Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.4, No.13, 2013

A Comparative Analysis of Cost and Benefit of using Information Technology in a Corporate Institution

Ben T. Ocra
Malaysian Open University/AIT, P.O. Box SR 373 Spintex Rd, Accra-Ghana
Email: ben.ocra@yahoo.com

Abstract
The purpose of this paper was to make a comparative analysis of cost and benefit of IT use within an organisation. The simple and stratified sampling techniques were used to select a group of 120 IT employees. Data analysis was done using percentage, frequency, the T-test and ANOVA. It was realised that cost areas of the use of information technology within the organisation are hiring of IT staff, training of IT staff, maintenance of equipment, motivation (remuneration) of IT staff, payments for utility bills consumed by IT equipment and royalties. Also, the areas of benefit of IT use within the organisation are easy management communication; increased speed of production; speedy service delivery; improved avenues of marketing and sales; improved access to customers and prospective customers; enhances market share; and promotes organisational productivity.
Keywords: Information technology, application, sectors, benefit, cost

Introduction

The flexible nature of Information Technology has facilitated its employment in most sectors of industry (Awal, 2010). Information Technology (IT) has become a global tool for the nurturing and development of businesses and non-profit organisations (Sewornuku, 2011). Thus, the sectors of banking, insurance, manufacturing, telecommunication, public administration and the like, have become popular fields in which Information Technology is used. The use of Information Technology has helped businesses to develop and package products, create desired services, attain expected service and product quality levels and to market such products and services satisfactorily (Kelly, 2003). This practically works out the growth of businesses. Regardless of how beneficial its use may be, however, Information Technology application in an organisation may bring about financial challenges (Kelly, 2008). In view of this, Mohammed and Sulley (2009) said the use of Information Technology may make negative or positive financial impact on the organisation, depending on how the organisation applies Information Technology. There is an upward trend of use of Information Technology in Ghana (Serwornuku, 2011). For instance, the sectors of banking, insurance, telecommunication and manufacturing in Ghana have been noted for the use of Information Technology in management communication and marketing of brands (Tawiah and Adjei, 2001).The use of Automated Teller Machines (ATMs) by banks, the adoption of Mobile Banking Systems by telecommunication service providers and the advertising of brands on the internet by manufacturing firms are typical examples of the way Information Technology is being explored in Ghana. There is however the difficulty of measuring the financial impact of use of Information Technology in Ghanaian corporations (George Andah, Personal Communication, November 14, 2012). Thus, managements of organisations in Ghana have not been unable to identify the net financial outcome of the costs and benefits of Information Technology use. The study therefore sought to identify the way to measure the costs and benefits of the use of Information Technology, as well as its net financial result.

Statement of the problem

Organisations in Ghana cannot tell whether the use of Information Technology (IT) is contributing to financial growth or otherwise (George Andah, Personal Communication, November 14 2012). This is based on the fact that managements of organisations in Ghana are unable to measure the financial costs and gains of the use of information technology. Ghanaian corporations lack the consciousness and ability to appropriately estimate the costs and benefits involved in the various ways of using IT and the resulting net outcome (Antoah, 2008). As a result, the managements of many organisations in Ghana have been misled by wrong estimates of growth. Thus, there have been instances when annual reports of organisations in Ghana indicated growth while it was actually not the case, and this was caused by underestimating costs of IT use within the organisations. The study was therefore to reveal how to measure the financial impact of the use of IT in Ghanaian corporations.

Objective of the study

The objective of the paper was to make a comparative analysis of the cost and benefit of using Information Technology in corporate institutions in Ghana. The specific objectives were:

1. To identify costs of using information technology
2. To identify benefits of using information technology

3. To identify how to estimate the net effect of the cost and benefit of IT use

Hypotheses of the study

Null hypothesis 1: There is no difference between the values of the cost and benefit of using Information Technology.

Alternative hypothesis 1: There is a significant difference between the values of the cost and benefit of using Information Technology.

Null hypothesis 2: There is no difference between the values of the cost of using IT in the various sectors of industry.

Alternative hypothesis 2: There is a significant difference between the values of the cost of using Information Technology in the various sectors of industry.

Null hypothesis 3: There is no difference between the values of the benefit of using IT in the various sectors of industry.

Alternative hypothesis 3: There is a significant difference between the values of the benefit of using Information Technology in the various sectors of industry.

Literature Review

Information Technology (IT) has become a global tool for the nurturing and development of businesses and non-profit organisations (Sewornuku, 2011). Thus, the sectors of banking, insurance, manufacturing, telecommunication, public administration and the like, have become popular fields in which Information Technology is used. The use of Information Technology has helped businesses to develop and package products, create desired services, attain expected service and product quality levels and to market such products and services satisfactorily (Kelly, 2003).

Information technology (IT) involves the application of computers and telecommunications devices and tools to store, retrieve, transmit and manipulate data (Alavudeen and Venkateshwaran, 2010; Daintith, 2009). The term is commonly used as a related word for computers and computer networks, but it also encompasses other information distribution technologies such as television and telephones (Chandler and Munday, 2005). In addition, many sectors are associated with information technology, such as computer hardware, software, electronics, semiconductors, internet, telecom equipment, e-commerce and computer services. Contextually, the Information Technology is defined by Ellen and Morton (1994) as the study, design, development, application, implementation, support and/or management of computer-based information systems towards decision making. The business value of the use of information technology is to automate business processes, provide information for decision making, connect business with their customers, and provide productivity tools to increase efficiency. Business managements and administrations are characterised of the application of IT such as electronic communication, internet usage, graphic design and usage, databases management, data mining, basic computer skills, website creation, data analysis and the like (Butler, Ryan and Chao, 2005). Baffoe (2009) stresses the needfulness of information technological devices in the development of a corporation, in which emphasis is laid on making the most economic use of information technology. Koomey (2012) said information technology is an indispensable tool needed for growing businesses through effective decision making. Moreover, the organisation has the opportunity to use information technology in a manner that its benefit of application would outweigh its cost.

Undeniably, the global economic downturn has brought financial suffocation to many businesses, and the situation coexists with cost hikes for organisational logistics (Reinhart, and Rogoff, 2009); a reason for which there is the need for the most economic use of information technology equipment within the organisation (Baffoe, 2009). DePamphilis (2009) is of the view that the fall of many businesses in recent times is attributed to mistaken acquisition of materials and logistics within the organisation. In fact, investing unwisely in acquiring and using information technology can be fatal to the organisation. So notwithstanding its usefulness to the organisation, IT-based investment can ruin the growth or progress of an organisation. This requires that organisations acquire knowledge of the cost and benefit of using information technology for business growth.

Benefit of Information Technology use in various Sectors

Communication technology is one of the most important facilities of information technology (IT) in the world. It has improved businesses and society by making it easier to communicate between people and organisations. An organisation has many benefits or advantages and many barriers by using information technology. One of the advantages is that internet can help companies to communicating effectively with clients (Caplan, 2006). Corporations can also use it to build a good relationship with their customers and stakeholders. In recent times, most companies provide a website to market their goods and give more detailed about company's business. Moreover, many companies now use a virtual communication, an element of IT, to deal or exchange information. IT helps a business to deal and advertise their products. Researches show that companies which use the internet develop faster than others (Dibben, 2009). In addition, many clients use internet to read about products and

services of organisations. According to Vallee (2002, p. 109): 'the whole world has access to your products, in proportion to the access people have individually to the internet'. The internet is very useful for companies and helps them to communicate with their clients. Central to the argument is the idea that the use of IT establishes and relishes effective communication within the organisation, which contributes to the organisation's financial growth. In such management communication processes, computers, mobile phones, i-pads and other electronic gadgets are widely used. The benefit of using these devices is influenced by their management by the IT department of the organisation and the rest of staff members and how management analyses the cost and benefit of their use. Meanwhile, the usefulness of information technology to the organisation is summarised into:

- Easy management communication, which is brought about by the use of the internet and other platforms of communication through mobile phones, computers, i-pads and the like (Harwell, 2003; Baffoe, 2009).
- Increased production speed, which is facilitated by the use of special machines and equipment to undergo industrial production. In most cases, what the organisation sells depends on what information technology helps it to produce (Harwell, 2003).
- Increased service delivery speed; an area where banks, insurance companies and other service-based firms have benefited from (Baffoe, 2009). In fact, the speed of banking and financial transactions can be increased by the use of internet in conjunction with mobile phones and i-pads.
- Improved avenue of sales and marketing, where the internet, electronic billboards, pull-ups and others are applied in advertising and promotions (Harwell, 2003; Baffoe, 2009). Factually, such items as mobile phones, i-pads and their integration systems can be used in market communication processes.
- Improved access to customers and prospective customers. Access to customers is facilitated by information technology (Harwell, 2003; Baffoe, 2009). Internet and mobile phone alerts and Automated Teller Machines (ATMs) are examples.
- Enhanced productivity brought about by application of gadgets and machines in production (Harwell, 2003; Baffoe, 2009). Applying electronic equipment in production brings end-products closer to expectations and makes them finer and appealing.
- Improved market share, which is heralded by a situation of effective marketing and product service designs (Baffoe, 2009). Effective marketing coupled with a suitable development and packaging of products to meet customer preference generates and sustains desired market share. As discussed earlier, marketing and product and service packaging are better undertaken with IT devices.

Cost of Information Technology use

Running an organisation would always come with cost. Cost of running an organisation often touches on investment on people and logistics, where its success depends on how reasonable money is spent on hiring and training and purchasing materials and equipment (Baffoe, 2009). Investment on materials and equipment would involve purchase information technology devices, and this may even extend to hiring people who can use and manage such devices (Koomey, 2012). Simply, the use of information technology always comes with cost. Moreover, the cost of using IT is faceted into many areas as follows:

- Equipment purchase: Koomey (2012) said that the cost of IT use in the organisation touches the purchase of equipment, which may include computers, phones, i-pads, printers and other similar devices. It is however important for organisations to gear purchase and use of such equipment to organisational growth. This is to avoid situations where employees become unnecessarily obsessed with their use. Employees could also use such devices unwisely and for personal gains, a situation that can thwart the usefulness of IT devices.
- Staff hiring: Hiring of staff or skilled workers is part and parcel of the processes of organisational management (Blattera, Muehlemanna and Schenkera, 2012). Of all the people hired, there are some who are obligated to management or use devices of information technology. The cost involved in doing this depends on the type of role involved and the academic credentials and experience of the employee. A more economical way of hiring is to ensure that the one who has been hired is able to work to generate revenues that exceed his or her remuneration (Blattera, Muehlemanna and Schenkera, 2012). Additionally, the cost of hiring IT workers mostly includes their training and motivation, processes that must be well executed to contribute to the financial growth of the organisation.
- Equipment maintenance (Koomey (2012): Regardless of the size and financial ability of an organisation, breakdown of machines is irrevocable. This means that the need to maintain equipment or machine will often rise. Yet, the organisation must be able to develop an eye of compromise between maintenance and complete replacement of equipment (Koomey (2012). In this way, the organisation would be able to identify economically feasible ways of bringing back equipment into action through maintenance.
- Bills and royalties could be paid on IT devices and equipment. An example is electric power consumption, which is often very high for organisations. I greater part of these bills come from the use

of computers and other IT devices in the organisation (Koomey, 2012). It is highly relevant for the organisation to ensure that the use of these devices is restricted to the needs of the organisation to avoid accumulating excessive bills.

Measuring the Impact of Information Technology Use

The approach to measuring the impact of use of Information Technology is a normal arithmetic (Antoah, 2008). It is simply the difference between the values of the financial cost and benefits of using Information Technology. A general challenge, however, is how the benefits of using IT are estimated (Baffoe, 2009). Whiles it is quite easy to estimate costs of using IT, it is not that easy to value the financial benefits of doing so (Baffoe, 2009). In a general way, the financial impact of using IT is given by the formula F = C-B, where F is the net value of the cost and benefit of using IT; C is the value of the cost of using IT and B is the value of the benefits of using IT (Antoah, 2008). This means that the financial impact of using Information Technology equals the net value of the cost and benefits of using Information Technology.

METHODOLOGY

This section comprises of a discussion of the study's most appropriate research designs, population, sample and sampling techniques and tools of data analysis.

Research Design

The appropriate research designs adopted were the case study and quantitative research. Thus, the research is partly a case study of the service sector of Ghana. I made this option to be able to concentrate on the research problem in the service sector, enabling me to find recommendations that would be perfectly suitable for improving the cost-benefit conditions of using I.T. in the sector. The rapid rise in the demand of I.T. use in the Ghanaian service sector in modern times compelled me to use it for the case study. The study is also a quantitative research, as it would involve the test of hypotheses and the use of descriptive statistics in presenting some results.

Population

The population of the research was employees of corporate organisations in Ghana. The target population was senior staff members in the I.T. department of the organisations. These organisations are Scancom (Gh) Limited, SIC Insurance Company, Barclays Bank Ghana Limited, Bureau of Market and Social Research and Ghana Statistical Service. The above-mentioned organisations were chosen as a result of their frequent and high use of I.T. in service delivery. They are also suitable sources of data, considering their locations and administrative orientation.

Sample and Sampling Technique

The convenient sampling technique was used in the study. Convenience sampling was used in the selection of respondents, who were all from the I.T. departments of the corporations. Respondents were also the most knowledgeable senior staff members of the various I.T. departments. These respondents were chosen owing to the fact that they had accurate knowledge about the trend of use of I.T. in the corporations, including the cost and benefits of using I.T. in recent times. From each corporation, the best 10 I.T. experts were chosen with assistance from the respective human resources departments. There was a sample size of 120 in all

Tools of Data Analysis

The SPSS was used to analyse data. Descriptive statistical tools, precisely frequencies, percentages and averages were used in presenting results. Hypotheses were tested using the two-sample T test and ANOVA (Analysis of Variance).

RESULTS OF THE STUDY

Table 1 below gives the various cost elements of organisational IT application. About 19% of respondents indicated purchase of equipment. About 18% of respondents said a cost area is hiring of IT staff, while about 10% indicated training of IT staff. About 20% of respondents attributed cost to maintenance of equipment. Additionally, about 18% said that a cost element comes from the motivation (remuneration) of IT staff. About 8% of respondents indicated cost of paying utility bills consumed by IT equipment and their royalties. About 7% of respondents indicated that there are other costs elements of IT application within the organisation.

Cost element	Frequency	Percent (%)
Equipment purchase	23	19.17
Staff hiring	21	17.50
Staff training	12	10.00
Equipment maintenance	24	20.00
Staff motivation	22	18.33
Bills and royalties	10	8.33
Other cost elements	8	6.67
Total	120	100.00

Table 1. Cost Elements of Organisational IT use

Table 2, on the other hand, indicates the benefit areas of organisational IT application. About 9% of respondents indicated that IT application brings about easy management communication. Also, about 11% of respondents said that there is often an increased speed of production in the face of IT application. About 14% of respondents indicated that application of IT enhances speed of service delivery. About 18% of respondents indicated that there are improved avenues of marketing and sales when IT is employed. About 13% of respondents also indicated that there is improved access to customers and prospective customers when IT is used. About 8% of respondents were of the view that IT use at the organisational level enhances market share, and about 12% indicated that IT application generally promotes organisational productivity.

Benefit areas	Frequency	Percent (%)
Easy management communication	11	9.17
Increased production speed	13	10.83
Increased service delivery speed	17	14.17
Improved avenue of sales and marketing	21	17.50
Improved access to customers and prospective customers	15	12.50
Improved market share	9	7.50
Enhanced productivity	14	11.67
Total	100	83.33

Table 2. Benefit Areas of Organisational IT use

Table 3 below shows values of α and p associated with a two-sample T test for a difference between the values of cost and benefit of IT use within the organisation. The statistics ($\alpha = 0.05$, $p = 0.09$) requires a rejection of the hypothesis. The conclusion is that there is a significant difference between the values of the cost and benefit of IT use within the organisation. The mean values of the cost and benefit are 1.97 and 3.99 respectively. This indicates that the value of the benefit is higher than that of the cost. This means generally that the value of the benefits of IT use within the organisation is higher than the value of the cost of its use.

Hypothesis	α	*p*	Decision	Conclusion
There is no difference between the values of the cost and benefit of using IT	0.05	0.09	Rejected	There is a significant difference between the values of the cost and benefit of using IT

Table 3. Values of *p* and α Associated with a Two-sample T-test

Table 4 below shows the F and p statistics associated with the test of two hypotheses. For the first hypothesis, the F and p values are respectively 0.11 and 0.99. These statistics require a rejection of the null hypothesis. The conclusion in this case is that there is a significant difference between the values of the cost of using IT in the various sectors of industry. The statistics associated with the second hypothesis are ($F = 0.23$, $p = 0.95$). These statistics also require a rejection of the null hypothesis. The conclusion in this case too is that there is a significant difference between the values of the benefit of using IT in the various sectors of industry.

Hypothesis	*F*	*p*	Decision	Conclusion
There is no difference between the values of the cost of using IT in the various sectors of industry	0.11	0.99	Rejected	There is a significant difference between the values of the cost of using IT in the various sectors of industry
There is no difference between the values of the benefit of using IT in the various sectors of industry	0.23	0.95	Rejected	There is a significant difference between the values of the benefit of using IT in the various sectors of industry

Table 4. Results of ANOVA Test

Conclusions and Recommendations

The cost areas of the use of information technology within the organisation are hiring of IT staff, training of IT staff, maintenance of equipment, motivation (remuneration) of IT staff, payments for utility bills consumed by IT equipment and royalties. In agreement with the discoveries of Harwell, (2003) and Baffoe (2009), the areas of benefit of IT use within the organisation are: (1) easy management communication; (2) increased speed of production; (3) speedy service delivery; (4) improved avenues of marketing and sales; (5) improved access to customers and prospective customers; (6) enhances market share; and (7) promotes organisational productivity. Furthermore, there is a significant difference between the values of the cost and benefit of using IT. Additionally, the benefit of using information technology within the organisation is higher than the cost. Also, there is a significant difference between the values of the benefit of using IT in the various sectors of industry. This means that the benefit of using information technology in the various sectors of industry in Ghana is the same. Last but not least, there is a significant difference between the values of the cost of using IT in the various sectors of industry

The usefulness of information technology application an organisation can be measured by finding a difference between values of cost and benefits of IT use (Antoah, 2008). Unlike the cost of using information technology, there is a major challenge with the valuation of benefits of using IT. It is recommended that valuation of benefits is done in terms of organisational turnover. Managements, based on their experience and scale and scope of information technology application, could ascribe a proportion of organisational turnover to the use of information technology.

References

Antoah, K. (2008). Estimating the cost of information technology use: A review of management policies, Ghana Research International, Accra Ghana, p. 37.

Alavudeen, H. and Venkateshwaran, T. (2010). Industrial application of Information Technology, *Journal of Business Management*; 4 (33): 23-29.

Awal, G. (2010). The contribution of information technology to employment and economic growth, Masters Dissertation, University of Alberta, Alberta, Canada, pp. 34-39.

Baffoe, E. F. (2009). Use and benefits of Information Technology in business, *Management Information Systems Journal*; 5 (21): 77-78.

Blattera, K., Muehlemanna, Y., Schenkera, H.Y. (2012). Hiring IT employees: A management challenge, *International Journal of Human Resource Management*; 3: 345-353.

Butler, T., Ryan P., and Chao, T. (2005). Gender and technology in the Liberal Arts: Aptitudes, attitudes, and skills acquisition. Retrieved http://www.jite.org/documents/Vol4/v4p347-362Butler80.pdf on 23/11/2012 at 9:02 AM.

Caplan, M. (2006). Technology-based Communication, *Importance and Value*, Morgan and Morgan Publishers, Durban, South Africa, p. 106.

Chandler, D.; Munday, R. (2003). Information technology, A Dictionary of Media and Communication (first ed.), Oxford University Press.

Daintith, J. ed. (2009). IT, A Dictionary of Physics, Oxford University Press, United Kingdom, p. 34.

DePamphilis M. G. (2009). The failing of many businesses: A technological problem, *Management Information Systems Journal*; 8 (42): 56-70.

Dibben, V. (2009). The internet and marketing: A competitive tool, *Journal of Marketing*; 7, 81-90.

Ellen, K. and Morton, R. (1994). The concept of information technology, *Definition of information technology*, Global Link Publications, New Jersey, United States, p. 67.

Harwell, K. L. (2003). Information technology today: The benefits of information technology use, Management Report Review, pp. 41-48

Kelly, F. R. (2008). The use of IT in product design and packaging: A case study of Unilever, *Business and Economic Review*; 6 (23): 78-98.

Koomey, K. (2012). Information Technology and decision making in business: An analytical viewpoint, *Journal of Entrepreneurship*; 3 (41): 43-50.

Mohammed, S. and Sulley, K. (2009). The financial effects of information technology use: A case study of Ghana Telecom Company, Ghana Institute of Management and Public Administration, Accra Ghana, pp. 44-49.

Sewornuku, D. (2011). Information technology for organizational growth, *Management Information Journal*; 3 (54): 28-32.

Tawiah, D, and Adjei, S. (2001). Information technology for product and service packaging and marketing, International Marketing Journal; 4 (55): 23-34.

Vallee, D. (2002). The internet: A medium for product promotion and sales, Providence publications, Liverpool, United Kingdom, p. 109.