organizational performance. Finally, since p-value of all independent variable is less than level of significance (0.05), we are fail to retain null hypothesis. So, “There is a significant impact of IS on organizational performance with reference to Ethio telecom”, thus, the Ha was accepted.

Furthermore, the study aims to identify which of the variables contributed the most to prediction of the dependent variable. This information can be investigated via Standardized coefficient. The standardized coefficients mean that “values for each of the different variables have been converted to the same scale so they can be compared”. In this study the highest Beta value is 0.482 for top management commitment and support, and second highest is 0.330 for quality system. Both independent variables are statistically significant since the Sig. value is less than 0.05. These results indicate that the variables top mgt. commitment and support quality system the strongest unique contribution in explaining the dependent variable organizational performance. The variable user perception provide low unique contribution in explaining the dependent variable (0.023) followed by users attitude (0.082) and information quality is not predictor of organizational performance.

Table 9.1. Regression model summary (IS effectiveness vs. organizational performance)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.842 ^a	.709	.654	.30185

From the above table 9.1. R (.842 or 84.2 percent) simply shows the Pearson correlation among

variable means there is strong correlation between dependent variable and independent variables. R square= 0.709 means almost 71 percent of the variation in organizational performance can be predicted by the IS effectiveness. The remaining 29 percent can be explained by other factors that are not in the model. The larger R² is the better (Pallant, 2010). And adjusted R square shows the impact of IS effectiveness (cumulative of top management commitment and support, IS facilities, users' experience, perception and attitude and quality system) on organizational performance. As a result 65.4 percent organizational performance is explained by the IS effectiveness. Adjusted R square is always less than R² because it takes degree of freedom into consideration and the larger adjusted R square is the better. And the smaller mean standard error (SME), the better (0.30185) (Pallant, 2010).

Generally, R² is the percentage of variation in Y (organizational performance) explained by the variable X (effectiveness of information system). Approximately 71 percent of the variation in Y can be explained by variable X.

Table 9.2. ANOVA test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	8.205	7	1.172	12.864	.000 ^b
1 Residual	3.371	37	.091		
Total	11.576	44			

a. Dependent Variable: org. performance

b. Predictors: (Constant), information quality , user experience, Top management commitment and support , IS facilities, user attitude , user perception , quality system

In a regression model, the ANOVA F statistic tests whether the model as a whole is significant or not. Thus, the F-value (12.864) significant at 95 percent level of confidence.

9. Conclusions

Information is among the crucial factor of production, hence, it should be treated equally like human and financial resources of the company. But, Employees' ethos toward information as critical resource is better at the top level than lower level. The company's top level management is not enough committed to enhance the information system in the organization. But to some extent the management of the organization relies on information system to make decisions. Apart to this, there is high correlation between information system and employees' productivity. It enables them to complete their job effectively, to get right information at the right time, to share information, Employees do not have to collect data manually for filing and analysis, reduce error and repetition and helps them to supply quality information to decision makers. Thus, information system has a great role on employees' productivity. The current information system in the organization effects its operation in various ways: for example, it enables the organization to make sound decisions, offer better service to customers, retrieve data efficiently, strong departmental integrations, for having efficient modes of operation and generally enhance organizational efficiency and effectiveness.

Reference

- Baker, R. (1993). "Boom Time on the New Frontier. *Fortune Special Issue, Making High Tech Work for You*, 153.
- Caranana, R. L. (2012). *introduction to management information system*. castello da la plana: universitat Jaume I.
- Coulter, R. S. (2003). *Management, 7th edition*. masachuessette : prentice hall.
- Davies, P. B. (2009). *Business information systems*. New York , : Palgrave Macmillan.
- Everest, G. B. (1976). *introduction to management information system*. New York: McGraw Hill.
- FDRE. (2010). *Growth and transformation plan*. Addis ababa: Ministry of Finance and Economic Development.
- Huber, G. P. (1990). A theory of the effects of advanced information technologies on organizational design,intelligence, and decision making. *Academy of Management Review*, 15(1), 47–71.
- Irani, Z. S. (2001). Transforming failure into success Through organisational learning: An analysis of a manufacturing information system. *European Journal of Information Systems*, 10(1), 55-66.
- John Adams, H. T. (2007). *Research Methods for graduate business and scocial science students*. New Delhi: sage publication inc.
- Kabiru I. Dandago. (2012). Impact of investment in information technology on the return on assets of selected banks in nigeria. *International Journal of Arts and Commerce Vol. 1 No. 5*, 235-236.
- Kehinde O., Yusuf S., (2012). Management Information System as a Catalyst to Organisational Performance in the 21 Century: A Study of Selected Banks in Nigeria. *American Journal of Business and Management Vol. 1, No. 1, 2012.*, 12-17.
- Naresh, M. (2007). *marketing research: an applied approach*. new delhi: prentice hall.

- O'Brien, J. A. (2004). *Management Information System*. London: McGraw Hill I 6.
- Owens, Wilson, Abell. (1995). Information and business performance: a study of information systems and services in high-performing companies. *Information Research, Vol. 1 No. 2*, 8-9.
- Pallant, J. (2010). *SPSS Survival Manual*. 4th edition, McGraw Hill
- Reynolds, R. M. (2012). *Principles of information system 10th, edition*. Boston: Cengage Learning.
- Senn, J. A. (1990). *Information Systems in Management*. Belmont, CA: Wadsworth Publishing.
- Shaukat, M. (2009). Impact of Information Technology on management efficiency: a case study Pakistani firms. *PhD dissertation: Institute of Management Sciences Bahauddin Zakariya University, Multan (Pakistan)*, 27-58.
- Shergill S., Lal, Khan. (2012). Applications of Management Information Systems (MIS) in Decision Making in the private colleges. *GIAN JYOTI E-JOURNAL, Volume 1, Issue 2 (Jan – Mar 2012)*, 1-2.
- Sushil, Argawal. (2003). *The contribution of IT to critical response activities in business transformation, Working paper*. New Delhi: Indian Institute of Technology.
- Tripathi, K. P. (2011). Role of management information system (MIS) in human resource. *International Journal of Computer Science and Technology*, 2 (1), 58–62.
- Todd Dewett, G. R. (2001). The role of information technology in the organization: a review, model, and assessment. *Journal of Management*, 313-346.
- Turban, M. A. (2001). *Information Technology for Management: Transforming Business in the Digital Economy 3rd edition*. London: Prentice Hall.
- Zikmund, W., Babin, B., Carr, J., Griffin, M. (2010). *Business Research Methods*. 8th edition, South Western, Cengage Learning

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