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The Strategic JOURNAL of Business & Change MANAGEMENT
ISSN: 2312-9492 www.strategicjournals.com
Vol. 5, Iss. 2, pp 2533 - 2549, June 28, 2018. www.strategicjournals.com, ©strategic Journals

RISK MANAGEMENT AND PERFORMANCE OF HEALTH SYSTEMS DIGITALIZATION PROJECTS IN PUBLIC HOSPITALS IN NYERI COUNTY, KENYA

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Accepted: June 20, 2018

ABSTRACT

The purpose of this study was to determine the effect of project risk management on performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya. The study used a descriptive research design and targeted sixty five (65) hospital departmental heads from all the five (5) Public Hospitals in Nyeri County. The study targeted all the five public hospitals in Nyeri County and targeted all the sixty five (65) departmental heads. Primary data was collected using questionnaires which were dropped and picked later by the researcher. Secondary data was obtained from corporate handbooks such as hospital's strategic plans as well as a perusal of the financial statements of the hospitals. Descriptive and regression analysis were conducted with the aid of SPSS. There was a significant relationship (F=0.360, P=0.012) between risk management and project performance. Risk management had a strong positive correlation (r=0.899) with project performance. Approximately 80.10% of the variation in the project performance (the dependent variable) was explained by variability in the independent variables. Project risk identification (p=0.032), project risk analysis (p=0.043), project risk response planning (p=0.032) and project risk monitoring and control (p=0.022) were all statistically significant. Project risk identification (β =0.768) was found to the most affecting. It was concluded that project risk management was key to influencing the level of project performance. The study recommended training of staff at all levels on different aspects of project risk management to enhance project performance.

Key Words: *Project risk identification, project risk analysis, project risk response planning, project risk monitoring and control and project performance*

INTRODUCTION

Mobey & Parker (2002) asserts that in order to boost the potential and chance of a proposed project succeeding, it is necessary for the organisation to understand the impending risks. This can be achieved through systematic and quantitative assessment of risks, modelling possible causes and effects, and then selecting appropriate approaches of dealing with the risk exposures. To ensure effective management of all risk exposures, the risk process needs to be explicitly integrated into the business or organisational decision-making process. Cervone (2006) describes risk management as a continuous business process that involves the identification, analysis, evaluation, and treatment of loss exposures as well as an incessant monitoring and control procedure to the risks identified. Burke (2013) posits that Risk Management is a human activity which integrates recognition of risk, risk assessment, development of strategies to manage those exposures, and mitigation of risk using managerial resources. McNeil, Frey, & Embrechts (2015) add that risk management as a business process involves a focused assessment and ascertainment of project viability through feasibility studies, analysing and controlling the potential risks involved in order to minimize loss, planning accordingly in order to alleviate risk and lastly avoiding or suspending projects that are considered too risky yet less profitable and thus enhancing the performance of the projects and that of the organisation.

Ward & Chapman (2003) argue that project risk management involves an informed and thorough identification, assessment, and prioritization of risks and then the application of resources to reduce, monitor, and control the chance and/or impact of ill-fated events or to take full advantage of viable opportunities. Saunders, Cornett, & McGraw (2006) presents some antecedents of loss as financial risks, operational risks such as labour strikes, perimeter risks, strategic risks including management changes or loss of reputation. According to Elkington & Smallman (2002), there exists strong positive association between the amount of risk management undertaken in a project and the level of success of the project or rather the performance of a project. Pennock & Haimes (2002) outlines the basic principles of project risk management arguing that a viable process should create value for the organisation and be tailored to the needs of the business. The process should also take into account human factors involved, besides being transparent and inclusive. It should also be dynamic, interactive and responsive to change. The writer adds that the Risk Management process should be integrated as a function of organization and capable of continual improvement and enhancement and be utilised as a useful tool of decision making. Finally, the Risk Management function should explicitly address uncertainty, be systematic and structured, and based on the best available information.

Digitalization of business and organisational systems has tremendously improved the way businesses operate in their respective industries (Stoneburner, Goguen, & Feringa, 2002). Digitisation of systems not only ensures business survival in the age of intense competition but can also be a key source of competitive advantage. Computerisation ensures a fir achieves better records organisation and makes the staff and businesses more self-sufficient as they can do tasks that were previously outsourced. Computers also increase efficiency in terms of operational costs and allow speedy completion of tasks besides boosting Sales especially through E-Marketing platforms such as hospital websites. The above discussion demystifies why many health care providers have continued to introduce digital systems as a way of enhancing performance.

Nyeri County is among the 47 counties established by the new constitution of 2010 in Kenya and is

situated in the central region Kenya. The county covers an area of 2,475.4 Km2 and borders Laikipia County to the north, Kirinyaga County to the east, Murang'a County to the south, Nyandarua County to the west and Meru County to the northeast. The extremely productive County lies in the Central Highlands and stands approximately 150 km North of Nairobi. Nyeri County stands in the middle of two mountain massifs -the western slopes of Mount Kenya and the eastern base of the Aberdares. The county has five public hospitals namely; Nyeri County Referral (PGH Nyeri) Hospital which is a referral facility situated in Nyeri Town Sub County, Mt. Kenya Sub County Hospital which is a Sub county facility situated in Nyeri Town Sub County, Mukurwe-ini Sub County Hospital which also a Sub county facility located in Mukurwe-ini Sub County, Othaya Sub County Hospital which is a Sub county facility located Othaya Sub County and finally Karatina Sub County Hospital which is again a Sub county facility situated in Mathira Sub County.

Problem Statement

Increased demand for superior services coupled with organizational appetite for reduced operational costs and improved efficiency has led to the introduction of Digitalization projects in businesses with health facilities undertaking projects on introduction of Hospital Information Systems. Ball (2003), observes that in spite of this momentum of change, more than 50% of Information Systems projects fail through the different stages of project cycle. Nyeri County has not been spared either and the administration agrees that there has been numerous drawbacks on implementation leading to poor performance of the projects. Available studies present empirical, methodological and contextual gaps on the need to consider an expanded framework of variables making up the risk management process, the need to shift focus from vendor's perspective to a client's perspective. The study therefore focused on Risk Management and its effect on Performance of Health Systems Digitisation Projects and was considered critical in guiding key policy decisions in IS strategy implementation not only for hospitals but the businesses world at large.

Purpose of the Study

To determine the effect of project risk management on performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya. The objectives of the Study were:-

- To establish the effect of Project Risk Identification on the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.
- To determine the effect of Project Risk Analysis on the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.
- To assess the effect of Project Risk Response Planning on the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.
- To establish the effect of Project Risk Monitoring and Control on the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.

Hypotheses

$H_{01:}$ Project Risk Identification does not have a statistically significant effect on the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.

$H_{02:}$ There is no significant relationship between Project Risk Analysis and the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.

$H_{03:}$ There is no statistically significant effect of Project Risk Response Planning on the performance of health systems

Digitalization projects in public hospitals in Nyeri County of Kenya.

$H_{04:}$ Project Risk Monitoring does not have a statistically significant effect on the performance of health systems Digitalization projects in public hospitals in Nyeri County of Kenya.

LITERATURE REVIEW

Theoretical literature

The study was anchored upon a number of theories which include portfolio theory, network theory and prospect theory. The main guiding theory was however be the Portfolio Theory as applied in project risk management. Norazian, Hamimah, & Ahmad Faris (2008) observe that Portfolio theory of project investment tries to maximize portfolio expected return for a given amount of portfolio risk. Put in other words, it seeks to equivalently minimize risk for a given level of expected return, by carefully choosing optimal project proportions. The concept first originated from Sharpe (1970) but later developed by authors such as De Reyck (2005) who presents the Portfolio Theory as a mathematical formulation of the concept of diversification in investing. The basic aim of the model is the selection of an optimal collection of investment projects that has jointly lower risk than any individual project. With application to project risk management, the portfolio theory allows the analysis of risk sensitivities inherent to each project (Turner, 2014). This then serves as the basis for determining confidence levels across the project portfolio. The assimilation of cost and schedule risk management with methods of establishing contingency and risk response strategies, facilitate business establishments to gain an objective view of a project uncertainties. Technically speaking, the portfolio theory models project performance as being normally distributed. The model presents project risk as the standard deviation of project objectives and models project portfolio as the weighted combination of project. As such, the portfolio theory suggests that the achieved portfolio success is the weighted arrangement of the project performance (Jeffery & Leliveld, 2004). The portfolio theory as applied in project risk management pursues the reduction of the total variance of the portfolio return. The Portfolio theory however makes fundamental assumptions that investors are rational and that markets are efficient

Tatnall and Gilding (2005) fronted wide applicability of the network theory and associated models in project risk management as an integral field in the broad finance discipline. Pryke (2005) describe a network as an abstract structure that captures only the basics of link or association patterns. The fact that networks involve generalized patterns means that tools developed for analysing, modelling and understanding networks can theoretically apply across disciplines. Network theory indicators are often applied to the project risk management field especially in assessment of risk exposures. The basic premise of the network theory is the breaking down of system like economics, society or the environment into a collection of points connected by lines. By so doing, it is then useful in predicting certain outcomes (Cicmil & Hodgson, 2006). The application of network theory tools to risk assessment allows computational limitations to be dealt with which then results to a broader coverage of events with a narrower range of uncertainties. The research at hand is based on network theory to deal with risk assessment and interactions in hospital Digitalization projects in Public hospitals in Nyeri County. As a matter of fact, (Saunders et al., 2006) observes that IS projects are exposed to many mutually supporting risks of various nature, a condition that complicates the process of managing them. The network theory is of great value to the study at hand and is particularly useful in identifying key elements in the project structure and

interrelated risks potentially affecting a project (Pearlson & Saunders, 2004). The process of modelling project risk networks requires the involvement of the project manager and other stakeholders acting in the risk management process.

The prospect theory was first fronted by Kahneman & Tversky (1979) and later developed by the same authors in 1990 more accurate description of decision making, compared to the expected utility theory. The theory presents a behavioural economic model that attempts to explain the approach used by people in making decisions between probabilistic alternatives that involve risk, where the probabilities of outcomes are known. Barberis (2012) presents the basic premise of the prospect theory as the proposition that people value gains and losses differently. As such, people, the theorists posit base decisions on perceived gains rather than perceived losses. This school of thought implies that if a person encounters two equal choices, one expressed in terms of possible gains and the other in possible losses, people would choose the one expressed in terms of potential benefits or gains. According to Abdellaoui, Bleichrodt, & Paraschiv (2007), the prospect theory presents the decision processes as one that involves two stages, the first being editing, where the outcomes of a decision are ordered according to a certain heuristic experience. At this stage, people select the outcomes they consider equivalent, then set a reference point and finally consider lesser outcomes as losses and greater ones as gains. The next evaluation phase sees the people behave as if they would compute a value (utility), on the basis of potential outcomes and their associated probabilities, and then choose the alternative having a greater utility (Wakker, 2010). Project Risk Management involves decision making as an integral process and as such, the theory will find application in the study at hand. The study will guide the Project Risk Identification, Project Risk Analysis, Project Risk Planning and Project Risk Monitoring and Evaluation as key objectives pursued by the study at hand. This is particularly so because these elements of the risk management process involve major decision making scenarios (Larson & Gray, 2011).

Empirical Literature

Project Risk Management and Project Performance

Rabechini and Monteiro (2013) study findings indicated that adopting risk management practices has a significant positive impact on project success. Kishk & Ukaga (2008) study reported that the project schedule overrun of the two projects resulted in huge amounts of lost earnings for the organisation. As such, the study established and concluded that the cause of the projects failure can be directly related to the extent of risk management embarked on. As such, there is strong evidence to state that the level of risk management undertakings during a project impacts directly on the success or otherwise of the project. The researcher recommends that risk management be integrated as part of the project execution and should be evident throughout the project life cycle.

Project Risk Analysis and Project Performance

Kinyua et al. (2015) study findings indicated that an effective risk management practice especially the risk analysis procedures and tools helps the ICT enterprises to identify and quantify risks and aid in developing appropriate control strategies such as risk reduction policies. The researcher identified a statistically significant positive relationship between project risk analysis and ICT project performance for SMEs in Kenya. Didraga (2013) in the study on the role and effects of risk management in IT Projects Success in Romanian IT companies found out that Project Risk Analysis impacts positively on both subjective and objective measures of Project performance.

Project Risk Response Planning and Project Performance

Gitau (2015) indicated that risk management practices at planning stage had an effect on project performance. Findings indicated that most construction projects in Rwanda had some input from a qualified engineer and architect. The study established a strong link between project risk response planning and project performance indicated by both cost and schedule indicators. Didraga (2013) in the documentary review study on the role and effects of risk management in IT Projects Success in Romanian IT companies established a strong link between Project Risk Response Planning and Project performance indicated by both objective and subjective measures. Raz, Shenhar, & Dvir (2002) study established that risk management practices are still not widely used in projects in Israel. As such, just a few projects had used any kind of risk management practices. The study further established existence of a link between risk response planning and project success indicated by process as well as product performance. The study further found out that risk management practices were mostly applied to higher risk projects.

Project Risk Monitoring and Control and Project performance

Jun *et al.* (2011) the findings established that project monitoring and control makes a greater contribution to process performance under low levels of inherent uncertainty. On the other hand, user participation makes a greater contribution to product performance under high levels of inherent uncertainty. Oehmen, Olechowski, Kenley, & Ben-Daya (2014) undertook a study on the effect of risk management practices on the performance of new product development programs. The study was based on a survey of 291 product development programs. Study results indicate that risk management practices are directly associated with three outcome measures namely improved decision making, program stability and problem solving. The findings further established a strong link between monitor and control of risks with project performance. Didraga (2013) established a strong link between Project Risk Monitoring and Control and Project performance indicated by both objective and subjective measures.

METHODOLOGY

The study used a descriptive research design, a choice justified by the fact that the research study aims at describing and elucidating the characteristics associated with the subject population. The study targeted sixty five (65) hospital departmental heads from all the five (5) Public Hospitals in Nyeri County. The study targeted all the five public hospitals in Nyeri County and targeted all the sixty five (65) departmental heads. Primary data was collected using questionnaires which were dropped and picked later by the researcher. Secondary data was obtained from corporate handbooks such as hospital's strategic plans as well as a perusal of the financial statements of the hospitals. The collected data was cleaned, edited and then entered into the Statistical Package for the Social Sciences (SPSS) software (data view) in readiness of the actual analysisThe main inferential statistics were the correlation analysis output, multiple linear regression model and Analysis of Variance (ANOVA) output.

FINDINGS

Descriptive Statistics

Project Performance

The indicators of performance were borrowed from the balance score card and included cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth measures (talent retention and attraction). The mean of the means of all the factors assessed stood

at (4.01) which demonstrated in general, high level of project performance with regard to by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures. The average standard deviation stood at (0.84) and was indicative that the data was held close to the mean affirming the high level of project performance indicated by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures.

Table 1: Project Performance

	N	Min.	Max.	Mean	SD
The project management team is effective in controlling project related costs	50	3.00	5.00	4.1800	.69076
The Project Management team has and follows keenly a clear implementation timeline for the project	50	3.00	5.00	4.3000	.58029
The Project has improved customer service and attracted new clients to the hospital	50	1.00	5.00	3.4800	1.07362
The project has created loyalty among the hospital customers	50	1.00	5.00	4.0600	1.01840
The project has resulted in improved talent acquisition and retention in the workforce	50	2.00	5.00	4.0400	.83201
Valid N (listwise)	50				

Project Risk Identification

Table 2 presented statistics on the level of application of various risk identification tools and techniques for the hospital systems digitization projects. The mean of the means for the application of various project risk identification tools and techniques stood at (3.96). This generally indicated high level of application of risk identification tools and techniques with regard to public hospitals' systems digitization projects in Nyeri County, Kenya.

Table 2: Application of Risk Identification Tools

	N	Min	Max	Mean	STD
Use of risk checklists	50	1.00	5.00	3.5400	1.12866
Use of risk tables	50	2.00	5.00	3.5200	.99468
Application of risk break down structures	50	2.00	5.00	4.0000	.78246
Use of event trees	50	2.00	5.00	3.8600	.83324
Use of defect trees	50	2.00	5.00	3.8600	.72871
Use of brainstorming sessions	50	3.00	5.00	4.4600	.67643
Use of risk profiles	50	3.00	5.00	4.2200	.70826
Use of external consultants (Delphi technique)	50	3.00	5.00	4.2200	.61578
Valid N (listwise)	50				

Table 3 presented statistics on responses regarding the hospital project risk identification condition for the systems digitization projects in various public hospitals in Nyeri County. The mean of the means stood at (3.98) which demonstrated high application of various project risk identification

processes. The average standard deviation stood at a low of (0.65) which demonstrated that the data was held close to the mean further affirming the high level of application of project risk identification processes. Most respondents recommended more stakeholder engagement in project risk management to ensure more productive identification of project risks.

Table 3: Project Risk Identification Conditions

	N	Min.	Max.	Mean	STD
The hospital management created ample awareness to stakeholders before project introduction	50	3	5	4.0800	.75160
The expected impact of the hospital Digitalization project is understood and appreciated by most employees.	50	4	5	4.7600	.43142
Stakeholder concerns about the hospital systems Digitalization project are acted upon promptly	50	2	5	3.7600	1.04119
Project managers are committed in ensuring risks are identified and acted upon in a timely manner.	50	2	5	3.9000	.97416
Screening of project risks and taking appropriate measures influences project schedule performance.	50	1	4	3.1200	.82413
Effective risk identification process enable organization taking correct measures that influence project budget performance.	50	2	5	4.1600	.79179
The tools used by the hospital project managers for risk identification are efficient in discovery of risks.	50	2	5	4.0800	.82906
Valid N (listwise)	50				

Project Risk Analysis

Table 4 presented statistics on the level of application of various risk analysis tools and techniques. The mean of the means of the individual risk analysis tools utilised in the hospital digitisation projects stood at (4.03). This indicated generally a high level of application of the different risk analysis tools available. The average standard deviation stood at a low of (0.89) which indicated that the data on these variables were held close to the mean which underlines the high level of application of the project risk analysis tools.

Table 4: Application of Risk Analysis Tools

	N	Min	Max	Mean	STD
Scenario analysis	50	1	5	3.7600	1.30243
Decision trees	50	3	5	4.4000	.67006
PERT Diagrams	50	3	5	4.4000	.72843
Risk Assessment forms	50	3	5	4.2800	.70102
Risk mapping	50	1	5	3.9200	1.10361
Risk Breakdown Matrix	50	1	5	4.1600	1.05676
Score Analysis	50	2	5	3.9400	.89008

Monte Carlo Simulation	50	3	5	3.3800	.69664
Valid N (listwise)	50				

Table 5 represented statistics regarding the extent to which various risk analysis activities, processes or procedures were undertaken for the hospital digitisation projects. The mean of the means with regard to the various risk analysis processes stood at (3.50) with the average standard deviation standing at a low of (0.80) which represent large application of various risk analysis undertakings with minimal variations of observations from the mean. To make the project risk analysis process more effective, study participants proposed more orientation of stakeholders on this.

Table 5: Project Risk Analysis Condition

	N	Min.	Max.	Mean	Std. Dev
The tools employed by the hospital management in risk analysis in the Hospital Digitalization Project are viable and effective.	50	1	4	3.1800	.80026
The hospital management utilizes both internal and external human resources in risk analysis process.	50	3	5	4.2200	.70826
Risk analysis helps in creating a better understanding of risk impacts in the hospital	50	1	5	4.1000	.88641
The Hospital management conducts both qualitative and quantitative risk analysis with regard to the hospital systems Digitalization project.	50	1	4	2.5000	.78895
Valid N (listwise)	50				

Project Risk Response Planning

Table 6 presented statistics on the extent of application of various project risk response tools and procedures. As indicated by the mean of the means which stood at (4.01), there is generally high application of various tools, procedures and activities pertaining to project risk response planning in the public hospitals in Nyeri County. The average standard deviation stood at factors was (0.94) which demonstrated that the responses were closely held about the mean affirming the condition of wide application of the project risk response planning tools, procedures and activities for the hospital systems digitization projects in public health facilities in Nyeri County.

Table 6: Application of Risk Response Tools

	N	Min.	Max.	Mean	Std. Deviation
Project action plan	50	1	5	3.9400	1.11410
Project brief	50	1	5	3.4800	.95276
Feasibility and viability study	50	1	5	3.7600	.91607
Project life cycle chart	50	1	5	4.2400	.82214
Project specifications	50	1	5	4.5400	1.03431
Programme of work	50	3	5	4.2400	.59109
Labour Schedule	50	1	5	3.8600	1.16075

	N	Min.	Max.	Mean	Std. Deviation
Project action plan	50	1	5	3.9400	1.11410
Project brief	50	1	5	3.4800	.95276
Feasibility and viability study	50	1	5	3.7600	.91607
Project life cycle chart	50	1	5	4.2400	.82214
Project specifications	50	1	5	4.5400	1.03431
Programme of work	50	3	5	4.2400	.59109
Labour Schedule	50	1	5	3.8600	1.16075
Valid N (listwise)	50				

Table 7 presented statistics on the level of application of various risk responses on the hospital systems digitisation projects. The mean of the means with regard to application of various project risk responses stood at (3.88) which indicated that they were applied to a great extent. The average standard deviation for the application of various risk responses stood at (1.02) which indicates that the observations with regard to these responses were closely held to the mean. This further underlined the high level of application of the various risk responses for the hospital systems digitisation project. Involvement of all stakeholders with interest in the hospital digitisation projects was fronted as a key improvement option for the risk response planning in the public hospitals.

Table 7: Application of Project Risk Responses

	N	Min	Max	Mean	Std. Deviation
Risk mitigation	50	1	5	4.1400	1.16075
Risk prevention	50	1	5	3.8400	.79179
Risk avoidance	50	1	5	3.7200	.96975
Risk acceptance	50	3	5	4.1400	.72871
Risk transfer	50	1	5	3.7400	1.20898
Risk out-sourcing	50	1	5	3.7000	1.23305
Valid N (listwise)	50				

Project Risk Monitoring and Control

Table 8 showed the extent to which various risk monitoring and control processes were applied in the hospital digitisation projects for public hospitals in Nyeri County. It is important to note that the means with respect to all the risk monitoring and control processes were all above 4. The mean of the means with regard to the application of these processes stood at (4.33) indicating a wide level of application of project risk monitoring and control processes. The average standard deviation for the individual factors under project risk monitoring and control stood at (0.89) which demonstrated that the observations were largely close to the mean affirming the high application of project risk monitoring and control processes. Improving the frequency with which monitoring and control is

done is outlined as the most viable improvement option to ensure success of the hospital systems digitisation project.

Table 8: Application of Project Risk Monitoring and Control Processes

	N	Min	Max	Mean	Std. Deviation
Risk assessment	50	1	5	4.2800	1.01096
Risk audit	50	3	5	4.5000	.64681
Trend analysis	50	1	5	4.1000	1.05463
Technical performance measurement	50	1	5	4.2600	1.25860
Status meetings	50	4	5	4.5200	.50467
Valid N (listwise)	50				

Regression Analysis

Table 9: Regression Output

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.005	.613		1.611	.007
	Project Risk Identification	.768	.345	.701	2.004	.032
	Project Risk Analysis	.657	.309	.435	2.097	.043
	Project Risk Response Planning	.567	.768	.987	2.970	.032
	Project Risk Monitoring And Control	.342	.223	.336	1.238	.022
R=0.899, R2=0.808, Adjusted R2= 0.801, Std Error, 2.00, F=0.360, Sig=0.012						

a. Dependent Variable: Project Performance

The Coefficient of Determination or adjusted R square stands at 0.801. This essentially meant that 80.10% of the variation in the project performance (the dependent variable) was explained by variability in the independent variables i.e. project risk monitoring and control, project risk response planning, project risk analysis, and project risk identification. As such, only 19.90% of the variation in project performance was explained by other factors not included in the model. At the 5% or 0.05 level of significance, the Analysis of Variance (ANOVA) output delivered evidence to reveal that the slope of the regression line was not zero. This conclusion was reached since the P value of 0.012 was less than 5% level of significance, i.e. p value < 0.05.

From the regression analysis output, all the regression coefficients for the independent variables i.e. project risk identification, project risk analysis, project risk response planning and project risk monitoring and control were statistically significantly different from 0 (zero). This was because their P Values were all less than 0.05. The

coefficient for project risk identification (0.768) was significantly different from 0 because its p-value of 0.032 is less than 5% or 0.05 level of significance. The implication was that a unit increase in project risk identication activities would lead to a 0.768 unit increase in the project performance. The coefficient for project risk anaysis (0.657) was statistically significant since its p-value of 0.043 is less than 5% or 0.05 level of significance. The implication was that a unit increase in project risk analysis activities would lead to a 0.657 unit increase in the project performance of the systems digitization projects in public hospitals in Nyeri County.

DISCUSSION

The study sought to establish the effect of project risk management on the performance of health systems digitisation projects in public hospitals in Nyeri county of Kenya. Specifically, it pursued the determination of the effect of project risk identification, project risk analysis, project risk response planning and project risk monitoring and control on the performance of health systems digitalization projects in public hospitals in Nyeri County of Kenya. The study found that effect that all the independent variables under project risk management are useful predictors of project performance and that they all had a positive effect on project performance. This is in agreement with findings of Draper, Smith, & Pownell (1966) and Seber & Lee (2012), that at least one of the project risk management practices under assessment were useful predictors of project performance. The findings agree with past results by Rabechini and Monteiro (2013) and Kishk & Ukaga (2008) who underline project risk identification as key to project success and recommend integration in to the entire project life cycle. The findings agree with Kinyua et al., (2015) and Didraga (2013) who also found that project risk analysis plays an instrumental role in influencing the level of project success. The results are in agreement with past indications by Gitau (2015), Didraga (2013), and Raz, Shenhar and Dvir (2002) who established that project risk response planning impacts positively on project success. Findings of the study also agree with Jun et al. (2011), Daya (2014) and Didraga (2013) who also found project performance enhancing effects of project risk monitoring and control.

CONCLUSION

From the inferential statistics that allow inferences or generalisations to be made to the entire population, it was concluded that project risk management was key to influencing the level of project performance indicated by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures. On project risk identification, a conclusion is made that project risk identification strongly and positively influences project performance explained by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures. On project risk analysis, the study concludes based on regression analysis results that project risk analysis is a significant predictor of project performance represented by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures.

On project risk response planning, the study concludes that project risk response planning has affects the level of project performance. Further, a conclusion was reached that project risk response planning has a strong, positive relationship with project performance indicated by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures. On project risk monitoring and control, it was concluded that project risk monitoring and control significantly drives the level of project performance.

The analysis informed a conclusion on the existence of a moderate relationship between project risk monitoring and control and project performance as indicated by cost (budget), quality (scope), schedule (time), customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) measures.

RECOMMENDATIONS

The study recommended training of staff at all levels on different aspects of project risk management to further improve the implementation framework in order to ensure time (schedule), scope (quality) and cost (budget) compliance of the hospital systems digitization project while satisfying customer metrics (acquisition and retention), and learning and growth (talent retention and attraction) goals. On project risk identification, the study recommends more stakeholder engagement in project risk management to ensure more productive identification of project risks. Regarding project risk analysis, the study established that the analysis tools utilised were only moderately effective and viable in risk analysis. As such, the project management team should explore ways for enhancing the effectiveness of the tools in risk analysis by providing more orientation of stakeholders on this. On project risk response planning, the study recommends involvement of all stakeholders with interest in the hospital digitisation projects and adoption of a wide range of responses to risks with emphasis on risk prevention. Finally, on project risk monitoring and control, the study recommends that risk be monitored and controlled more frequently to ensure success of the hospital systems digitisation project.

LIMITATIONS OF THE STUDY

There were certain impediments that the researcher encountered in conducting the proposed research. The researcher encountered a non-response situation where the departmental heads, who were the targeted respondents withheld information for fear of unknown or organisational policy on confidentiality. An introduction letter was obtained from the university to dispel fear by the respondents and as a guarantee that the research was purely meant to serve academic purposes. A research permit was also sought from the National Commission for Science and Technology. The researcher also made an ethical commitment to keep all information gathered confidential. This worked well in boosting the response rate.

SUGGESTIONS FOR FURTHER STUDY

Owing to research resource constraints, the study was limited to public hospitals in Nyeri County, Kenya which is just a small fraction of hospital projects in Kenya. The study recommends future studies to cover a larger population such as hospital digitization projects in Kenya. The hospital projects targeted should include both private and public hospitals if within means. As such, a recommendation is made for a study on; the effect of project risk management on project performance for health digitization projects in Kenyan public and private universities. Resources are likely to have a ramification on the manner in which project risk management is conducted. In light of this, the study recommends that future studies focus on the role of resources and organizational capabilities in influencing the implementation of project risk management. A study on; the effect of organizational resources and capabilities on project performance is therefore recommended. Future studies should also consider other projects other than hospital systems digitization projects.

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