

Challenges in Information System Procurement in Higher Educational Institutions in Ghana

Michael Omari Frank Amoani-Arthur George Essien
Department of Computer Science, Takoradi Polytechnic, P. O. Box 256, Takoradi, Ghana

Abstract
Information System/Information Technology (henceforth IS/IT) has become the cornerstone for the success of the modern business. The education sector continues to acquire information system/technology tools with some pecuniary interest as competition for the best students intensifies. Globalization accompanied by economic integration is also pushing competition among tertiary institutions to a new frontier driven by the deployment of ICT in both operational and management processes. The deployments have introducedadditional challenges to these institutions. The ultimate among such challenges is their procurement. In this paper we present challenges of IS/IT procurement in higher educational institutes in Ghana, using Takoradi Polytechnic (a public sector institution) as a case study. The main objective is to understand the processes in the acquisition of IS/IT products and to access the effectiveness of such processes in the procurement delivery. It employs questionnaire and interviews as its principal tool of data collection. The sources of data are both primary and secondary. A thorough analysis of our data revealed among others the following findings; software procurement does not go through the rudiments of strict procurement practices, inadequate funding, poor contractual provision for and ill-enforced service level agreement. Based on the findings we recommend close collaboration between the various stakeholders in the procurement process, technical training onIT procurement risks, contractual management capabilities and current best practices regarding the procurement of IS/IT products and services. We also suggest that Software acquisition should be formalized and given greater attention with proper financial allocation in annual infrastructure budget.
Keywords: deployment, Software procurement, Contractual provisions, IS/IT products, procurement practices.

1.0 INTRODUCTION

In modern universities, information has become one of the imperative management processes. Its production; transfer and consumption form a kind of foundation for efficient functioning of all spheres of social life. Correct and adequate usage of information flows in many ways determines the result of activities of any modern social institution, especially within the educational system.

Takoradi Polytechnic was established in April 1954 as a Government Technical Institute. For nearly 40 years, the institution operated under the organization and administration of the Ghana Education Service. During that period, it offered programmes mainly at the Craft and Technician Certificate levels in commercial and technical subjects. As part of the Ghana Educational Reforms which began in the late 1980s, Takoradi Polytechnic and five other similar institutions were upgraded by the Polytechnic Law 1992 (PNDC Law 321) to become part of the Ghana Tertiary Education System. The Polytechnics began to offer Higher National Diploma (HND) programmes in the 1992/93 academic year.

These reforms mandated the Polytechnics to complement the role of the Universities to increase access to tertiary education by training middle and higher level manpower for the country's needs. The student enrolments of Takoradi Polytechnic have been rising by the year. In view of the increasing student populations, management has been struggling in the past few years to use ICT as a platform for educational delivery in order to cope with these increases. Despite the uncoordinated approach to the deployment of ICT infrastructures in the past, some progress has been made in increasing access to and usage of ICTs in the institution. Until 2011, most of the Polytechnic's processes such as advertisement of programmes, sale of admission forms, issuing of admission letters to students, billing of students, payment of fees, registration of programmes/courses and to some extent teaching and management of students records were manually done at a great cost. These manual transactions are labour intensive, time consuming, stressful, and very expensive and involve the use of much paper. This situation has been heightened by the following challenges and constraints: Increasing number of qualified applicants the Polytechnic had to admit; Declining government subvention to polytechnics in Ghana over the years; Rising cost of education delivery using traditional methods; and Inadequate academic and physical facilities.

In 2007, Socket Works Global, an international ICT service provider, submitted a proposal that seemed to give total solution to the institution's ICT needs but that was turned down upon careful evaluation. It was revealed that all the polytechnics that adopted the Socket Works solutions were disappointed (Amegashie-Viglo, 2009).The stage for change was set in late 2008 when staff of the institution took part in NPT sponsored 'ICT Policy Planning Workshop' which was followed by the training of the IT staff by IBM Consultants on Content Management System (CMS) and Student Information Management Systems (SIMS). It was not until June 2010

when the real planning for the change took place.The objective of the Polytechnic is to be transformed into a modern ICT-enabled institution where teaching, learning, research, and all support processes are enhanced through ICT. The starting point is the establishment of an ICT Board followed by the development of an ICT Policy for the institutionthough yet to be implemented and then Ghana's ICT for Accelerated Development (ICT4AD) Policy which represents the vision of Ghana in the information age and addresses fourteen priority/focus areas.

This policy in line with the national vision and these thrust areas, Takoradi Polytechnic, which is mandated to train middle and top level human resource for national development, deemed it fit to have an ICT Policy in place. This ICT Policy serves as a guide to all Staff and Students of Takoradi Polytechnic with respect to how the computers and networks, the Internet facilities and all other ICT accessories are acquired and used. Public universities in Ghana are autonomous sub vented institutions with the trifocal mandate to teach, learn and research to ultimately enhance manpower for national development. Each of these institutions is involved in procurement and supply of goods and services that are essential for the core activities of the faculties, institutes, departments, offices and units. It is perceived that procurement professionals in these institutions face a unique set of challenges as workers are required to fully document and audit procurement processes that are often lengthy, labor-intensive, and time-consuming. Again public sector organizations, like the Takoradi Polytechnic have many rules, regulations, and directives that simply can't be avoided. Staff in the Polytechnic is overwhelmed with several problems that result in delay in the supply of goods and services to meet its core activities. Procurement of IS/IT goods and services appears laborious and frustrating to staff and management for the success of academic work. Delays in bidding and evaluation of bids, delay in delivery of materials by the suppliers to the Polytechnic, suppliers delivering wrong or poor quality materials and components, poor inventory, inadequate storage facilities are some of the problems faced at the Takoradi Polytechnic. Thus, the key focus of this paperis to lay the foundation for IS/IT procurement strategies that will meet key challenges confronting the tertiary institutions in their effort to migrate into the digital age.

The general objective is to examine the challenges in information systems procurement in higher educational institutions in Ghana. To achieve this salient goal, the paper seeks to identify and investigate the IS/IT procurement processes in HEIs, to evaluate the extent to which the processes support effective and efficient delivery of IS/IT products, to identify and examine the problems in the processes involved in the procurement of IS/IT products in HEIs and to propose or recommend solutions to those challenges involved in the processes. We seek to find answers to the following research questions:

- What are the processes involved in the procurement of IS/IT products in HEIs in Ghana?
- To what extent do the processes support effective and efficient procurement delivery?
- What can be done to mitigate/eliminate the challenges in the processes?
- Are there some institutional policies/practices that are sub-optimal to the procurement processes and ultimate goals?

The findings in this paper could be used as a guiding tool for the effective formulation of information systems related policies in higher educational institutions. Furthermore, the results could assist in understanding the acquisition of information systems in Takoradi Polytechnic and to use that as a basis for comparative analysis and study in future operations of higher educational institutions. Last but not least, it will also be beneficial to organizations on how to assess the performance of activity.

2.0 METHODOLOGY

This section describes the methodology employed throughout the entire paper. It discusses the research design, research setting, study population and sample size, sampling technique, source of data, data collection instruments, data collection techniques, data analysis and validity and reliability of response.

Research design provides a thorough description of precisely how the study was conducted. The research questions were designed to address the critical issues pertaining to information systems procurement and to determine the challenges that are affecting the procurement of information systems.This paper adopts both quantitative and qualitative approaches, specifically survey and comparative methods to evaluate the challenges in information systems procurement in higher educational institutions in Ghana. The approach of the survey method is to describe and explain the characteristics or perceptions of a population through a representative sample and produce results that could be generalized from the sample to the population. According to Goertz (2006), surveys would be meaningless if findings could not be creatively extrapolated beyond the limited world from which the sample has been derived.

Quantitative method is concerned with identifying certain characteristics (variables) in an identified problem and investigating to find out how those variables are distributed with the view to generalizing their behavior in terms of relationships with each other. It can also be seen as an attempt to quantify social phenomena and gather and analyze numerical data, and focus on the links among a smaller number of attributes across many cases. The goal of quantitative methods is to determine whether the predictive generalizations of a

theory hold true. The methodological implications of this paradigm choice are "simple theoretical models that abstracted from reality through the use of formal deductive analysis and mathematics" (Caplan, 2003).

Comparatively, qualitative methods is a generic term for investigative methodologies described as ethnographic, naturalistic, anthropological, field, or participant observer research. Qualitative process of inquiry has the goal of understanding a social or human problem from multiple perspectives. Qualitative research is conducted in a natural setting and involves a process of building a complex and holistic picture of the phenomenon of interest. The qualitative method investigates the 'whys' and 'hows' of decision-making, not just what, where, when. Hence, smaller but focused samples are more often needed than large samples (Flyvbjerg, 2006).

The paper used Takoradi Polytechnic as the setting. The Takoradi Polytechnic is an educational institution located in western part of Ghana. The institution has four schools namely; school of engineering, school of applied science, school of applied art and school of business. The institution also has a student population of six thousand nine hundred and thirty-two (6932) and staff population of nine hundred and thirty three (933), (Takoradi Polytechnic Planning Unit, 2016). Takoradi Polytechnic has two campuses at Effia (Takoradi) and Butumagyebu(Sekondi). The Takoradi campus is the main campus and houses the Schools of Applied Art, Applied Science and Engineering. The Sekondi campus caters for the School of Business Studies.

The target population was the management, staff and students of Takoradi Polytechnic as well as suppliers of IS/IT products. Table 1 gives an overview of the study population. In conducting a research study, it is practically impossible, time-consuming and too expensive to test every individual in the entire population. Therefore smaller chunks of a unit sample are chosen to represent the relevant attributes of the whole of the units (Goertz,2006). The sample size for this research was determined by making use of a sample size calculator with a 95% confident level and a confident interval of 10. Thus, we considereda sample size of 211 people appropriate and representative enough for the study.

Table 1: Computation of Sample Size

Item	Population	Sample size
Procurement Dept. staff	3	2
Head of Computer/ICT department	2	2
Stores Department	6	4
IT technicians	6	6
Suppliers/Consultants	15	13
Users-(2nd& 3rdyr-Students)	3000	93
-Teaching Staff	354	76
-Assistant Registrars	17	15
Total		**211**

Source: SPSS Output of Field Work, February, 2015.

A sample size consisting of 4 Management staff, 76 lecturers, 6 IT technicians, 4 staff from stores department and 93 students from second and third years out of the total number of staff and students were included in the study. Even though the study should have covered a lot more of the staff and students, the sample size of 211 was deemed appropriate and representative using a sample size calculator.

The paper adopts the purposive sampling technique. Purposive sampling is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research. The purposive sampling technique was considered after we carefully analyzed the nature of the research questions and objectives

The study is descriptive in nature and therefore the information presented is based on primary and secondary data. Primary data was collected using structured questionnaire. Secondary information was collected from various documents such as books, newsletters, reports, magazines, journals, internet, as well as from existing literature, which had bearing on information system procurement.

The main instrument used for the collection of primary data is structured questionnaire. The questionnaire was designed to contain mostly close-ended and few open-ended questions. The close-ended questions helped respondents respond more easily, and help the researchers to accumulate and summarize responses quickly and more efficiently. Some open-ended questions were also included to allow respondents answer in their own words to obtain their views on the challenges of information system procurement. With a clearly defined and purposive questions intended to investigate how institutional arrangement contributes to effective delivery, the researcher interviewed key personalities in various departments identified as players in IT procurement process. These individuals includes the head of IT Department, head of ICT Services Department and Head of Procurement Unit. It was intended to crosscheck the facts presented and to assess their validity that different individuals were asked questions which were related. Even though these individuals differ in their

perspective, they are supposed to play a coordinated role in ensuring good delivery of IT procurement.

We used questionnaires which were distributed to the respondents selected. Before filling the questionnaires, the aim and importance of the research were explained to the participants to enable them have an idea of why they were answering those questions and to encourage them to fill the questionnaire accurately. Respondents were given enough time to read the questionnaire thoroughly, understand it well and know what is expected before answering. The researcher explained portions of the questionnaire, which were not clear to the participant. The data collection processes covered a period of two weeks to ensure that all respondents are covered. All questionnaires distributed were returned.

Data analysis refers to the process of deriving meaning from the data that had been collected in a study. According to Yasin (2002), the ultimate goal of analyzing data is to treat the evidence fairly, to produce compelling analytical conclusions and to rule out alternative interpretations. Completed questionnaires were sorted out, collated and cleaned. Cross validation and consistency checks were done. The statistical tool which was used in analyzing this data is the Descriptive Statistics, thus frequency tables, cross tabulation graphs and other statistical methods. The main Statistical software, which was used in the analysis, was the IBM Statistical Package for Social Sciences (IBM SPSS).

The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. Reliability and validity of responses were given due consideration because of its critical importance in research. In a quantitative research especially, the researcher designs an instrument for measuring the responses which have been standardized. The researcher therefore designed the questions in such a way as to elicit all possible responses from respondents and in some cases was asked to state if not provided. In addition to this, participants were asked to leave out questions they do not understand until they obtain clarity from the researcher. The researcher sometimes took the pain to confirm some of the responses when in doubt.

3.0 RESULTS AND DISCUSSIONS

In this section, we present analyses and discussions of the results or findings of this paper. Authors have proposed procurement framework with a bifocal lens namely, acquisitionprocesses and management processes. We present our analyses and discussions of the findings thereof on the basis of this framework.

It is worth stating here at this juncture that Takoradi Polytechnic is a public tertiary institution and as such its procurement process must comply with the Public Procurement Act 663. Again, by virtue of it being a technical institution, it comes under direct supervision of certain mandated bodies that are tasked to regulate the activities of technical institutions. The procedure for procurement of IS/IT goods in Takoradi Polytechnic is quiet a lengthy and complicated one with a lot of individuals and bodies involved.

3.1 Socio-Demographic Background of Respondents

A total of 211 respondents was targeted to answer some form of questionnaire or were to be interviewed. Out of this number of questionnaires sent out, 175 were considered valid to be used for the analysis. This constitutes approximately 85% of the targeted respondent making it good enough representation of the total respondents. Table 4.1 shows the demographic data of respondents.

Table 2: Gender of respondents

Gender	Frequency	Percent
Male	109	60.9
Female	70	39.1
Total	**179**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

From Table 2, it was observed that 109 respondents representing about 61% were males which indicate the dominance of males in the IT area. The random nature of the selection of respondents for students and lecturers accounted for the close gap. It was however abundantly clear from the suppliers' end of the respondents and IT department's staffs was largely dominated by males.

Large numbers of the respondents were students and lecturers as demonstrated by their educational distribution in Table 3. It can be indicated that all the students possess Senior High School certificates or equivalent since they were all pursuing HND Programmes. A large number of lectures possess post graduate degrees as reflected. A large number of the remaining are engaged in procurement activities. Most of the suppliers departments were either degree holder or post graduate holders.

Table 3: Educational background of respondents

Qualification	Frequency	Percent
Certificate	60	33.5
Diploma	29	16.2
Degree	40	22.4
Post Graduate	50	27.9
Total	**179**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

In Table 4, we demonstrate the categorization of respondents into suppliers, users, stores department, IT technicians and management. Perceive that users constitute approximately 85% of the respondents. Followed by suppliers (7% approximately), IT Technicians and Management (about 6%) and stores department (2%).

Table 4: Categories of respondents

Respondents	Frequency	Percent
Suppliers	13	7.3
Users	152	84.9
Stores Department	4	2.2
IT Technicians and Management	10	5.6
Total	**179**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

3.2 Acquisition Processes

3.2.1 Internal Processes and how they contribute to effective procurement

The interview revealed that notion of coordination remains as farce as procurement department more often than not arrogate themselves certain responsibilities which is to be played by other individuals. They do not consult them in designing any technical specifications even though the institution does not have any documented minimum specifications standards for IT products they procure. The only aspect they are involved in is when it comes to software acquisition which the researcher discovered never goes through the procurement process. Indeed more than two third of the suppliers were engaged to supply hardware range of products whiles the remaining were engaged to supply communication products. This information is contained in Table 5.

Table 5: Nature of Items supplied

Item	Frequency	Percent
Hardware	9	69.2
Communication equipment	4	30.8
Software	0	
Total	**13**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

The head of department of the IT department expressed that lack of collaboration has led to acquisitions of shoddy products which fail to deliver to satisfaction. Stores Department on the other hand support the fact that in all cases of IT procurements, there is enough representation of IT Department persons to inspect items delivered and that they are sampled and tested by the IT Department before acceptance note is issued.

Table 6 indicates that there is a consensus among the Stores Department staff that IT Department is involved when it comes to the inspection and testing of delivered items.

The seaming contrasting views were as was discovered in various interviews, due to lack of involvement of the IT Department at the initial stages of procurement and the lack of formal communication between them.

Table 6: Testing of procured items before acceptance

Response	Frequency	Percent
Strongly Agree	3	75.0
Agree	1	25.0
Disagree	0	0.0
Strongly Disagree	0	0.0
Don't know	0	0.0
Total	**4**	**100**

Source: SPSS Output of Field Work, February, 2015.

3.2.2 Professionalism and Assessment of Procurement staff

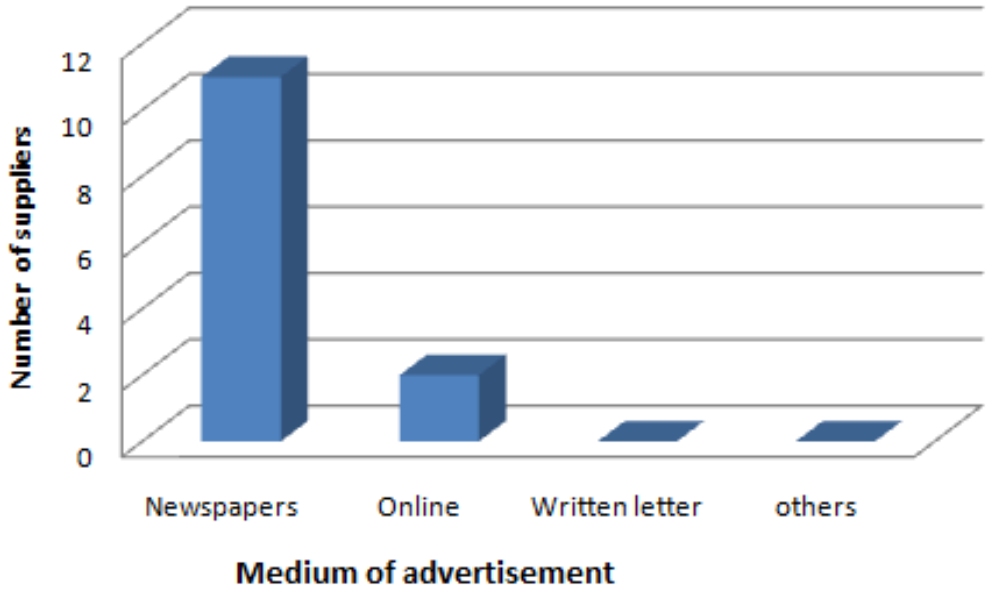
Professionalism in this context talks about the capacity of internal staff in effectively and efficiently handling procurement issues relating to Information Technology. It came out in the seminar organized by the Millennium Development Authority (MDA) in collaboration with Public Procurement Authority (PPA) that unprofessional procurement practices leads to waste of public funds (GNA Tuesday 9th February 2012). Data gathered from the interviews revealed that there are three (3) staffs from the procurement department. The IT Department has 2 Heads both of who possesses postgraduate degrees not relating to IS/IT. The Procurement Department is therefore under resourced in terms of manpower. In all the description of professionalism, procurement staff does not have the qualification and experience to handle IS/IT procurement process effectively. So there is the need for collaboration with the IT Department to achieving the goals of procurement.

3.2.3 Transparency of Procurement Process

In order to ensure transparency of procurement Act 663 of the Standard Tender Documents (STDs) sanctions the use of advertising procurement opportunities, public opening, publication of contract awards, resolving disputes and complains, and effective monitoring.Transparency International defines the term "Transparency" as a principle that allows those affected by administrativedecisions, business transactions or charitable work to know not only the basic facts and figures but also the mechanisms and processes (PPA electronic bulletin Jan-Feb 2012).

The researcher sought to find out whether the principles of transparency are duly followed. Of all 13 vendors who have participated in any bidding process, more than 80% of suppliers indicated that they got notice of the bidding event through newspapers whiles the rest got the information from online publications. So, in essence proper channels are used to disseminate information about the bidding process. Figure 1 depicts the statistics of the medium through participants were informed of the bidding event.

Figure 1: Medium through which bidding is advertised



The analysis reveals some efforts of transparency such as advertising using the appropriate medium has percentage score of about 85%. Also it was discovered that in all the procurement contracts, 80 % of participants sent their representatives in the opening of the sealed bidding documents submitted by individual vendors. Of those who were not present, 100% agreed having been informed of the date, time and location of the event and

were formally invited to witness. Asked about the degree to which monitoring and auditing is undertaken, the Head of Procurement Unit explained that all the processes involved are well monitored and audited. Thiswas however not substantiated. Schapper et al,(2003) suggested the use of e-commerce to enhance transparency through effective and monitoring of low value transactions, a solution that is affirmed by Smith-Deighton (2004). In accordance with the above discussion, Lewis and Roehrich(2009) affirmed that high value and complex procurement procedures must involve publicly available information on policies, bidding process, evaluation, and bid results.

The researcher also sought to determine whether evaluation criteria were disclosed to the bidders prior to the start of the tendering processes. Table 7 depicts the response obtained from suppliers.

Out of 13 vendors, 9 indicated that they had full knowledge evaluation criteria prior to the selection process representing about 70% of the respondents. Again crosscheck reveals that information on the contract awards, tender notices were widely publicized on the multipurpose corporate website of the PPA indicating a strong sense of commitment to transparency. It is also worth mentioning that Takoradi Polytechnic was listed among 36 public institutions who have submitted their procurement plans online to the PPA website (PPA electronic bulletin Jan-Feb 2012).

Table 7: Disclosure of evaluation criteria to suppliers

Response	Frequency	Percent
Yes	9	69.2
No	4	30.8
Don't Know	0	0
Total	**13**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

3.2.4 Competitiveness and Fairness

The researcher was also interested in whether procurement of IS/IT products are carried out in a spirit of competitiveness. It observed and critically analyzed the processes to ascertain whether it meets the requirement of fairness and competitiveness. Three important ingredients were considered in determining how competitive a procurement process is. These include ability of the medium of advertisement to provide room for as many bidders as possible, reasonability of the time frame for submission of bids to enable interested suppliers to tender and the magnitude of the number of bidders received per every procurement process. Fair assessment on the other hand is a very difficult task to be determined however the researcher gathered the perception of individual unsuccessful suppliers on how fair they were treated and whether they were debriefed after the selection process.

Figure 2: Suppliers response to period given to respond to invitation to tender

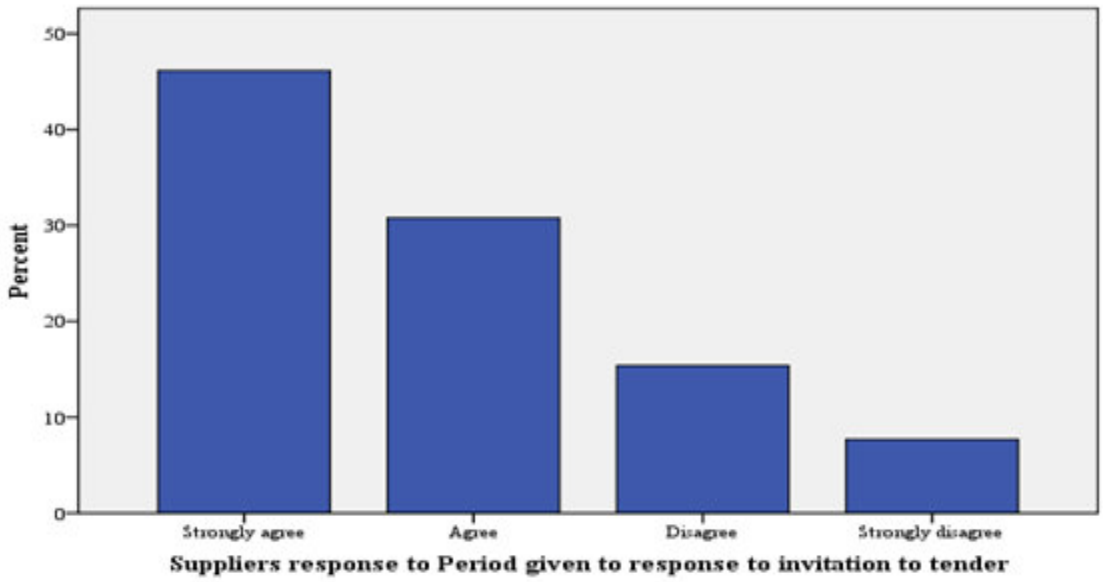
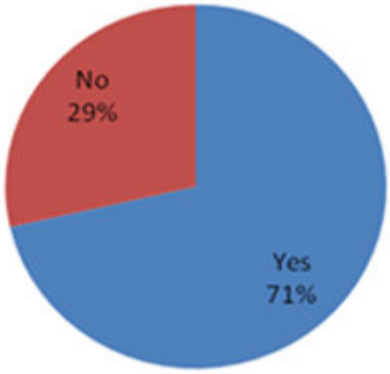


Figure 3: Debrief of unsuccessful bidders after selection process

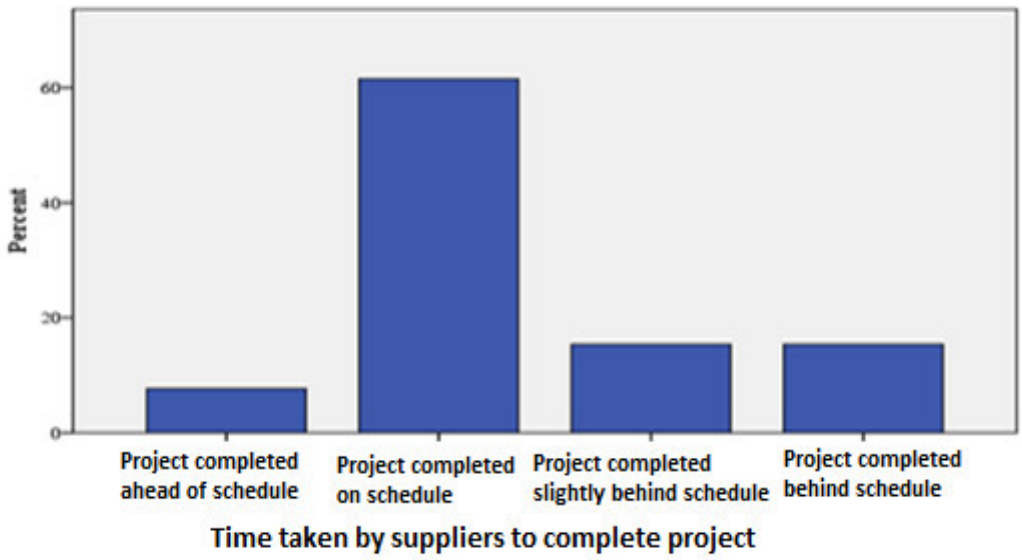


From figure 3, more than two-thirds of suppliers who were not successful in winning a bid alluded to the fact that the institution debriefed them after the bidding process.

3.2.5 Efficiency and Value for Money

Value for money remains one of the most critical benchmark for determining the efficiency of procurement. The researcher wanted to know whether in the procurement processes observed in IS/IT procurement, care is taken to ensure that the institution obtains Value for money (VFM). In assessing efficiency and value for money the researcher was interested in issues of contract management, implementation schedules and post implementation maintenance (Bauld and McGuinness, 2006). Figure 4 shows the response of suppliers on the time taken to complete project awarded. 60% of the respondents agreed having completed the execution of their projects on time. 30% of the projects were behind schedule whiles just 10% of the projects were completed ahead of schedule.

Figure 4: Time taken by suppliers to complete project



This is not surprising for IT projects but still not satisfactory since most of the projects have to do with supply of IT hardware; installation of which is done in-house. Most of the hardware procurement undertaken by the institution did not include installation agreement and therefore were undertaken by technicians at the IT Department. Of the 30% of the projects which were behind schedule the respondents were asked to state the cause of the delay. Table 8 summarizes the results.

Table 8: Causes of procurement delays

	Project	Frequency	Percent
Valid	Logistics and Technical constraint	1	7.7
	Non Performance of obligation by purchaser	2	15.4
	Expansion of the scope of project	1	7.7
	Total	4	30.8
Missing	System	9	69.2
Total		**13**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

It can be seen that logistics and technical constraint accounted for more than 25% of the causes of projects delay. More than two-third of suppliers indicated that there wasn't any additional cost incurred which was transferred to the institution as a result of the late execution. Table 9 demonstrates cost implication of projects delay. Observe that about 77% of the respondents claims that no cost implication associates with projects delay. The remaining 23% affirms the possibility of projects delay to come with its own cost.

Table 9: Responses on cost implication of projects delay

Response	Frequency	Percent
Yes	3	23.1
No	10	76.9
Don't Know	0	0.0
Total	**13**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

The researcher further investigated the level of seriousness that is attached to contract and contract management. First was to find out from the vendors whether there was any contract administration after they were awarded the contract. The response is captured in table 10. There is a strong indication that the institutions attachlotseriousness when it comes to ensuring that IT contracts are properly drafted, documented and agreed upon. The contract administration definition which includes the roles and responsibilities of parties to a contract as regards IS/IT procurement has a percentage score of 76.9. This shows that there is a good contract administration culture, the details in terms of definitionhowever cannot be fully guaranteed.

Table 11: Contract administration after contract was awarded

Response	Frequency	Percent
Strongly agree	7	53.8
Agree	3	23.1
Disagree	3	23.1
Strongly Disagree	0	0.0
Don't know	0	0.0
Total	**13**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

This is particularly of great importance to IS/IT procurement contract because of the numerous technicalities involved in IS/IT products especially when it comes to software contract administration. Ensuring value for money in IT procurement contract requires a definition of detailed roles and responsibilities on the part of the vendor in order to avoid hidden cost.In all contract of procurement under investigation, none of them included any anticipation of disputes and how it was to be resolved as depicts in Table 12. All respondents (suppliers) were unanimous on this with a percentage score of 100. This demonstrates a very shallow definition of the contract terms and a potential caveat for default of duty on the part of vendor if such issues are not properly dealt with.

Table 12: Anticipation of disputes in contract of procurement

Response	Frequency	Percent
Yes	0	0.0
No	13	100.0
Don't Know	0	0.0
Total	**13**	**100**

Source: SPSS Output of Field Work, February, 2015.

Though most of the contract included an agreement of clear terms of service and service level agreement (SLA), non-performance and underperformance still persists. This was reflected in the users' negative remarks about the availability of certain ICT facilities. In Figure 5, itis evidence that users are not content with service availability. More than two-thirds of respondents disagree with the view that internet service is available most of the time. For instance the SLA for internet provision exists which stipulates availability and bandwidth of the internet which must be met by the provider but this is not properly monitored to ensure compliance. Informal channels, mainly phone calls have been the medium of channeling complaints according to the Head of ICT Department. This was confirmed by the responses of the provider who agreed to the informal means of communication of service disruptions (Andreica, and Iustin, 2004). The general score was 84.6% informal and 15.4% formal (Table 13). An indication of the strength of seriousness attached to service delivery and the level of tolerance to breach of service agreement. Marketing literature confirms this phenomenon by asserting that when customers are dissatisfied, they are more likely to resort to informal means rather than formal means of communicating their displeasure.

Figure 5: Availability of internet service all the time

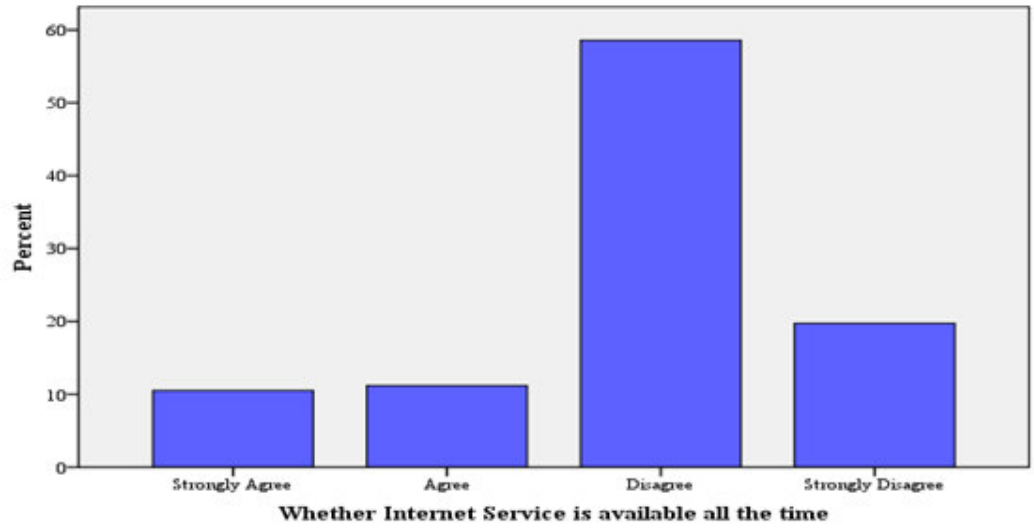


Table 13: Medium of channeling complaints

Complaint	Frequency	Percent
Formal	2	15.4
Informal	11	84.6
Total	**13**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

In between contract administration and implementation of the terms of the contract, it appears there is a lacuna in getting the vendors to comply with the agreed terms. Wireless internet facility is not visible at areas they are meant to cover. Bandwidth most often falls below the agreed size.

There is no record that shows that a vendor's contract has been terminated on the basis of non-compliance which indicates that the institution is not pressing hard enough to get suppliers to comply with service level agreements. It is also clear that relationship management is not formalized and was the Head of Procurement who agreed that they do not have any institutionalized policy or strategy to managing relationship with IT suppliers. After analyzing top 518 companies to determine the degree of formalization of IT supplier management practices, it wasconcluded that "formalization of the supplier management function appears,

unsurprisingly, to be a function of the size of the organization and the number of suppliers it utilizes."(Palaneeswaran and Kumaraswamy, 2000).This confirms the practice. The IT procurement function appears to be one which is evolving and developing even though it is becoming a routine task of Procurement Departments in many institutions.

3.3 Management of Acquired Is/It Resources and Challenges Involved

This is the second phase of procurement activities and comprises all activities that ensure that procured items serve fully their useful/expected lifespan.

The researcher was interested in finding out the institutions' challenges regarding compliance with internal standards and external regulatory body standardsof procurement as well as in the management of the acquired IS/IT resources.

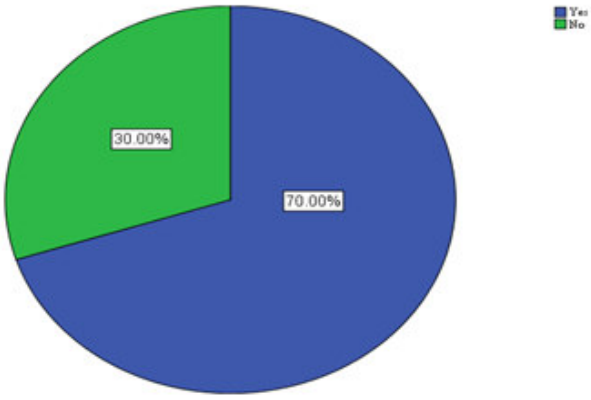
It was gathered that there is a serious challenge when it comes to financing of IT projects. This could be a more general problem than just an isolated case of IS/IT procurement as public institutions continue to work under tight budgetary constraint due to dwindling support by governments. Professor Adow-Obeng (former vice chancellor of the university of cape-coast) asserted that "over a decade now the funding of tertiary education by government had systematically been reduced and could hardly meet 50 per cent of the funding requirements of the institutions" (GNA, 2008). This statement is confirmed by Young, et al. (2007) "for public institutions, state legislatures are increasingly reluctant to boost annual subsidies, and many are actually reducing amounts historically allocated to higher education". Delay in processing payment vouchers is also partially responsible for the delays. This was confirmed by Weele and Van, (2010) and Nketia (2009) who noted that "procurement procedures were embedded in a lot of bureaucracy and this delays the procurement process". Because contracts are normally executed before payment is made there has been abuse of the situation causing suppliers to lose confident in the institutions ability to honor its financial obligation under procurement contracts.

Misuse and the lack sensitization of the user community on the use of procured IT infrastructure affect the lifespan of procured items. There is also too much pressure on the facilities causing them to break down before their expected lifespan. The documented standards regarding lifespan of infrastructure provide a good source of reference in accessing the quality of items acquired from suppliers.

When respondents were asked whether there exists documentation on life expectancy of procured infrastructure, 70% of them agreed that such a document exits but out of that, 80% said the expectations are not being met. Figure 6 indicates their responses.

For instance the capacity of labs on campus is about 200 computers for all three general labs on campus but just about 50 are in good working condition. Offices computers are almost always in good working condition except virus infections which often causes them to malfunction. The institution did not have any ICT user policy until 2011 but as of now, the policy is yet to be accepted and implemented formally.

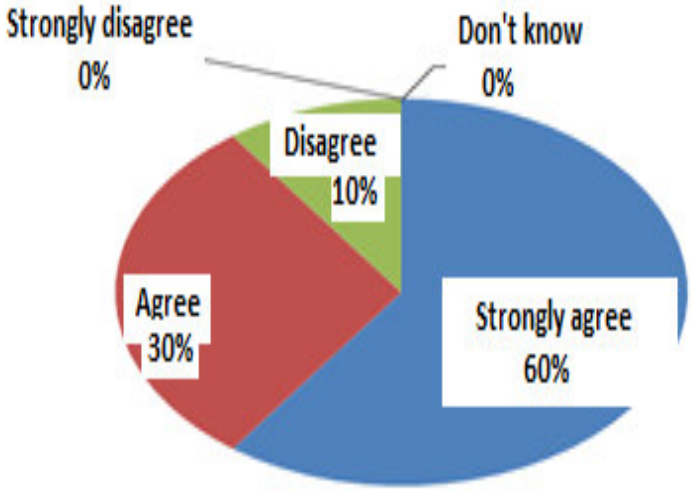
Figure 6: Documentation of lifespan of ICT equipment



Poor security of systems has resulted in theft of procured computers over the period. Indeed all participants responded that there has been at least one incident of theft. Figure 7 provides an overview of the responses. 80% of respondents agree that security of ICT resources is a major challenge to the institution. The institution has recorded not less than three incident of theft for the past three years. Items stolen included newly procured computers meant for e-learning library, lab computers, reserved flat screens, and memory cards. The issue of securing computers and other ICT infrastructure did not engage serious attention until the institution lost more than 40 flat screen LCD monitors in kept at the ICT center. For instance the institution did not have secured stored room for computers and accessories. Not all IS/IT procurements are channeled through the

procurement department. It was observed from the interviewees that software procurement does not go through the rigorous procurement process that is expected. The procurement department was not even aware of certain major procurement such as Student and Academic management software which the institution is operating with.

Figure 7: Security of ICT infrastructure as a challenge to the institution



Respondents were asked whether there are periodic sponsorship programs or capacity building courses/workshops to enhance their technical abilities in carrying out their work efficiently. Out of the valid responses 90% objected to the view that they receive periodic training. Table 14 presents a summary of the results of their responses. With a support staff who are not skilled (supported by IBM's community service report on T-SIMPLE project undertaken in the institution) and the lack of proper service level agreement, continuous support and maintenance of systems is of grave concern.

Table 14: Sponsorship of technicians/supporting staff to upgrade their skills

Response	Frequency	Percent
Strongly Agree	0	0.0
Agree	1	10.0
Disagree	4	40.0
Strongly Disagree	5	50.0
Don't know	0	0.0
Total	**10**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

Respondents indicated that management is insensitive to their working conditions. 70% of them said they are not properly resourced to perform their duties of maintaining and upgrading of ICT infrastructure. No amount of complaints in both verbal and written communication has changed the situation.

Table 15: Equipment of technicians /supporting staff with adequate tools

Response	Frequency	Percent
Strongly Agree	0	0.0
Agree	3	30.0
Disagree	6	60.0
Strongly Disagree	1	10.0
Don't know	0	0.0
Total	**10**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

We also carried out investigation on the extent of maintenance of equipment. The revelation is that there is lack of routine maintenance of equipment causing them to breakdown beyond repairs. More than two third of the respondents agree that there exists a scheduled maintenance plan but this plan is not strictly adhered to. A look at Table 16indicates that 80%of respondents strongly agree or agree to the fact that maintenance schedule exits. Out of this percentage 80% agree that the schedule is not duly followed. This demonstrates that there is lack of preventive maintenance which can go into retaining systems capability and availability before the

occurrence of any problem.

Table 16: Scheduled maintenance plan for ICT facilities

Response	**Frequency**	**Percent**
Strongly Agree	4	40.0
Agree	4	40.0
Disagree	2	20.0
Strongly Disagree	0	0.0
Don't know	0	0.0
Total	**10**	**100.0**

Source: SPSS Output of Field Work, February, 2015.

We found out that there exist good inventory taken system for both hardware resources but not much can be said of software. Generally respondents agree that inventory taking is in proper order. A percentage score of 90% is an indication of good auditing practice which can minimize incidence of pilfering (see Table 17). However interviews revealed that the auditing work is over concentrated on hardware with little emphasis on software. There are also strict rules governingthe use of computer laboratories by students. Withdrawal of privileges in the use of the laboratory is strictly enforced when there is repeated violation in the rules (Kumar and Kumar, 2005).

Table 17: Periodic auditing of ICT resources

	Frequency	Percent
Strongly Agree	3	30.0
Agree	6	60.0
Disagree	1	10.0
Strongly Disagree	0	0.0
Don't know	0	0.0
Total	10	100.0

Source: SPSS Output of Field Work, February, 2015.

In spite of the existence and enforcement of the rules, laboratory equipment mainly do not meet their lifespan expectations. We administered questionnaire to various categories of users of ICT infrastructure to determine the overall performance of procurement processes. The result is summarized in the Table 18. As we infer from the summary of users experience on the basis of some key ICT service parameters, a user experience 'index' of 3.32 indicates that procurement is a little above average per the view of users.

Table 18: Overall performance of procurement process

Parameters	**Score (1-5) 5 being the most desirable**
Service recovery	3.8
Service Availability	2.0
Contribution of Service to work	4.5
Service utilization	3.0
Overall Average	**3.32**

Source: SPSS Output of Field Work, February, 2015.

To summarize, we sought to determine the procurement processes and management practices adopted. Procurement standards are generally good mainly because of the supervisory bodies regulating the activities of the institution. As a results there is to a greater degree, good procurement practices in terms of acquisition. Management of the acquired infrastructure on the other hand is fairly poor. The challenges involved in these processes have been outlined. Through interviews and questionnaire we have been able to establish some of these challenges by analyzing the responses. The interview and the questionnaire have focused on acquisition processes as well as internal management practices and supplier relationship management.

4.0 CONCLUSIONSAND RECOMMENDATIONS

The challenges associated with procurement of IT product and services in tertiary institutions in Ghana are multidimensional ranging from technical, financial to internal structural dynamics. The findings as unfolds by our analytical framework are summarized in the discussions below.

Software acquisitions is not regarded as procurement department function but a function of just the IT department and are not in the records of the procurement department regardless of the amount involved. We

were unable to gather sufficient evidence to ascribe reason(s), but we observed that personnel are not skilled enough to handle matters in relation to software procurement. This could be the underlying force that prevents such projects from going through scrutiny as required of average IT procurement projects. This potentially has the tendency to derail public procurement objectives as such projects are handled exclusively by the top hierarchy with technical consultations from the IT department (Salerno, 2009). It can be a manifestation of a rather serious phenomenon where service oriented procurement considered as intangibles does not go through the rudiments of procurement processes.

A sober reflection manifests the lack of involvement of the IT department in the procurement of IT infrastructure at the early stages of procurement. This hasoften degenerated into wrongchoices which have ultimately impacted on overall efficiency of IT procurement. It is worth reasoning with Moe, et al.(2006) who noted that if the technical requirement is lacking in detail then the system might not be what the organization envisioned and that may jeopardize the success of the project.

.We candidly inform that even though care is taken to ensure that procurement comply with set standards and guidelines with the hope of achieving their objectives, compliance to service level agreement is not given much attention. This is against the backdrop of the need to conform to public procurement standards and the auditing of procurement documents by external auditors. Furthermore, we have been able to uncover the poor maintenance culture of procured infrastructure which ascribes to lack of training and upgrading of technicians.

Finally, it has been evidenced that there is lack of adequate funding for ICT projects and when funding is made, often times there are delays in the payment process. Delay in payments is often routed in the cumbersome nature of payment system. Most tertiary institutions have responded to the financial challenge by introducing ICT fee in the components of list on fees paid by students. However the funds have not served the purpose of financing such projects.

Conclusively, numerous challenges confront tertiary institutions in their quest to implement technological tools in their operations and management. The acquisition of IS/IT product poses less challenge as compared to the management of such resources. The decoupling of such a function (outsourcing) from regular academic management business should also be critically considered especially in tertiary institutions where threshold of full actualization have been reached in respect of ICT penetration. More quantitativeresearch is required to see how beneficial it will be to such institutions. By offering an account of the IS/IT procurement practices and the challenges involved in tertiary institutions in Takoradi Polytechnic, this paper presents a teaser for further research in understanding contractual issues relating to IS/IT procurement and perhaps a consideration of cross/comparative analysis of the institutions in the private and public sectors to see if IS/IT procurement practices is significantly different (Chaw, 2002).

Based on our findings, we recommend the need to train personnel of the technical team on the rudiments of IT procurement risks, contractual management capabilities and current best practices regarding the procurement of IS/IT products and services. Procurement contracts management needs to be taken serious and must not be buried under the avalanche of financial inadequacies. Technicians and supporting staff should be well resourced and motivated to carry out proper maintenance of infrastructure.

We also suggest proper planning of procurement budget and discipline in the use of funds meant for procurement of ICT infrastructure. Software acquisition procedures need to be simplified with proper allocation in the ICT annual budget. There must be discipline in the use of funds earmarked for ICT infrastructure.

Finally, we propose a candid advice in respect ofperiodic monitoring and evaluation to ensure that suppliers conformto the agreed terms of service. Proper benchmarking and standardization policy must be adopted to enable professionalism and best practices regarding IS/IT management.

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