1055-03

The extent to which risk management tools are utilised within South African government departments: focus on IT investments

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ABSTRACT

IT investments are often characterised by very high levels of risk. This study investigates the extent to which various risk management tools are utilised by decision makers within the South African government departments when evaluating IT investments. The response pattern indicates that risk management tools are rarely used to evaluate IT investments. Other than sensitivity analysis, decision tree analysis and Monte Carlo simulations, no other risk management tools were mentioned as alternate tools utilised by the institutions to determine and manage risk associated with IT investments. The study has revealed that the return on an IT investment cannot be determined with certainty if the risk associated with such investment is not well managed. The other complication when managing the risk associated with IT investments is that IT investments are rarely once-off projects. Therefore, the risk analysis should be done over several years.

Key words: benefit, cost, investment, measurement, return, risk

JEL classification code(s): *****

INTRODUCTION

Risk is one of the major challenges that decision-makers have to tackle when they evaluate capital investment proposals (Anandarajan & Wen, 1999:330). The world within which decisions have to be taken is characterised by significant risk and uncertainty (Yao & Jaafari, 2003:57). Thus the investors' view of the risk must be accounted for in the process of capital budgeting and under uncertainty the future variable is not characterised by a single value but a probability distribution of its outcomes. This is more relevant in information technology (IT) than in other capital investments, since the level of uncertainty about the possible outcome is very high.

The high level of uncertainty relating to IT is also confirmed by Eccles, Julyan, Boot and Van Belle (2004), who state that one of the most recent studies conducted in the 21st century regarding the major IT projects indicated that:

- 90% of IT projects were over budget;
- 98% had changed the original objectives or scope;
- 20% were inappropriate for users' requirements; and
- 30% applied risk analysis.

The amount spent by the South African government on IT is very significant. The State Information Technology Agency (SITA) (which serves as the government's IT procurement entity) states that government spent more than R 10 Billion over the past five years (between 2004 and 2008) in procuring IT services and products (herein referred to as IT investments) on behalf of various government departments and institutions (GovTech 2010). Swann (2005) states that the investment decision to acquire IT should be considered an integral part of the overall risk assessment of the institution. It is, therefore, expected that the South African government should be utilizing pertinent risk management tools when evaluating IT investments since government spends huge amounts on IT. This study investigates the extent to which the risk management tools are used when evaluating IT investments within the South African government departments and institutions.

RESEARCH METHODOLOGY USED

A conference known as the GovTech is normally held on annual basis in South Africa. This conference is organised by SITA on behalf of various government departments and government owned institutions. Each of the two previous conferences in 2007 and 2008 was attended by more than 400 IT decision-makers. These participants are mainly IT decision-makers for various government departments, municipalities, parastatals and various corporates. The GovTech 2009 conference was attended by 2 200 delegates representing various government departments and other major role-players in the South African IT industry. All these delegates received the research questionnaire in their delegate bags. At the beginning of the conference, the participants were briefed by the conference directors on the purpose of the questionnaire. Most importantly, the ethical aspects of the research were highlighted. The participants could submit a completed questionnaire at the end of any of the three conference days. A total of 405 completed questionnaires were received.

The GovTech 2009 delegates constituted a judgment sample for the population. It is not the intention of the study to make inferences about the population. According to Bradburn and Sudman (1988:6), inferences cannot (strictly speaking) be drawn from a non-probability sample about the proportion of the population manifesting (or not manifesting) a particular characteristic. This view is also shared by Lunsford and Lunsford (1995:5), who state that it cannot be assumed that the non-probability sample fully represents the population. Therefore, the inferences in this study only refer to the institutions that were represented at the GovTech 2009 conference.

The mean and variance analysis were done using the statistical tool known as the Analysis of Variance (ANOVA). Thereafter, the Levene tests for homogeneity of variances and the Brown-Forsythe robust tests of equality of means were utilised to provide proof on the validity of the ANOVA findings.

SOME MAJOR TOOLS DEVELOPED TO DEAL WITH RISK

There is a variety of tools proposed to deal with risk associated with capital investments. One common risk factor in the views expressed by Yao and Jaafori (2003) and Fichman (2004) is the degree of uncertainty pertaining to IT investments. These authors state that some of the traditional approaches used to deal with uncertainty associated with IT investments (and in that way minimise the risk associated with such investments) include the following:

- *Sensitivity analysis*. This determines the impact of the changing variables to the outcome/desired results. It entails the interrogation of the 'what if' scenarios in detail;
- *Monte Carlo Simulation*. This technique uses repeated sampling from the probability distributions assigned to each of the variables underlying the cash flow; and
- *Decision tree analysis*. The technique maps out all feasible managerial actions contingent upon the actual market and the responses at the time of project execution.

For the purpose of this study, only the above three major risk tools were considered to be pertinent. In addition to the above tools, the respondents were requested to mention any other tools (other than the three indicated above) used in their institutions to deal with risk associated with IT investments. The three major risk tools are briefly described below.

Monte Carlo Simulations

Monte Carlo simulations were first developed for the nuclear industry and derive their name from the city of Monaco, whose main attraction is a casino (Schumann, 2006:11). These simulations can be used as a tool to realistically quantify uncertainties surrounding many of the estimates used to model long-term investment decisions (Kelliher & Mahoney, 2000:45). According to Schall and Haley (1988:232), the simulation is one of the most reliable methods if complete

probability distributions for the possible results are desired. This method is normally applied where big projects are involved and the financial and non-financial benefits are significant enough to justify the time and effort involved.

Decision Tree Analysis

Decision tree analysis is a tool that helps in comprehensively and reasonably evaluating future decisions (Schall & Haley, 1988:232). It involves a diagram that has branches, hence the name ‘decision tree’. Each branch reflects an alternative future decision and possible state of affairs. Decision tree analysis teaches one how to ‘prune out’ future possibilities and develop more accurate probability distributions. According to Davies and Boczko (2005:393), the decision tree analysis can also be described as the pictorial method of showing a sequence of interrelated decisions and their expected outcomes. This analysis can incorporate both the probabilities of, and value of expected outcomes.

Sensitivity Analysis

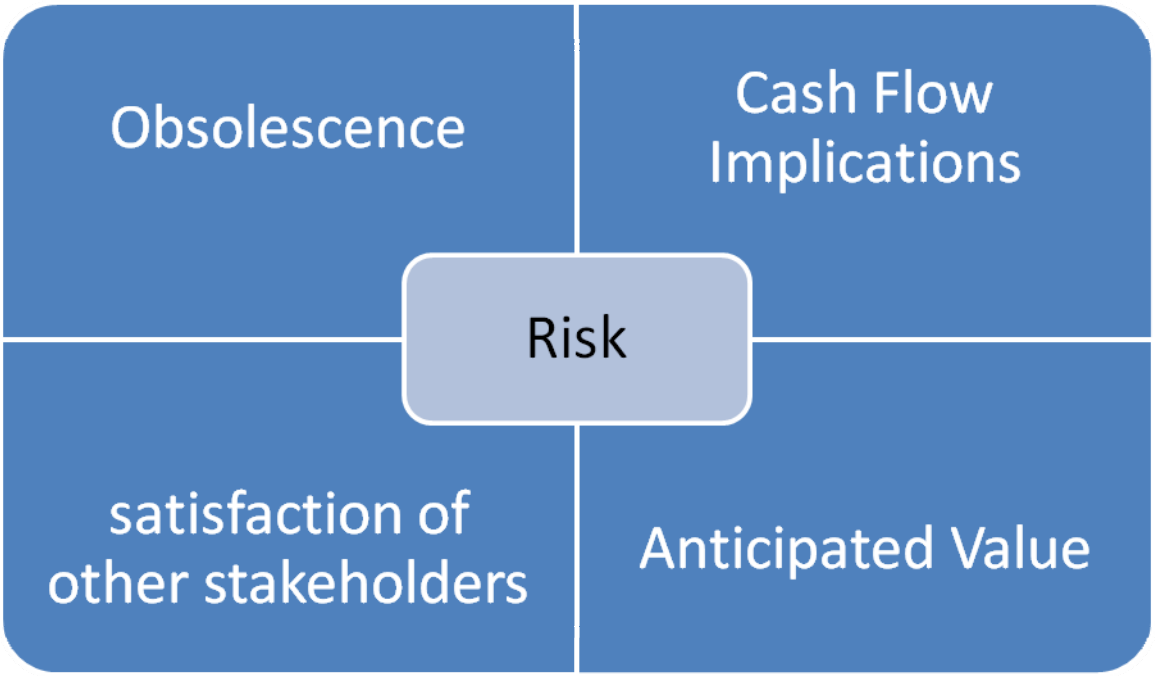
The sensitivity analysis is a modeling and risk assessment tool in which changes are made to significant variables in order to determine the effect of the changes on the planned outcome (Davies and Boczko, 2005:752). Thereafter, particular attention is paid to the variables classified as being of special significance.

The utilisation of the above three risk tools within government departments and other government owned institutions will be viewed from four perspectives. These perspectives are described below.

DIFFERENT RISK PERSPECTIVES PERTAINING TO IT INVESTMENTS

The article confines the risk associated with IT investments to four perspectives. These four perspectives were extrapolated from the study conducted by Gama (2010) on *The Efficiency of Capital Investment Decisions Pertaining to the Information Technology: a multi-institutional approach*. These four perspectives are summarized in the following **FIGURE 1.1**

FIGURE 1.1: RISK PERSPECTIVES PERTAINING TO IT



SOURCE: Extrapolated from GAMA, M (2010)

Obsolescence risk perspective

The risk can be viewed from many perspectives. For example, Delisle, Giunipero and Hillison (1987:38) state that one of the major risk factors that need to be taken

into consideration when considering an IT investment is the risk associated with **obsolescence.** The IT advancements are very frequent; therefore, it is imperative that the decision makers consider the risk associated with such obsolescence.

In South Africa, various government departments and institutions are mostly informed by Intel (the global supplier of computer chips) on the possible future changes to the technology. This enables them to minimise the uncertainty pertaining to technological developments. In spite of Intel informing large clients about the envisaged technological changes, IT developments (in terms of improved speed, memory etc) happen too rapidly for any person to be always up to date.

IT hardware is often upgraded on an annual basis, leaving the institution with obsolete equipment within few months of huge capital expenditure. Consequently, it is imperative that the returns realised should be significantly higher than those returns on capital equipment not associated with high obsolescence risk. The study tests whether or not the decision-makers within government departments and government owned institutions take the obsolescence risk into consideration when they evaluate IT investments.

Cash flow implications perspective

The second perspective (other than obsolescence) of the major risk issues pertain to the fact that the IT investment might not give rise to the **anticipated cash flow implications**. Farragher, Kleinman & Sahu, (1999:137) suggest it is vital to conduct a risk-adjusted evaluation of forecasted cash flows attributable to the IT investment. In addition to the difficulty associated with the determination of the IT investment cash flows, the amount of risk associated with the cash flow implications is not easily quantified. Therefore, it is crucial to take into consideration the impact that the possible non achievement of such cash flow expectations might have on the success of the IT investment.

The risk associated with cash flow implications cannot be properly handled unless the decision makers know the total true cost of the IT investment, hence, the

success of risk management has to take into consideration all the obvious and (often hidden) other costs that might be incurred during the life of the project. This is in line with the views expressed by Dedrick,, Gurbaxani, and Kraemer (2003:26), who say the true cost of IT investments is often underestimated. They argue that it is difficult to estimate the cost of computer hardware, labour, software and services over the life of the IT project with a high degree of precision. Importantly, in most instances these costs do not even include the cost of complementary investments such as training and process re-engineering, which can be much larger than the actual investment in IT.

Given these caveats, it is possible that IT investments currently show higher than normal returns. According to Dedrick, et al. (2003:26), there are several reasons why this could be the case. IT investments might be riskier than other investments. Firms invest when the net returns are sufficient to cover the risk-adjusted cost of capital. This would imply that returns need to be higher to compensate for the additional risk. The risk of these investments is often not assessed. Moreover, there might be adjustment costs that might need to be taken into consideration when IT investments are evaluated.

Anticipated value perspective

The third perspective relates to the **anticipated value** that is expected to accrue from the IT investment. The institution can determine the net value attributable to an IT investment by referring to three major elements, that is, cost, risk and return. Franklin (2006:22) endorses the view that IT value will only be realised if value drivers are clearly understood throughout the institution. This study will determine the extent to which these value drivers are understood within the institution.

Young, Memelstein and Williams (2000:17) argue that while four in five decision-makers believe IT adds value, only one in five believe they can measure this value. Various major steps are recommended by Young, Memelstein, and Williams (2000:17) in order to promote objectivity when making IT investment decisions:

- Clearly communicate strategic direction to provide context;

- Screen investment ideas early for consistency with business needs; and
- Ensure that business cases provide insights on investment benefits, costs, risks and key sources of value.

The major risk issues pertaining to the above steps can be summarized as follows:

- What risk issues arise if the IT investment is not in synch with the strategic direction of the institution?
- What risk issues arise if the IT investment is not compatible with the needs of the institution? and
- What risk issues arise if the IT investment does not deliver the anticipated value to the institution?

Other stakeholders' perspective

The fourth perspective relates to the impact of the IT investment on **other stakeholders** within the institution, that is, the extent to which IT benefits spill over to others within the institution. An understanding of whether these "spill-overs" exist and how they occur is central to developing a comprehensive framework for understanding the returns on IT investment (Dedrick, et al., 2003:28). It is often expected that the IT investment might improve the overall performance of the institution.

Thompson (1996:6) believes that there have been no efficient methods applied by entities in both private and public sectors to measure the impact of IT investment on the institution's overall performance. Consequently, whatever cannot be measured is often not monitored or implemented. In a South African study conducted by Garg, Joubert and Pollisier (2005), it is suggested that it is not the IT support or investment in IT that impacts on the performance of the institution, but rather the efficient use of IT support in meeting the information needs by various stakeholders within the institution.

EMPIRICAL EVIDENCE OF THE STUDY

A total of 405 respondents returned the completed questionnaires out of 2 200 delegates that received such questionnaires. This reflects a response rate of 18% which is acceptable from the academic perspective. More than 80% of the delegates that returned the questionnaires represented government departments, municipalities and entities owned by government. Consequently, the title of the paper puts a generalization on the response as indicative of response by government personnel. The other respondents (less than 20% of the total respondents) represented the JSE listed and private companies. There were 15 incomplete responses.

The overall utilization of risk management tools within government departments and institutions

The response pattern indicates that sensitivity analysis is used by 27.4% of respondents. This is followed by decision tree analysis (19.0%) and Monte Carlo simulations (3.8%). These response patterns indicate a very low favourable response on all three risk tools discussed in this study. Other responses were ignored due to the fact that they were not likely to add much value to the study.

The following **TABLE 1.1** and **TABLE 1.2** indicate the pattern of the responses regarding the extent in which the risk tools are used within various South African government departments and institutions.

TABLE 1.1: Risk associated with IT investments

		Sensitivity analysis	Decision tree analysis	Monte Carlo simulations	Other 1 (please specify and tick)…… ……..…… ……...	Other 2 (please specify and tick)…… ……..…… ……...
N	Valid	369	368	368	46	26
	Missing	36	37	37	359	379
Mean		3.43	3.61	4.16	4.15	4.31
Median		3.00	4.00	4.00	5.00	5.00
Std. Deviation		1.247	1.169	.836	1.074	.928
Minimum		1	1	1	1	2
Maximum		5	5	5	5	5

Source: SPSS V15.0 OUTPUT

Regarding the utilisation of sensitivity analysis, there is support for the view that this risk tool is rarely (almost never) utilised to manage risk associated with IT investments within government departments and government owned institutions. The decision tree analysis and Monte Carlo simulations are never utilised to manage risk associated with IT investments within institutions. These findings are supported by the mean, median and standard deviation information supplied in **TABLE 1.1**.

Statistical tools used in the study

The reliability of a measurement tool is vital in order to ensure that there is consistency in what is being measured. The reliability measurement tool known as Cronbach's alpha is utilised extensively in this study to test the consistency in measurement. According to Cortina (1993:98), a Cronbach's alpha value of 0.7 or greater suggests that the measurement tool is reliable and can be used in a study of this nature. The 0.7 Cronbach's alpha value measure was adopted in this study. Again, a test on the deletion of items was conducted. The intention of this exercise

is to seriously consider deleting the items whose deletion significantly improves Cronbach's alpha.

The analysis of the mean and variance in this study is undertaken using a statistical tool known as the Analysis of Variance (ANOVA). The ANOVA is a technique used to test the hypothesis that the means of several groups within the population are equal (Diamantopoulos & Schlegelmilch, 2000:187). The study considers a one-way ANOVA in which there are three or more groups to be compared representing a single predictor variable. In order to provide proof on the validity of ANOVA findings, the Levene tests and Brown-Forsythe tests were utilised. These tests help to determine whether or not there are differences in the means of various groups.

Obsolescence risk perspective

A Cronbach's alpha reliability test was conducted on the items measuring the institution's ability to deal with the obsolescence risk perspective. A Cronbach's alpha of 0.728 was achieved. This implies that the reliability is acceptable since Cronbach's alpha is greater than 0.7. Given that Cronbach's alpha achieved a level of 0.728, none of the items were deleted, since such deletion would not significantly improve Cronbach's alpha.

TABLE 1.2: ANOVA FINDINGS: ANNUAL IT BUDGET AND OBSOLESCENCE RISK PERSPECTIVE

		Sum of Squares	Df	Mean Square	F	Sig.
mcid Mean – obsolescence risk perspective	Between Groups	1.729	4	.432	2.171	.072
	Within Groups	77.440	389	.199		
	Total	79.169	393			

Source: SPSS V15.0 OUTPUT

In terms of the last column in the above table, there are no statistically significant differences among the groups on the obsolescence risk perspective based on the annual IT

budget.

TABLE 1.3: LEVENE TEST FOR HOMOGENEITY OF VARIANCES

	Levene Statistic	df1	df2	Sig.
mcid Mean – obsolescence risk perspective	1.483	4	389	.206

Source: SPSS V15.0 OUTPUT

In the above table, the Levene test statistic (0.206) for *mcid* is greater than the critical value ($p > .05$), therefore, the results of the ANOVA are confirmed.

TABLE 1.4: BROWN-FORSYTHE ROBUST TESTS OF EQUALITY OF MEANS

		Statistic(a)	df1	df2	Sig.
mcid Mean – obsolescence risk perspective	Brown-Forsythe	2.272	4	153.074	.064

Source: SPSS V15.0 OUTPUT

The above table shows that the Brown-Forsythe test statistic for *mcid* (0.064) is greater than the critical value ($p > .05$); therefore, the results of the ANOVA are confirmed.

Both the Levene test and the Brown-Forsythe robust test confirmed the findings of the ANOVA pertaining to the obsolescence risk perspective, that is, there are no statistically significant differences on the respondents' views on the obsolescence risk perspective.

Cash flow implications perspective

The cash flow implications attributable to IT investments are very crucial when attempting to determine the risk associated with such investments.

The reliability test was conducted on the items chosen to deal with the perspective on cash flow implications. A Cronbach's alpha of 0.790 was achieved. This implies that the reliability is acceptable, since the Cronbach's alpha was greater than 0.7.

TABLE 1.5: ANOVA FINDINGS: ANNUAL IT BUDGET AND CASH FLOW IMPLICATIONS PERSPECTIVE

		Sum of Squares	Df	Mean Square	F	Sig.
mgfc Mean - views on cash flow implications	Between Groups	1.044	4	.261	.935	.443
	Within Groups	105.785	379	.279		
	Total	106.829	383			

Source: SPSS V15.0 OUTPUT

In terms of the last column in the above table, it is evident that there are no statistically significant differences among the groups on the cash flow implications perspective. Significance value on *mgfc* was 0.443 ($p > .05$).

TABLE 1.6: LEVENE TEST FOR HOMOGENEITY OF VARIANCES

	Levene Statistic	df1	df2	Sig.
mgfc Mean - views on cash flow implications	1.916	4	379	.107

Source: SPSS V15.0 OUTPUT

In the above table, the Levene test statistic (0.107) for *mgfc* is greater than the critical value ($p > .05$), therefore, the results of the ANOVA are confirmed.

TABLE 1.7: BROWN-FORSYTHE ROBUST TESTS OF EQUALITY OF MEANS

		Statistic(a)	df1	df2	Sig.
mgfc Mean - views on cash flow implications	Brown-Forsythe	1.096	4	193.656	.360

Source: SPSS V15.0 OUTPUT

The above table shows that the Brown-Forsythe test statistic for *mgfc* (0.360) is greater than the critical value ($p > .05$); therefore, the results of the ANOVA are confirmed.

Both the Levene test and the Brown-Forsythe robust test confirmed the findings of the ANOVA pertaining to the cash flow implications perspective; that is, there are no statistically significant differences on the respondents' views on the cash flow implications perspective.

Anticipated value perspective

There is a need for decision-makers to be able to identify total IT value attributable to IT investments. Franklin (2006:22) endorses the view that IT value will only be realised if the vision of the institution is clearly understood throughout the institution.

A Cronbach's alpha of 0.817 was achieved on the reliability test of the items pertaining to the anticipated value perspective. This implies that the reliability is acceptable, since the Cronbach's alpha is greater than 0.7. Again, a test on the deletion of items was conducted. Given that Cronbach's alpha achieved a value of 0.817, none of the items were deleted since such deletion would not significantly improve Cronbach's alpha.

TABLE 1.8: ANOVA FINDINGS: ANNUAL IT BUDGET AND ANTICIPATED VALUE PERSPECTIVE

		Sum of Squares	Df	Mean Square	F	Sig.
mviia Mean - View on anticipated value perspective	Between Groups	2.081	4	.520	2.678	.032
	Within Groups	72.452	373	.194		
	Total	74.533	377			

Source: SPSS V15.0 OUTPUT

In terms of the last column in the above table, it is evident that there are statistically significant differences among the groups on the anticipated value perspective. Significance value on *mviia* was 0.032 ($p < .05$). In this instance, only the Brown-Forsythe robust test confirmed the findings of the ANOVA. This confirms the view that there are statistically significant differences on the respondents' views on the cash flow implications perspective.

Other stakeholders' perspective

Cronbach's alpha is not applicable, since the items in this perspective relate to the level of involvement of various stakeholders. Again, no ANOVA and other relevant statistical tests were conducted on this perspective.

Bergeron and Berube (1990:14) stated that the involvement, for example, of end users is vital for the efficiency of the IT investment. The risk is minimised when the other stakeholders within the institution are involved in making the decision pertaining to IT investments. In order to determine the level of stakeholder involvement in capital investment decisions pertaining to IT, the following question was asked:

- During the last financial year, how often were each of the following stakeholders involved in evaluating IT projects?

The following **TABLE 1.9** indicates the pattern of the response.

TABLE 1.9: Stakeholder involvement in evaluating IT projects

		Always	Often	Rarely	Never	Don't Know	Total
The IT department	Count	242	118	18	3	12	393
	%	61.6%	30.0%	4.6%	.8%	3.1%	100.0%
The finance department	Count	90	183	71	25	20	389
	%	23.1%	47.0%	18.3%	6.4%	5.1%	100.0%
Internal auditors	Count	53	150	113	44	31	391
	%	13.6%	38.4%	28.9%	11.3%	7.9%	100.0%
External auditors	Count	30	98	123	93	45	389
	%	7.7%	25.2%	31.6%	23.9%	11.6%	100.0%
Procurement department	Count	101	175	58	30	27	391
	%	25.8%	44.8%	14.8%	7.7%	6.9%	100.0%
User departments	Count	77	177	79	25	27	385
	%	20.0%	46.0%	20.5%	6.5%	7.0%	100.0%
Other1	Count	5	11	4	7	12	39
	%	12.8%	28.2%	10.3%	17.9%	30.8%	100.0%
Other2	Count	2	8	2	1	3	16
	%	12.5%	50.0%	12.5%	6.3%	18.8%	100.0%

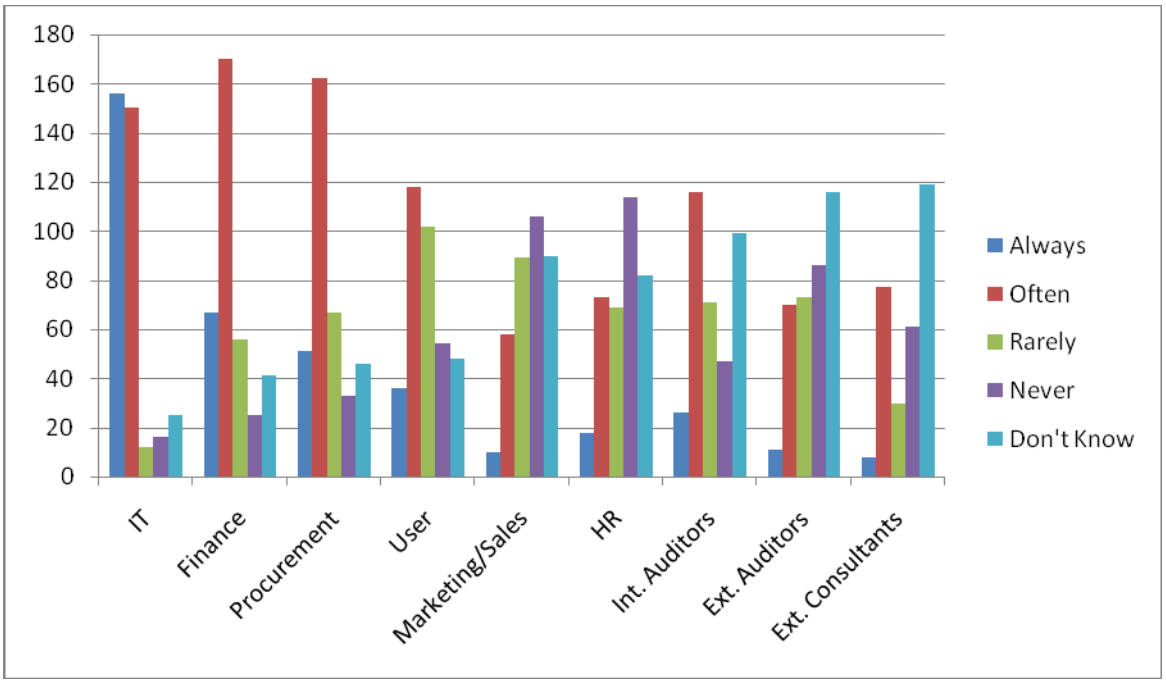
Source: SPSS V15.0 OUTPUT

As indicated in **TABLE 1.9,** 91.6% of respondents indicated that the IT department was involved in evaluating IT projects. Again, respondents indicated that finance departments (70.1%) and procurement departments (70.6%) were the next groups involved with the evaluation of IT projects. The involvement of procurement people justifies the recommendation by Taylor (1990:92) that procurement people need to have diverse skills such as finance, IT, etc in order to succeed in their procurement functions. The user departments ranked fourth in evaluating IT projects, with 66% of the responses indicating that users always or often get involved in evaluating IT projects.

A total of 52% of all valid responses indicated that internal auditors were always or often involved in evaluating IT projects. Only 32.9% of respondents indicated that external auditors always or often get involved in the evaluation of IT projects. Other responses to the above question were ignored due to the insignificance to the results.

The extent to which the various stakeholders within the government departments and various government owned institutions where involved in determining the overall risk associated with IT investments are summarized **in FIGURE 1.2**

FIGURE 1.2: Risk associated with IT investments



Source: SPSS V15.0 OUTPUT

In order to determine the level of stakeholder involvement in determining the risk associated with the IT investment, the following question was asked:

- During the last financial year, to what extent were the following stakeholders involved in determining the risk associated with the IT investment within the institution?

The results indicate that only 43.1% responses believe that end users were involved in determining the risk associated with the IT investments within their institutions. This is the fourth ranking below IT department (85.3%), finance department (66.1%) and procurement department (59.3%). The least involved stakeholders in determining the risk associated with IT investments are external auditors, with 22.8% of the valid responses indicating that external auditors get involved in determining the risk.

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

Conclusion

The study concludes that less than 30% (at most 27.4%) of decision makers within South African government departments and government owned institutions do conduct risk analysis regarding the IT investments. This finding is consistent with the study conducted by Eccles et al. (2004) who concluded that only 30% of the decision makers conduct risk analysis pertaining to IT investments. This low percent of decision makers who bother to conduct risk analysis on IT investments implies that the management of uncertainty associated with the IT investments remains a conundrum within most government departments and government owned institutions.

In spite of the limited decision makers that conduct risk analysis, it is evident that the majority of decision makers changed IT services providers and products over the past 36 months. However; there is no evidence to prove that such changes improved the net value that accrued to the institution. Again, the majority of respondents indicated that they received technology updates from Intel. However, there was no evidence that such information was effectively and efficiently utilized to make a more informed IT investment decision.

An overwhelming majority of respondents indicated that they were able to identify current and future cash flow implications associated with the IT investments. This does not sound ingenuous since it is difficult to ascertain future cash flow implications if the risk associated with such cash flows could not be determined. There is a possibility that IT decision makers deny the existence of the problem associated with the identification of cash inflows and cash outflows associated with IT investments.

Again, a significant majority of respondents indicated that IT personnel clearly understood the institutions' strategic intent as reflected in the vision statement of the institution. However, there was no evidence that such an understanding improved the quality of IT investment decisions. It would be interesting to conduct a further study that determines the impact that an understanding of the vision has on the quality of the IT investment decision.

The study reveals that significant involvement of stakeholders in evaluating IT investments and risk analysis is confined to IT, finance and procurement personnel. It is recommended that the users and other stakeholders such as internal auditors etc should be more involved in evaluating IT investments since the risk associated with such investments is (often) very momentous.

Limitations

The questionnaire did not consist of an exhaustive list of risk tools. Only three risk tools were presented to the respondents. In order to mitigate the impact of limited

risk tools in the questionnaire, respondents were given an option to indicate any other risk tools in their response should they feel that the three tools presented did not reflect the type of risk tools utilised by their institutions.

Again, the inference on the study could only be made to all government departments and government owned institutions that attended the 2009 GovTech conference. The mitigating factor (though) is the fact that this conference is the largest IT conference in South Africa that accommodates most IT decision makers within government departments and institutions.

Even though more than 60% of respondents indicated that they measure the impact of IT investment on the productivity of staff, however, the study did not investigate further how such an impact is measured.

Recommendations

The institution can only determine the net value attributable to an IT investment by referring to three major elements, namely, cost, risk and return. With regard to all the four perspectives in this study, only the perspective on value showed statistically significant differences. This implies that there are huge disagreements among decision makers on the value associated with IT investments. This warrants further research in order to ensure that the decision makers are able to reach some reasonable agreement on whether or not there is value attributable to the IT investment.

The low percentage of decision makers that conduct risk analysis implies that only a few IT decision makers (less than 30%) within government departments and government owned institutions can determine the net value attributable to IT investments. It is recommended that decision makers implement pertinent risk management techniques when evaluating IT investments in order to be able to quantify the value attributable to the IT investment, thus (somehow) resolving the conundrum highlighted in the preceding paragraph.

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