Investigation into How Managers Justify Investments in IT Infrastructure

Dr. Richmond I. Ibe, Information Systems Management Consultant
Dallas, Texas USA, Email: richyryke@yahoo.com

Bibliography

Dr. Ibe graduated from Walden University with a PhD in Management information systems, in 2012. He currently consults in the field of IT management. Dr. Ibe worked at Nigerian National Petroleum Cooperation (NNPC) from (1998-1999) in the R&D department as a technical Analyst. He also worked at Lacosta Nigerian Limited from (1999-2002) as a resident Architect. From (2003-2006), he worked at Services Electronics/Gateway Computer Incorporated in Dallas Texas as an IT project lead in PC repairs and assembling. After graduating in 2006, with Masters in Business Administration (MBA) at University of Phoenix, he was rehired to manage IT projects for Teleplan. Dr. Ibe currently worked at Ryke Development Consult in Dallas Texas as a management consultant. He also serves as alumni mentor at University of Phoenix where he thought students research and information systems management in business. Dr. Ibe’s dissertation was on the “investigation into how managers justify investments in IT infrastructure.” He belonged to several professional organizations such as Project management Institute (PMI), Information Systems Auditors and Control association (ISACA), and American Management Association. He has a passion on application of technology, and infrastructure development more especially in rural African communities. Dr. Ibe currently is researching on The Role of Information Communication Technology on mitigating flood Risks in Niger-Delta- Nigeria.

Abstract

Organization leaders are dependent on information technology for corporate productivity; however, senior managers have expressed concerns about insufficient benefits from information technology investments. The problem researched was to understand how midsized businesses justify investments in information technology infrastructure. The purpose of this study was to investigate the business factors or approaches leaders of midsize businesses use to justify these investments. A qualitative case study approach was used for this exploration, with a combination of individual interviews and a small focus group. Research questions asked about types of investments as well as justifications of these investments. The conceptual support for the study was organization performance theory. Data were collected using a self-designed questionnaire and from a small focus group session, which were coded and analyzed for themes and patterns related to investments and justification. Findings were that managers justify investments in information technology infrastructure based on intangible benefits, including efficiency, customer services, high productivity, and gaining competitive advantage. This research can be adopted for complex initiatives within levels of organizations such as economic development planning, leadership programs, government projects, environmental development, and infrastructure investment projects. Implications of positive social change include increased productivity and revenue, improved efficiency, employee satisfaction, and cost savings to the organizations.

Keywords: Investments in IT, Justification of IT, Management, IT infrastructure, and IT benefits

Chapter 1: Introduction to the Study

The focus of this study was to investigate how managers justify investments in information technology (IT) infrastructure. According to Accenture (2009), 72% of business executives in IT organizations in the United States expect to increase their investments in IT infrastructure, yet it was not clear what justification approach they used. Symons (2008) examined justifications for IT...
infrastructure investment and funding, noting that investments in IT infrastructure infrequently connected directly to a business strategy objective, which makes it difficult to determine business value. In this study, I explored the justifications for investments in IT infrastructure. This chapter covers the background of the study, statement of the problem, purpose of the study, nature of the study, theoretical or conceptual support for the study, definition of terms, scope and delimitations, limitations, research questions, and significance of the study.

Background of the Study

Several researchers have been written about the justification of investment in IT infrastructure, but researchers have not yet addressed the issue of organizations leveraging resources through IT and at the same time making a profit from their investments in IT infrastructure. Dekleva (2005) researched this problem using a quantitative approach (valuation technique) to determine if there could be any justification for investments in IT infrastructure. In this study, I used a qualitative case study approach, which involved in-depth data collection with multiple sources of information within IT organizations. Organizations are dependent on IT, but executives are concerned about the justification of investments in IT infrastructure. According to Accenture’s (2009) global survey on investment in IT infrastructure among business and IT executives, 72% stated that their organizational leaders placed greater value on the current IT function than they did prior to the current economic crisis. Executives view IT as an important part of their economic recovery efforts, based on the findings of a global study released by Accenture (2009) and produced in cooperation with the Economist Intelligence Unit (EIU). From the report, executives’ perceptions in their various organizations indicated that technology spending may increase, either selectively (47%) or collectively (10%) in the next 12 months. Further, non-IT executives appeared to expect a greater increase in IT spending than those directly involved in IT, as 61% anticipated technology spending boosts (Accenture, 2009). Surveys conducted in the United States showed that the executives indicated the need to invest in technology.

The majority (81%) of executives worldwide stated they experienced increasing demands to implement projects that include more flexibility than expected previously (Vujanic & Unkefer, 2009). In the United States, 87% of participants agreed. In a survey conducted in the United States, more than 550 executives indicated that cost savings and control are essential drivers in IT investment decisions. The participants stated there are three measures most effective in decreasing the cost of implementing IT projects: ensuring the firmness and importance of business needs of a project, the change or justification of the current systems, and shift to open platforms (Vujanic & Unkefer, 2009). Alternatively, managers perceived that the future focus should be shifted from short-run product strategies to long-run strategies of intellectual capital such as human capital, organizational capital, and relational capital in knowledge transfer (Chen, Shih, & Yang, 2009). Ambrose (2002), Zhang and Fung (2006), and other researchers discussed the relationships between intellectual capital factors. A few researchers discussed the justification of investments in IT infrastructure such as Dekleva (2005) and Symons (2008), noting the lack of significant data for evidence. The benefits realized by investing in IT infrastructure are hard to describe. As a result, tools used to measure future benefits for the organization becomes more difficult. Additionally, Symons (2008) asserted that several organizations were less concerned about using financial tools for analysis; rather, they funded infrastructural investment on faith without a business case.

This study considered different approaches to understand why few midsized businesses have a formal process in place to justify investments in IT infrastructure. Exploration of this case could lead to the discovery of alternative approaches to justify investments in IT infrastructure. Melville, Kraemer, and Gurbaxani (2004) used an integrative model of IT business value to determine if there were justifications for IT investments in infrastructure. This situation appeared to be a problem because the perception was that leaders of most IT companies have overlooked the importance of using alternative approach that incorporate IT intangibles for their investment justification.

Managers have used various traditional accounting techniques to calculate financial return on IT infrastructural investments (ROI), including present value (PV), net present value (NPV), and
internal rate of return. According to Dekleva (2005), organizational leaders have started considering nonfinancial measures such as better and faster product design, improved customer service, increased employee effectiveness, and increased brand value and reputation. In addition, practitioners in finance and accounting considered that every investment should be based on verifiable ROI calculations. Further, Dekleva noted that not every calculation of ROI may be based on accounting perspectives only. Some intangible benefits exist that cannot be quantified easily. For example, Dekleva stated that questions exist about the worth of investing in a firewall to prove that such decisions cannot be based on traditional ROI figures. Dekleva also identified alternative approaches and made suggestions when those approaches may be more appropriate. In justifying whether ROI should always be used for IT investment decision making, Dekleva (2005) discussed a study of 130 senior executives from companies that averaged $230 million in annual IT spending. The faculty members at Kellogg School of Management at Northwestern University in conjunction with members at the Society for Information Management and the Diamond Cluster International Consulting firm conducted the study. The researchers noted that 51% of participants have no process to evaluate IT investments within their business strategy. Approximately 68% of the participants lacked the strategy of comparing their IT projects’ benefits to original targets (Dekleva, 2005). Between October 1999 and March 2000, in three out of the 30 companies studied, executives invested in at least one e-business initiative without a business case (Dekleva, 2005). According to Symons (2008) a survey conducted by Forrester reflected that 32% of the respondents do not use standard business case, and 63% do not conduct a post implementation benefits matrix on investments in IT infrastructure. Senior managers’ initiatives perceived as strategic were mainly to allocate funds for financing the e-business project, and executives from 16 companies invested widely in their companies’ infrastructure.

Accenture’s (2009) studies indicated that nonquantifiable benefits always have been a concern in constructing investment proposals; executives hesitantly suggested that nonquantifiable benefits have to be translated into monetary value. The executives resolved the translation problem by expecting that the relevant business functions can secure the benefits from the planned use of the new IT services. These business functions will ultimately need to be used to finance the projects to provide the IT services from which organizations expect to benefit. Examples of intangible benefits included customer services, increased safety, increased efficiency, decreases operational error, and a focus on public health matters. The benefits are considered good but difficult to quantify.

Statement of the Problem

The problem researched was to understand how mid-sized businesses justify investments in IT infrastructure. With the dynamic nature of business, justifying investments in IT infrastructure appears to be difficult. The major problem in justifying investments in IT infrastructure was that little research has been conducted in this area and little was known. According to Wessels (2003), leaders of organizations adopted the same formal process in justifying investments in IT infrastructure, and the tools used by accountant or managers to calculate costs and benefits are not well understood. In addition, organizations do not always perform evaluations or cost-benefit analyses and sometimes report mixed or confused result. The intangible benefits of investments in IT infrastructure make the justification complex and difficult to achieve. Tangible benefits are those benefits that can be quantified and assigned monetary value, while intangible benefits cannot be quantified and assigned monetary value such as customer services (Wessels, 2003). Several studies conducted on investments in IT infrastructure sought to understand if there could be any acceptable model for justification of IT investment. Remenyi et al. (as cited in Wessels, 2003) researched several models and approaches in an attempt to discover an acceptable model that takes many factors into consideration. However, no single method has been universally accepted, and it is the responsibility of the decision maker to choose an approach. Further, the formal method and combination of methods are constrained by the limit of numerical representation and modeling of human reasoning. The process of IT investment, according to Bannister and Renenyeni (as cited in Wessels, 2003), in other areas of the organization are made based on the same formal process in place.
Currently, most new processes, activities, and products introduced by executives require investments in IT infrastructure for full implementation. Business leaders often have to make large investments in IT infrastructure. In addition, spending decisions in IT infrastructure and new applications have become more complex. In measuring the benefits of investments in IT, leaders of many companies have spent significant time and money implementing sophisticated IT systems with the same formal process of IT investment justification. In many organizations, decision makers overlooked economic judgments in justifying expenditures and instead acquired the best and most recent technologies to overtake others, regardless of the results achieved. More than two-thirds of chief information officers (CIOs) reported in a recent survey that they had no process in place for justifying the investment of their IT projects (Appel et al., 2005).

Purpose of the Study

The purpose of this qualitative case study was to investigate the business factors or approaches leaders of midsize businesses use to justify investments in IT infrastructure. Previous research on this topic has shown that a general approach such as ROI adopted by leaders of organizations as a standard model used to justify investments in IT infrastructure does not translate the nonfinancial benefits into financial metrics (Dekleva, 2005). Therefore, this study sought to explain the processes leaders of the organization adopt to justify investments in IT infrastructure. The qualitative case study helped to explore the approach used to justify investments in IT infrastructures such as data backup/recovery, firewalls, business processes, and organizational learning that represent important assets to the organization. However, they may not be readily quantified in monetary value and as such appeared not to be justifiable. The importance of the research was to create an awareness on spending decisions made by IT organizations and to explore how managers justify investments in IT infrastructure. The population was managers from three IT companies.

Nature of the Study

One reason for selecting a qualitative case study was that a qualitative study gives a better understanding than other methods and designs of participants’ experiences. Additionally, a qualitative case study describes fully the phenomenon, which was an important consideration not only from my viewpoint as the researcher but also from the readers’ perspectives. I selected a qualitative case study because this approach allowed the exploration of the behavior of managers regarding IT investment. The case study approach helped to identify cases with boundaries and provide an in-depth understanding of cases (Creswell, 2007). I conducted a pilot study to validate the interview questions before the data collection for the research study began.

Research Questions

I used two central research questions, functionally decomposed into a set of 10 interview questions, in this study. Interview Questions 1 to 6 were derived from Research Question (RQ1), and Interview Questions 7 to 10 were derived from Research Question 2 (RQ2).

RQ1: How do organizational leaders justify investments in IT infrastructure?
RQ2: How do investments in IT infrastructure produce the desired results in organizations?

Conceptual Framework

The conceptual support for the study was organization performance theory. Murphy et al. (1996) indicated that within organization theory, three fundamental theoretical approaches have been developed to measure organizational effectiveness. Murphy et al. indicated that a goal-based approach can be used to evaluate an organization by the goals that leaders set for the organization. However,
organizational leaders have varied and sometimes contradictory goals, making cross firm comparisons difficult. Murphy et al. (1996) believed that organizations are of different forms, and based on the form, the organizational leaders could behave in certain ways, causing researchers often to focus their study sample in a particular industry to control the differences regarding firm effectiveness and profitability.

The *multiple constituency approach* factors in these differences in perspectives and examines the extent to which the agenda of various stakeholders groups are satisfied (Connolly, Conlon, & Deutsch, 1980; Pennings & Goodman, 1977; Pfeffer & Salancik, 1978; Thompson, 1967). Venkatraman and Ramanujam (1986) discussed organizational performance measurement in terms of three hierarchical constructs (i.e., organizational effectiveness, operational performance, and financial performance) and argued that three organizational theoretical perspectives reflect the writings on organizational effectiveness constructs. For this study, the focus was on how managers justify IT investment for infrastructure within the organization.

A second theory that I used to support the study was the *complementary asset* theory in which proponents stressed that IT is an important component of corporate competitive advantage but that corporate competitive advantage cannot only rely on IT. Further, if depending on IT only, organizations cannot maintain competitive advantage for long (Carr, 2003). In addition, corporate information systems should develop a niche to gain competitive advantage. According to Carr (2003), organizational leaders need to consider the concept of balance and consider the risks of using IT from a practical viewpoint rather than only considering the benefits provided. One risk involves overspending. The implementation of IT upgrades is required in nearly every application, regardless of the complexity, and often company leaders are careless in using IT resources.

According to Mahapatra (2011), the economic value-added (EVA) framework is an approach developed to justify IT investment or used to calculate an investor’s value in a company. EVA evaluates the significant change between the return on a firm’s cost of capital and capital. EVA appears to be a suitable method to discover the value of operations in relation to other methods like accounting profit. Additionally, Mahapatra stated that the management appeared to view more value in IT investment if EVA was use as a performance appraisal of cost evaluation and the IT function does not require repeated justification on its existence and investment. Investments in IT infrastructure appear to enhance organizational effectiveness, but how managers justify the investment was the focus of this research study. Regardless of the positive experiences and case reports, some important questions had not yet been answered. Even the most critical question has not been completely and indisputably answered. The justification of IT infrastructure investment has become an issue; Mingay, Furlonger, and Magee (1998) stated that clients are not happy with the information systems organization because of their lack of solutions, and high cost of deploying IT infrastructure.

The framework for this study also used the balanced scorecard model, which has four interactive modules. These modules include: Finance, Customer, Learning and Growth, and Business Processes (Kaplan & Norton, 1996). The framework was a possible view of a required infrastructure investment, from the perspective of customer need or demand. Replacing customer need with government compliance or top management mandate would provide related views of the model. A financial measure was used to quantify IT investment for infrastructure as not everything can be measured in dollars by using the traditional method of ROI. The customer’s need and business process are intangibles that cannot be measured using the accounting method of ROI. For example, data backup/recovery, firewalls, business processes, and organizational learning are important assets to the organization. However, they cannot be quantified in monetary values, and as such may appear not to be justifiable. In addition, some estimates are possible to provide a dollar number for those executives who require one. For example, Epstein (2008) noted one concept that could be of value in estimating value: management’s willingness to pay. Estimates of what managers are willing to pay are possible to obtain through conversation, interviews, focus groups, and so on. The main focus of this framework was to show the connection of these IT investments for infrastructure and to see if there could be any method of calculation to justify investment for infrastructure.
Limitations

The study was limited to a city in the United States, three midsized companies, a few managers and staff, and a limited sample. The findings in this study could not be generalized because the three midsized companies were purposefully selected. The success or failure on how managers justify investments in IT infrastructure depended on information gathered from the participants through the questionnaires.

Significance of the Study

The significance of the study to IT business is that it could lead to positive social changes, which include helping the organization to prioritize and determine the investment structure within their organizations. The application of this research could also help the organization to increase revenue, which will improve organizational performance. In addition, businesses interested in a new method of planning, evaluation, and monitoring can also benefit from this study. Further, this research can provide guidance for complicated initiatives within levels of organizations, economic development planning, leadership programs, environmental development, and infrastructure investment projects.

Instrumentation and Material

The instrument that was used for data collection was a self-designed questionnaire composed of 10 interview questions. These questions were divided into two groups based on the main research questions, designated as RQ1, and RQ2. The set RQ1 included interview questions ranging from 1 to 6 and RQ2 ranging from 7 to 10. These questions were segmented because RQ1 questions looked at how managers justify investments in IT infrastructure, and RQ2 questions looked at the benefit side of the investments in IT infrastructure. The three companies noted as A, B, and C used the same questionnaire for the data collection except that company C was designed for the focus group discussions. I used the Qualtrics survey tool to distribute the questionnaire to Company A and B respectively. The Qualtrics survey tool is an analytical software program that collects and organizes survey data. The focus group session involved five participants. Within this group, one person was the moderator, and another person was the note taker, and the other participants discussed extensively their experiences on how managers justified investments in IT infrastructure in their various organizations. Self-designed Matrix form was used for the focus groups to collect the data. The focus group session lasted for 20 to 30 minutes. The same questions that applied to A and B were presented by the moderator, who was exempted from answering. The discussion was designed in a manner that all the participants answered the questions except the moderator and the note taker.

Reliability and Validity

To ensure reliability and validity, a pilot study was conducted to validate the interview questions before the data for the research study began. Additionally, this was to ensure that the consistency with which the questionnaire was answered remained relatively the same. The pilot study was conducted through an electronic interview with two participants selected to validate the questionnaire.

Interpretation of Findings

The findings showed that managers justify investments in IT infrastructure based on intangible benefits realized from IT. Each of these interview questions produced five different views on how organizations justify investments in IT infrastructure. Themes were formed based on the responses from the interviews. There were four different themes found from interview responses that linked to research question 1. According to the results obtained from the interviews, managers appear to be
motivated to invest in IT infrastructure because of the intangible benefits. The first theme looked at ROI as the process used to justify investments in IT infrastructure. The data collected from the midsized companies partially agreed that ROI approach was appropriate as the process to justify investments in IT infrastructure. With referenced to the interview data collected from these midsize companies, only 33.3% of the participants agreed that ROI model was adequate for the justification. Alternatively, only 6.6% of the participants agreed on the use of ROI model rather indicated a different approach to justify investments in IT infrastructure. In fact, the data collected from the focus group noted that managers should be flexible in the use of models or approaches to justify investments in IT infrastructure. The study shows that 40% of the participants revealed that cost model was adequate for use to justifying investment in IT infrastructure. The theme as studied had mixed perspectives to justify investments in IT infrastructure. For example, the data collected from interview responses from the midsized companies indicated that results could be achieved by performing periodic review, and budget cycle. The researcher sees periodic review as a process of managing inventory for a certain period. It could be that the organization applies the method of inventory management system to determine the scalability of their IT infrastructure investments. However, the data did not reveal or explained in detail the period of evaluation of IT infrastructure within the organization. Detailed explanation for evaluation would have helped to ascertained when new investments in technology are needed in the organization. On the other hand, the data collected from one of the midsized companies noted that value can be created to the organization by performing life cycle program and upgrade technology design. From the researcher’s view point, the system life cycle management gives the organization a scalable solution to manage their IT infrastructure to increase performance and profitability. The use of system life cycle and technology upgrade approach by companies could possibly indicate that the management cares much on gaining competitive advantage. If that is the case, the organization conceivably invests in IT infrastructure because of the intangible benefits. This also reaffirms what has been noted above that 93.3% of the participants agreed to invest in IT infrastructure because of the intangible benefits realized from Investments in IT infrastructure. The theme on investments tracking was found from interview responses as note earlier in this study. The result obtained showed that these midsize organizations that were studied use software application to track their investments in IT infrastructure.

For example, when asked; how does your organization quantify and justify investments in IT infrastructure? The responses were: the amount of money generated by the IT department, we set measurable outputs, quantifiable deliverables, which are measured throughout the system's life-time. In addition, by carefully understood and analyze budget, available technology, and capacity of staff, weighed against goals and mission, by benefit against cost. Amount of time and materials saved, ROI, and compared expenses to offset them with future revenues or savings were also noted to be important. Included were: improved SLAs, higher profit margin, improved customer satisfaction, and so on. Stated that IT saved time and money, to make profit, reduce lead time, and increase efficiency to the work process.

When compared the result of the individual interviews from the data collected from the focus group, I noted that about 93.3% of the participants agreed that investments in IT infrastructure produced the desired results. In addition, the data reflected that about 33.3% of the participants agreed on using ROI model to justify investments in IT infrastructure, whereas about 66.6% of the participants used alternative approach to justify investments in IT infrastructure. From the result of the analysis, it appears that managers justified investments in IT infrastructure based on the required benefits realized from the investment. These benefits could be translated into efficiency, competition, customer services, and cost savings to the organization.

The result of the focus group session shows that 6.6% of the participants had different view about how managers justify investments in IT infrastructure. As indicated in the data collected from company C, “the process of IT investments is not easy to understand, and there should not be any process identification, but depends on the business strategies of the organization.” This statement agrees with Wessels (2003) as he asserted leaders of organizations adopted the same formal process in justifying investments in IT infrastructure, and tools used by accountants or managers to calculate cost
and benefits are not well understood. In addition, it could be that the subject on how managers justify investment in IT infrastructure was not based on the process used to quantify investments in IT infrastructure, rather was based on the behavior of managers. It could also be as a result of organizational culture, or lack of organizational change.

Overall, the findings in this study partially agreed with what was noted in the literature review. First, Dekleva (2005) noted that managers always used ROI to justify investments in IT infrastructure, but stated that not every calculation of ROI may be based on accounting calculations only. This study partially agreed with the statement. Findings from this study also showed that 33.3% of the participants use ROI to justify investment in IT infrastructure. Secondly, 93.3% of the participants were motivated to invest in IT infrastructure because of the benefits realized from the investment. These benefits include: efficiency, competition, customer services, and saving money. Previous researchers such as Wessels (2003), Symons (2008), and Dekleva (2005) argued that the use of ROI as a systematic process to justify investment in IT infrastructure does not account for these intangible benefits, and as such made the justification difficult to quantify. However, in this study, some of the responses were not relevant to the question. For example, when asked: what are the processes in place used by your organization to justify investments in IT infrastructure? The response from the interview was a strong training program that generates income for the corporation, End-user feedbacks, reduced bottlenecks, and data redundancy. The researcher does not think that strong training program that generates income appears to be a process to justify investments in IT infrastructure. I cannot say that the tool used to collect the data was flawless, but I conducted a pilot study to validate the questionnaire, and the result of the pilot study showed that the questions were clear and easy to understand. Possibly, it could be that the participant was not truthful or did not want to reveal the processes used in their organization to justify investments in IT infrastructure or did not understand the question clearly. Based on the findings, managers justify investments in IT infrastructure not usually because of its monetary value as ROI per se, but for the benefits realized in the investments such as increased efficiency, competition, customer services, save time, and money. All of these however, lead to better ROI in different ways. This result partially explained why managers used the formal processes to justify investment in IT infrastructure that does not account for these intangible benefits as noted in the literature review.

The conceptual/theoretical framework on which this research was based as noted earlier in this study focused on the goals managers set for themselves as stakeholders of the organization. As reflected earlier in this study also, Murphy et al. indicated that goal-based approach can be used to evaluate an organization by the goals that leaders set for the organization. However, organizational leaders have varied and sometimes contradictory goals, making cross firm comparisons difficult. Murphy et al. (1996) believed that organizations are of different forms, and based on the form, the organizational leaders could behave in certain ways causing researchers often to focus their study sample in a particular industry to control the differences regarding firm effectiveness and profitability. Based on the findings as noted above managers justify investment in IT infrastructure by the benefits realized from the investment. As noted by Murphy et al. (1996) on the goal-based approach the findings above possibly reflected on how managers justify investment in IT infrastructure. In addition, the result of the finding could be that organizational leaders have varied and sometimes contradictory goals, which reflected on how managers justify investments in IT infrastructure.

Summary

The purpose of the research is to investigate into how managers justify investments in IT infrastructure. The questionnaire responses and analysis of documented evidence obtained from the investigation were presented in this study. It was noted that 33.3% of the participants in midsized companies studied perceived that managers justify investments in IT infrastructure by looking at return on investments (ROI). In fact, about 93.3% of the participants saw a return on investments in IT infrastructure through benefits realized from the investment project. Previous researchers argued that, ROI model used to justify investments in IT infrastructure as a systematic process does not account for
the intangible benefits. For this evaluation, the perceptions of the earlier researchers on this topic appear to be that investments in IT infrastructure could be difficult to quantify. Based on the responses from the interviews and the focus group session, managers justify investments in IT infrastructure because of intangible benefits realized from the investment. The quantification of these intangible benefits into monetary values appears to be an issue that calls for investigation for future research.

**Recommendation for Action**

The findings are not generalizable because the companies used were purposefully selected. Regardless, the result of the study is important. The first recommendation is to the organizational leadership where the research was conducted. The recommendation for managers would be to adopt a scalable approach that has the flexibility to be quantified. I will recommend the earned value added (EVA) approach. However, ROI may be use but in agreement with the internal rate of return (IRR). Secondly, a recommendation for academia for publication purposes where a new approach to justifying investments in IT infrastructure may be developed that may be useful to organizations elsewhere. Therefore, the recommendation for academia is to develop a program were IT managers can be taught the approach to make investment decisions on IT projects. Future inquiries may be needed as well as to other public infrastructural advocates and decision makers. This approach may be included into an academic curriculum as well as in university sponsored seminars. In addition, this research can be adopted at within levels of organizations, economic development planning, leadership programs, government projects, environmental development, and infrastructure investment projects.

**Recommendation for Future Studies**

This study used a single case study to investigate into how managers justify investments in IT infrastructure. However, the study was exploratory and can go beyond those recommendations for action as stated above. This research study was conducted by purposefully selected three companies that met the study criteria. Irrespective of the above recommendations, the study set a platform for future inquiry. This study exposed factors managers considered when justifying investments in IT infrastructure, which will help organizational stakeholders for decision making processes, if considering Investments on IT. In fact, research in this area may be needed. The need would be to consider how these intangible benefits derived from investments in IT infrastructure could be quantified into monetary values as noted above. The success of the future study of Investments in IT infrastructure may be an intentional inclusion of many companies susceptible to investments in IT. The focus group did not reveal alternative approach to justify investment in IT infrastructure, but had slightly different perspectives from the individual interviews. In addition, it could be that the subject on how managers justify investment in IT infrastructure was not based on the process used to quantify investments in IT infrastructure, rather was based on the behavior of managers. It could also be as a result of organizational culture, or lack of organizational change. While the focal point for the future study centers on quantifying intangible benefits of investments in IT infrastructure, future studies should also look into other areas of IT infrastructural projects in general.

**Conclusion**

In all, the investigation into how managers justify investments in IT infrastructure was conducted because Organization leaders are dependent on IT (information technology) for corporate productivity; however, senior IT managers have expressed concerns about insufficient benefits from IT investments. Understanding the value-added benefit of IT investments is critical for decision-making in any organization. At the onset of this study, it appeared that most managers do not have a process to justify investment in IT infrastructure or may have a limited process. However, literature review shown that the process or model used such as ROI does not account, or quantify intangible benefits into monetary values. Several literatures stated that the method used by managers to justify investment
in IT infrastructure is not well understood and makes it difficult to quantify. I used a single case study
to explore how managers justify investments in IT infrastructure. In fact, discovered that manager
often times look at the benefits side of the investments not necessarily looking at ROI in terms of
monetary values. In this research, I have analyzed the results and gave recommendations for future
studies. I conclude this research study with the perception that how managers justify investments in IT
infrastructure was uncovered. Equipped with knowledge, I seek for a better understanding of the
subject with mind of participating in future studies of this inquiry.

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