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EFFECT OF PROJECT PLANNING ON THE PERFORMANCE OF A ROAD CONSTRUCTION PROJECT: A CASE OF KICUKIRO CENTER-KAGARAMA-MUYANGE ROAD IMPLEMENTED BY NPD LTD IN KICUKIRO DISTRICT, RWANDA

Author: Emmanuel NDIZEYE NKURIKIYINKA
Master of Science in Project Management (MSCPM)
University of Kigali
Co-Author: Dr. Jean De Dieu DUSHIMIMANA

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ABSTRACT: The study investigated the project planning and performance of road construction project specifically the Kicukiro Center-Kagarama-Muyange Road in Rwanda. The study was guided by specific objectives which are to ascertain the effects of scope planning on performance of road construction projects; to determine the effect of resource planning on performance of road construction projects; to determine the effect of Risk planning on performance of road construction projects; and to examine the effect of stakeholders planning on performance of road construction projects. Descriptive and correlative research designs; and the mixed approach of qualitative and quantitative approaches were used. Targeted population was 237 persons. The study had 149 respondents as sample size. Data collection methods were documentary analysis; questionnaire; interview guide; and observations. Descriptive statistic method was used to analyze collected data specifically the frequencies, percentages, mean, and standard deviation. Correlation coefficient; and multiple linear Regression analysis models were adopted. The results showed that there is a positive and strong correlation between Project scope planning and Performance. The findings showed level of f-test model is 228.710 which is positive with p-value of 0.000[b] less than both standard significance levels of 0.05 and 0.01. The study retained alternative hypothesis stated that Ha1 stated that there is a significant effect of resource planning on performance of road construction project; Ha2 said that there are significant effects of scope planning on performance of road construction project; Ha3 stated that there are significant effects of Risk planning on performance of road construction project; and Ha4 said that there are significant effects of stakeholder's involvement on performance of construction projects of Kicukiro Center-Kagarama-Muyange. Kicukiro District.

Key words: project planning; performance; road construction project

INTRODUCTION

In Sub-Saharan Africa, the roads are the main mean of transport, for which the need is growing rapidly. Many of the African countries have accepted institutional reforms, notably entailed the initiation of road funds and road agencies, and made significant progress on road maintenance. There are still challenges to be addressed in order to ensure appropriate maintenance. Poorly maintained roads constrain mobility, significantly raise vehicle operating costs, increase accident rates and their associated human and property costs, and aggravate isolation, poverty, poor health, and illiteracy in rural communities (Hassan, 2018). Time spend on planning helps increase chances of success for the project while lessening risks associated with the project (Wang, Y.-R.; Gibson, G. E., 2018). Other researchers on the effects of project planning practices on project performance such as (Morris, P.W.G., 2020), and (Lianying, Zhang; Weijie, Fan, 2021), found that scanty planning and analysis leads to a failed project, while good planning increases the chances of success of the project. Any projects in developing nations encounter considerable time and cost overruns, fail to realize their intended benefit or even totally terminated and neglected before or after their completion.

In Nigeria 5-10% of government construction pre-contract cost is based on contingency. This has been found inadequate which means extra financial commitments occasionally beyond the capacity of the owner. Clients are sometimes not prepared for this and so fund in terms of loans are sought to offset these additional costs (Al-Moumani, 2020). The systematic improvement in project planning is required to improve the performance of project outcome (Idoko, 2020). The lack of an implemented project plan has caused problems in all project management areas and has made it impossible for the management team to have the required control of project activities (PMI, 2021).
In Ethiopia pointed that most types of projects share many of the problems and challenges that are similarly faced in other developing countries. For example, the studied project reporting document and the survey questionnaire shows that

79.06 % of the project fails to meet its objectives in Ethiopia (Gaba, 2021). Project performance and success in terms of effectiveness measures revealed five major component factors including customer satisfaction, learning and exploitation, stakeholder objectives, user satisfaction and operational assurance (Takim, Roshana; Hamimah, Adnan, 2019). Given that effectiveness project success measures are associated with the projects' results, factors for instance meeting the users and client's satisfaction, learning from projects, meeting pre-stated project stakeholders' objectives and supported by a well-organized commissioning programmes are the expected outcomes of the project. The indicators of proper project performance include; aligning project outcomes with customer needs expectations and specifications (Lauri, Koskela; Greg, Howell, 2021).

In East African Community countries, the performance of road and highway construction projects has been a subject to consider in East African countries particularly Uganda and many countries for quite some time. The problem of underperformance is not only affecting the road construction projects but also the construction industry. Studies show that construction projects and the industry at large have performed poorly in both the developed and under developed countries (Christophe, 2017). Olatunji (2020) in Sudan observed that despite large number of reported cases, construction ranging from the simplest to more complex projects platforms have increasingly experienced cost overruns. This phenomenon is also similarly observed in Ghana wherGaba (2021) observed that studies reveal increase in cost overruns, delayed completion, unsatisfactory and unmet project objectives in most construction projects. According to Richard (2022) one of the main reasons of project 10 failure in Kenya included, is lack of effective planning processes. Similarly, some of the planning processes are neglected in Kenya projects, and the execution of the project is often started without developing project plan or poor project planning.

Rwanda being a landlocked country where internal transportation method is mainly road transport, according to the Annual Report Fiscal Year 2017/2018, Rwanda's road network is classified into national roads (2,749km), District, City of Kigali roads and other urban roads. Class one (3,906km) according to the Ministerial Order No.01/ Cab. M/015 of 3rd March 2015, District roads class 2 (9,706km) and the unclassified roads totaling to about (21,145km). With the exception of national roads, other types of roads are considered feeder roads of which 78% are unpaved and need improvement. Project performance management refers to the process of creating, implementing, and managing projects that gather to the performance of an organization and its strategy. Rather than focusing on task execution, project performance management is about the bigger picture (Jackson T., 2020). Failure of project completion within the timeline is the main challenge in most developing countries, at least 79% of the executed projects fail to meet its objectives due to the lack of preparation, inadequate documentation and tracking, poor leadership, failure to define parameters and enforce them, inexperienced project managers, inaccurate cost estimates, poor communication across teams, culture and ethics at odds, poor resource planning, and disregarding warning signs (Anne M. CarrolL, 2022). The performance problems of project i.e., cost overrun, time delay, quality deficiency is caused by either in selection, planning, execution or control phase of the project and other factors (Sennett, 2012).

Statement of the Problem

Despite the importance of these roads' infrastructure and the billions of dollars committed to them, road projects are never completed on time. Time is money; delays in completing road construction project have significant financial impact to the government, the citizens and the contractor. Failure to complete these road projects on time brings financial and economic issues to the City, severe challenge to vehicular movement, loss of jobs as well as the citizens in the neighborhoods feeling uncomfortable due to dust and noise pollution (Muhirwa S. M. Abedenego O. and Gwaya, T.K., 2019). Road transport sector in Rwanda is promoted through roads construction in all districts, but some roads and bridges are smaller than others in same District, some are not in good condition in different villages in same District, there is a lack of water canalization, for example the road of Zindiro Birembo Gasanze in the villages of Gasabo District which is not built as roads of Kimironko-Gishushu-Nyarutarama roads and Kimironko-Kibagaga Nyarutarama-Giasozi, yet they are all in the same district of Gasabo and these were monitored by same construction agency (Shyirambere, 2020). Kicukiro District performs also better than other parts of the country in areas of electricity, ICT and access to roads are national average. This indicates a strong competitive advantage in terms of creating productive jobs and improved life and wellbeing of its citizens. Kicukiro District Road network is concentrated with tarred roads, stone-paved roads and earth roads. Unfortunately, some roads linking different areas of the district are often in bad conditions and therefore less practicable. Most of these roads are in really bad state and need regular maintenance. Coach stations and parking areas are rare, and also rural areas are faced with serious transport problems (DDP report, 2019).

The study of Kobusingye, M., and Mulyungi (2017) revealed that partners' association in venture commencement, arranging, usage, and audit contributed to the outcome of the result. Belout and Armstrong and Murlis (2014) found that strategies of reward are a significant part of HRM of an organization and ought to be bundled with other HR practices in order that they complement as well as reinforce one another for the purpose. Guoli (2010) found that insufficient cash flow consequence in a project is frequently associated with delays and large extra costs, since there is big threat for a temporary discontinuation of the entire project. The study did not investigate fully the contribution of budget planning on project performance. Lloyd (2013) found that function is defined as the prior planning of the project at any time based on present certainties as well as revised prospects. Therefore, most of the studies reviewed above, have contributed so much to the current study, unfortunately, the authors did not clarify how resources planning; financial resource planning; material usage planning; time schedule and scope planning as factors of project planning each has affected road construction project performance in Rwanda as an indicator of scarce of the empirical studies. This study was conducted to deeply examine the project planning through resources planning; financial resource planning; material usage planning; time schedule and scope

planning in road construction projects on the project performance in Rwanda particularly Kicukiro Center-Kagarama-Muyange Road Implemented by NPD Ltd in Kicukiro District, Rwanda.

Objectives of the Study

The general objective investigated the project planning and performance of road construction project in Rwanda. The study was guided by the following specific objectives:

[1] To assess the effect of scope planning on performance of Kicukiro Center-Kagarama-Muyange Road construction project;
[2] To determine the effect of resource planning on performance of Kicukiro Center-Kagarama-Muyange Road construction project;
[3] To find out the effect of Risk planning on performance of Kicukiro Center-Kagarama-Muyange Road construction project;
[4] To examine the effect of stakeholders planning of Kicukiro Center-Kagarama-Muyange Road construction project

Research Hypotheses:

This study verified the following Alternative Hypotheses:

[1] **Ha1:** There is a significant effect of resource planning on performance of road construction project
[2] **Ha2:** There are significant effects of scope planning on performance of road construction project
[3] **Ha3:** There are significant effects of Risk planning on performance of road construction project
[4] **Ha4:** There are significant effects of stakeholder's involvement on performance of road construction project

Conceptual Literature

1. Project Planning

According to Atkinson, (2019) project planning could be viewed as a system, which is dynamic and ever changing from on stage to another in a life cycle. Thus, each successive model sacrifices methodological rigor, in return from which there are significant reductions in cost and time requirements in project planning (Florin, 2011).

The project planning requires a thoroughly management plan its changes would occur beyond different reasons, for instance in their priori relation or even with post share success. Some could follow good success, and others could have no relation to prior success. In either case, inclusion of such changes biases tests against finding an inverse relation between project planning and project success. (Binnendijk, 2019).

2. Project Scope planning

Project scope is the definition of what expected to achieve and specify the budget of both cost that needs to be provisioned create the project deliverables before the project gets closed, one need for the best result, one needs to take care of clearly carving out project definition the budget requirements (Cho, 2021).

3. Project schedule

Project schedules can also be characterized by their intended uses. Early- phase schedules (more commonly called plans) can be helpful in forging a project execution strategy. Project schedules enjoy their greatest use as tools of communication, coordination, and collaboration. In all cases, project schedules (including precursor plans) are tools of the project manager, intended to optimize their efforts to effectively manage the project (PMI, 2014).

This section debates on the theories useful to current study like the community participation theory, institutional theory and resource-based view theory.

Community Participation Theory

Cohen and Uphoffs (1987) comprehensive model regarding people's participation are chosen to analyze the participation of community level people in development projects in Bangladesh (Cohen and Uphoff, 1987). Community Participation theory propounded by Khwaja (2014) is also consulted and used for the present study. The community participation theory assumes that community participation has a real influence on the decision, that is: greater community participation makes it less likely that the decision is determined by the external agency (Khwaja, A. I., 2014). This assumption and found that it is indeed true higher community participation in a decision also implies a lower likelihood that the external organization rather than the community is identified as the main decision maker. Participation of people is of utmost essence while identifying a project. If their participation is ensured, they can best fit the need, nature and type of project according to their own need as well as challenges and constrains. Moreover, their participation in

4. Project Budgeting Plan

The project budget plan is not just about the people to be involved in the project, rather materials, equipment required for successful completion of the project, having mentioned this, generally budget planning tends to revolve about people/ staffing management. Project quality management must address both the management of the project and the product of the project. Failure to meet quality requirements in either dimension can have serious negative consequences for any or all of the project stakeholders (Darb, 2016).

5. Project Communication Plan

Communication in Project Management the importance of communication in the success of a project is immense. Careful communication planning and setting the right expectations with all the project stakeholders is extremely important. Face to face initial communication within the project team to establish the team dynamics and learning the customer's expectations are the keys to success when starting a project (Kerzner, 2021).

6. Project Performance

Project performance attained through an interrelated group of processes from project planning and management that enables the project team to achieve the instigate goal. These processes manage inputs to and produce outputs from specific activities; the progression from input to output is the nucleus of project success and requires integration and iteration. This progression requires project management acumen, expertise, tools and techniques, including risk management, contingency development, and change control (Amalraj, 2017).

Theoretical Review

project identification and planning swallows the sense of ownership among them which help during the implementation of the projects. In community participation theory, the focuses are given on the participation of beneficiaries, and not that of government personnel in the development projects. The joint or collaborative involvement of beneficiaries in groups is a hallmark of community participation; and that community participation refers to a process and not a product in the sense of sharing project benefits. Community Participation theory stands for the general assumption that the higher the community participation in a decision, the lower the likelihood of the interferences of external organizations on that decision (Munguti, J.M. , 2014). This theory addresses community participation that highly influences acceptance and performance of projects. The theory is a relevant to current study in understanding influence of community participation in the project planning that could influence the performance of road construction projects in Rwanda.

Institutional Theory

Institutional theory is a predominant theoretical tool within the field of organization studies. Institutional theory has its roots in the scholarly understanding of institutions as monolithic, permanent structures invested with socio-cultural meaning, and governing social behaviors. It was initially used in the 1970s to study what were perceived by scholars as the institutional qualities of organizations: their stability, and the rule-like structures they exhibit which shape and constrain members' behaviors (Batchelor, S., McKemey, K. & Scott, N., 2010). Institutional theory was subsequently used to examine how organizations and their behaviors acquired myths and meanings which contribute to formal organizational structure, but which are not able to be understood as the products of organizations' practical demands. The scope of institutional theory has steadily expanded to include its application to the study of how, through institutional pressures, organizations come to resemble each other, how individuals exercise power within institutional environments, and how institutions change. Institutional theorist Roy Suddaby even goes so far as to say that institutional theory has become ubiquitous within organization studies, being applied by default to any and all questions within the field (Suddaby, R., 2010). This theory examines how organizations and their behaviors acquired myths and meanings which contribute to formal organizational structure influence performance. Therefore, it is a relevant to the study in looking the influence of project management especially project planning on the performance of road construction projects in Rwanda.

Resource Based View

The currently dominant view of resource-based theory is based on the concept of economic rent and the view of the company as a collection of capabilities. This view of strategy has a coherence and integrative role that places it well ahead of other mechanisms of strategic decision making (Kay, J., 2015). The resource-based view (RBV) offers critical and fundamental insights into why firms with valuable, rare, inimitable, and well-organized resources may enjoy superior financial performance.

The main contribution of the resource-based view lies in the notion of competitive advantage. The resource-based view of the firm, which envisions firms as a bundle of resources, is probably the dominant theory for explaining differences in performance among firms today (Barney, J. B. &Arikan, A. M., 2011). Resources have been variously defined by RBV theorists, but can include financial capital, assets, human skills/knowledge, organizational processes, and technologies. Despite the varied positioning of early resource-based contributions, each focused on the distinctive resource profiles of heterogeneous firms and the question of why some firms consistently outperform others (Carmeli, A. , 2010).

Kobusingye, Mungatu and Mulyungi (2017) examine on the impact of partners' association on task results an instance of water, sanitation, and cleanliness venture in Rwanda. The reason for this investigation was to assess partners' inclusion in task result, through social affair and

A portion of the most important of the research to shape resource-based thought is rooted in the early research on distinctive competencies, Ricardian economics, and the theory of firm growth proposed since concepts from that historical research influenced the fundamental assumptions of the model. The resource-based view suggests that a firm can create sustainable competitive advantage through developing its unique resources and capability. The difference between providing short-term competitive advantage and that which is sustainable resides in the notion that these resources are heterogeneous in nature and not perfectly mobile (Barney, J. B., 2012). Managers are not static in the RBV, but instead they are called upon to structure, bundle, and leverage their valuable resources in unique ways to maximize their contribution to providing sustained advantage. Literature on the resource-based view already provides resources which contribute to the formulation of sustainability-related strategies, such as continuous improvement, a shared vision within the church-based organizations, high order learning, relationships with external stakeholder's involvement green supply chain management practices, international experience, working capital management skills, organizational slack and political management capabilities. However, this literature emphasizes how these resources affect an organization's environmental or social performance and ultimately its financial sustainability (Sirmon, D. G., Hitt, M. A. & Ireland, R. D. , 2013).

The Resource Based View's lack of clarity regarding its core premise and its lack of any clear boundary impedes fruitful debate. Given the theory's lack of specificity, one can invoke the definition-based or hypothesis-based logic any time. Again, we argue that resources are but one potential source of competitive heterogeneity. Competitive heterogeneity can obtain for reasons other than sticky resources (or capabilities) (Hoopes, D. G. Madsen & Walker, G., 2013). Competitive heterogeneity refers to enduring and systematic performance differences among close competitors. The RBV uses firms' internal characteristics to explain firms' heterogeneity in strategy and performance. A firm is an organized, unique set of factors known as resources and capabilities, and RBV theory cites two related sources of advantages: resources and capabilities. Resources are a firm's accumulated assets, including anything the firm can use to create, produce, and/or offer its products to a market. However, resources are eligible for legal protection as such, firms can exercise property rights over them; can operate independently of firm members; and intervene as factors in the production process to convert input into output that satisfies needs and enhance the performance of road construction projects in Rwanda.

Empirical Review

breaking down the data on the degree of association of partners during the time spent undertaking cycle the executives. The investigation tried to evaluate the association of partner's in arranging, distinguishing proof, execution and conducting audits on task result. This

research used a distinct study plan. The objective populace for this examination was the different partners in the WASH venture in Rwanda and information was gathered from an example of 409 respondents. The essential information was gathered from the network individuals utilizing a semi organized survey, meetings and perceptions. This investigation found that partners' association in venture commencement, arranging, usage, and audit contributed to the outcome of the result. This examination found that partners association in task execution contributed the most to affect the result, followed by undertaking arranging, while ventures recognizable proof had minimal effect on venture results (Kobusingye, Mungatu and Mulyungi, 2017). Belout and Gauvreau (2004) studied the determinants of labor productivity in project performance. Descriptive analysis was used and the study targeted employees of various projects. The study found a positive association between planning of HR and project performance. The study recommended that organizations should put in place worker involvement program, which will enable workers with opportunities to reflect their own work experiences and attitudes, and their own hopes for the future. The study concentrated only on the human inputs but non-human inputs in a project such as finance and material planning were not factored in this study.

According to Wright et al., (2009) the impact of other practices of HR (selection, training, technical expertise, leadership and management style) and project performance participation of 190 US Petro-chemical refineries have been studied. The findings from this study confirmed that there is a direct relationship between selection, training, leadership and management styles with motivation of employees. Nevertheless, the researchers reported that only under highly participative systems, practices of HR (selection, training, leadership and management styles are positively interrelated to project performance of a firm. Huang (2009) studied the influence of human resource management practices on employees' performance (job satisfaction levels, intention to leave, and organizational commitment). The study targeted employees in construction industry. The study found that a company's human resource management practices contribute to increased performance and therefore help it to grow as well as gain sustainable competitive advantage. These researches bade to explain the relationship between human resource management practices and financial performance and sustenance of a competitive advantage in a dynamic environment but did consider the project performance aspects.

Conceptual Framework

The conceptual framework evaluates project planning as independent variables and dependent variables were performance of road construction projects. Figure 1 shows conceptual Framework as in below.

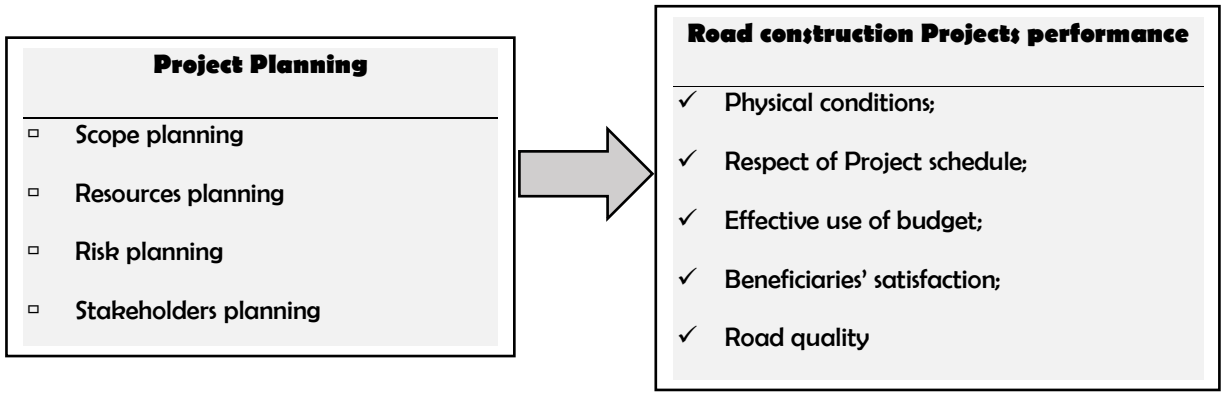

Figure 2.1: Conceptual Framework

Source: Researcher conceptualization (2023)

RESEARCH DESIGN AND METHODS

The study uses descriptive and correlative research designs. The population is homogenous where targeted population is 237 persons involved in Kicukiro Center-Kagarama-Muyange Road Implemented by NPD LTD in Kicukiro District, Rwanda which are categorized into implementers (Engineers, key informants, household consumers, and managers); stakeholders, and beneficiaries of road construction projects of Kicukiro Center-Kagarama-Muyange Road Implemented by NPD LTD in Kicukiro District, Rwanda. A 95% confident level and p=0.5 will be assumed for the equation, where n is the sample size, N is the size of population, and e is the precision level. The sample size is calculated at 95% confidence level, an alpha level of 0.05 which is margin of error of ± 5% and 0.5 as the standard deviation which shows the variance expectation as responses. This study will apply the formula of Taro Yamane as follows:

$$\frac{N}{1 + N(e)^2}$$

$$n= \frac{237}{1+237*(0.05)^2} = 149$$

The current study collected data in 149 respondents from road construction projects of Kicukiro Center-Kagarama-Muyange Road Implemented by NPD LTD in Kicukiro District, Rwanda. To select the respondents, the researcher used stratified and purposive sampling techniques. The study was in three strata and using Purposive sampling technique own judgment when choosing members of population to participate in the study. The researcher used this technique because the people with the knowledge about the matter was chosen to participate in this research. The methods were adopted for collection of necessary and valuable data for this research are mainly drawn from primary data and secondary data. The questionnaire is preferred in primary data because the respondents were free to give answers to the questions. Also, it is encouraging respondents to give open and straight to sensitive questions thus helping the researcher to acquire important information. The questionnaires were in English. The use of questionnaire involves a list of written questions given to certain category of employees. Before the employees start to answer the questions, the researcher had taken time of explaining the questionnaire. The scaling was composed of the following: 1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral, 4=Agree (A) and 5=Strongly Agree (SA). Interview guides outlined issues that a researcher feels are likely to be important. Participants are asked to provide answers in their own words and to raise points they believe are important, so each interview is likely to flow a little differently. In this study, interview was addressed to top management of NPD LTD according to the research objectives of this study. During the study, our own observation of the activities was in road construction projects of Kicukiro-Kagarama-Muyange roads by passing through the roads itself and observing the construction methodologies and results obtained basing on this research objective. The secondary data can be any document written and collected before by other purpose. The research used reports, journals and internet. Data was revealed from documentary review especially textbooks, magazines, internet source, and any other documents that will be deemed necessary and reading books. This technique allowed the researcher to collect data and information from different books, reports, texts and dissertations as well other documents regarding project implementation. One of the main measures for that is proper documentation and transparency of the research procedures. This was ensured by outlining the theoretical framework for analysis, describing the manner of choosing the sample and by providing the questionnaire and primary sources using structured close ended questions are the first occurrence as a point of departure for the empirical investigation. Raw data was transformed into meaningful interpreted report using different techniques. To get quality information, there is generally need for standard checking so that the researcher could end up with realistic data, which clearly reflect the depicted situation. Thus, stand checking was done through editing, coding, and tabulation. This was done in order to reduce detailed data to manageable proportions.

In this study, Statistical Package for the Social Sciences (SPSS) version 23.0, and excel was used by researcher in processing and analysis, of data which inform the presentation of findings, analysis and interpretation. The presentation focused on the research questions, the kind of statistical treatment depends upon the nature of the problem, especially the specific and the nature of data gathered. The data collected was analyzed, with respect to the study objectives, using both descriptive and comparative research design. The tools of analysis were adopted in this study is statistical Package for Social Sciences (SPSS) version 23.0 for descriptive data. The results were presented in form of tables. Descriptive Statistic method was the term given to the analysis of data that helps to describe, show or summarize data in a meaningful way. In addition to descriptive statistics, researcher used multiple regression model and diagnostic tests associate with the test of correlation that examines project planning and the performance of road construction projects of Kicukiro Center-Kagarama-Muyange Road Implemented by NPD Ltd in Kicukiro District, Rwanda.Multiple linear Regression analysis models will be adopted to show relationships using equation econometric models as formulated: $y=f(x)$; $Y=\beta 0+\beta 1X+\beta 2X+\beta 3X+\beta 4X+\varepsilon$, where;

x1: Scope planning
x2: Resources planning
x3: Risk planning
x4: Stakeholders planning
$\beta 0$ is the y-intercept
$\beta 1$-$\beta 4$: are the slopes of the line
ε is an error term

Model Development

Performance of roads construction projects or Y= dependents variable, x_1 –x_4 are independent variables (f) represents the functional notation. This can be specifically stated as: $Y= f (x_1, x_2, x_3, x4)$ ..... (2) where; Y = performance of road construction projects; x1: Scope

planning; x2: Resources planning; x3: Risk planning and x4: Stakeholders planning. The explicit form of equation (i) is represented as: $Y=\beta 0+\beta 1x_1+\beta 2x_2+\beta 3x_3+\beta 4x_4+\varepsilon$... (3). Pearson's correlation analysis is performed on the variables which is used to assess the significance of the project planning and performance of road construction projects in Rwanda. This will be done for each of the independent variables (resources planning; scope planning; risk planning, stakeholders planning) in relation to dependent variable (performance of road construction projects).

DATA ANALYSIS

the findings on data collected for Effect of Project Planning on the Performance of Road Construction Projects especially Kicukiro Center-Kagarama-Muyange Road Implemented by NPD Ltd in Kicukiro District, Rwanda. The results were presented in accordance with the research objectives comprised by the effect of scope planning on performance of Kicukiro Center-Kagarama-Muyange Road construction project; the effect of resource planning on performance of Kicukiro Center-Kagarama-Muyange Road construction project; the effect of Risk planning on performance of Kicukiro Center-Kagarama-Muyange Road construction project; and the effect of stakeholders planning of Kicukiro Center-Kagarama-Muyange Road construction project. Data were gathered from 149 respondents using three weeks of data collection where the findings indicated the participation rate of 100.0% of responding, and data were analyzed quantitatively using computer software of SPSS IBM 23.0 version.

Profile of Respondents

This section contains findings on the age of respondent; gender; level of education; experience in the road projects (years); number of executed road construction projects in the last 10 years; position title in road construction project; experience in road construction project, whether they have ever recorded major variations between cost, time and quality, and the frequently times was done. Findings in table 1 presents socio-demographic characteristics of respondents.

Table 1: Socio-Demographic Characteristics of Respondents

	Data	Frequencies	Percentages
Gender	Male	76	51.0
	Female	73	49.0
	Total	149	100.0
Age	20-29 years	49	32.9
	30-39years	36	24.2
	40-49years	46	30.9
	50-59 years	15	10.1
	60 years and Above	3	2.0
	Total	149	100.0
Education Level	Master's degree and above	7	4.7
	Bachelor's degree	71	47.7
	Diploma	60	40.3
	A2 level	11	7.4
	Total	149	100.0
Experiences	Less than a year	14	9.4
	1-5 years	32	21.5
	5-10 years	75	50.3
	Over 10 years	28	18.8
	Total	149	100.0

Source: Primary data from the field (2023)

The results indicated that among the respondents, majority of respondents were males as it was justified by 76 or 51.0% of respondents who were males while 73 or 49% of respondents were females from NPD LTD in Kicukiro District, Rwanda. Concerning to age of respondents, findings show that majority of respondents met in this survey have between 20-29years old on rate of 32.9%; followed by those who have between 40-49years old who are in rate of 30.9%; while 24.2% of respondents have between 30-39years old; and 10.1% respondents have between 50-59 years. Based on education level, findings revealed that majority of 47.7% respondents have bachelor's degree; followed by 40.3% who have diploma (A1); 4.7% have Master's degree and above while only 7.4% have secondary school level or A2 level. Regarding experience in the road construction projects; majority of 50.3% respondents have between 5-10 years of experiences; 21.5% respondents have between 1-5 years; while 18.8% respondents have experience of Over 10 year

Inferential Statistics Analysis

The relationship between project planning and performance of road construction projects of Kicukiro Center-Kagarama-Muyange determined by the correlation coefficient which is a simple table displays the correlation between the variables; and multiple linear regression analysis showing change in Y when change one unit in X represented by x1: Scope planning; x2: Resources planning; x3: Risk planning; and x4: Stakeholders planning with respectively ε which is standard error.

Normality Test A normality test, also known as a normality check or normality test for data distribution, is a statistical procedure used to determine whether a dataset follows a normal distribution. The normal distribution, also known as the Gaussian distribution or the bell curve, is a symmetrical probability distribution that is characterized by its bell-shaped curve.

Table 2: Case Processing Summary

Details	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Project scope planning	149	100.0%	0	0.0%	149	100.0%
Project resource planning	149	100.0%	0	0.0%	149	100.0%
Project Risk planning	149	100.0%	0	0.0%	149	100.0%
Project stakeholders planning	149	100.0%	0	0.0%	149	100.0%
Performance of road construction projects;	149	100.0%	0	0.0%	149	100.0%

Table 3: Descriptives

			Statistic	Std. Error
Project scope planning	Mean		20.1208	.39667
	95% Confidence Interval for Mean	Lower Bound	19.3369	
		Upper Bound	20.9047	
	5% Trimmed Mean		20.4791	
	Median		22.0000	
	Variance		23.445	
	Std. Deviation		4.84198	
	Minimum		8.00	
	Maximum		25.00	
	Range		17.00	
	Interquartile Range		8.00	
	Skewness		-.816	.199
	Kurtosis		-.311	.395
Project resource planning	Mean		20.7987	.38390
	95% Confidence Interval for Mean	Lower Bound	20.0400	
		Upper Bound	21.5573	
	5% Trimmed Mean		21.2547	
	Median		22.0000	
	Variance		21.959	
	Std. Deviation		4.68606	
	Minimum		8.00	
	Maximum		25.00	
	Range		17.00	
	Interquartile Range		7.00	
	Skewness		-1.186	.199

	Kurtosis		.640	.395
	Mean		21.2081	.40665
	95% Confidence Interval for Mean	Lower Bound	20.4045	
		Upper Bound	22.0116	
	5% Trimmed Mean		21.7353	
	Median		24.0000	
	Variance		24.639	
Project Risk planning	Std. Deviation		4.96375	
	Minimum		7.00	
	Maximum		25.00	
	Range		18.00	
	Interquartile Range		5.00	
	Skewness		-1.345	.199
	Kurtosis		.894	.395
	Mean		29.5705	.56512
	95% Confidence Interval for Mean	Lower Bound	28.4537	
		Upper Bound	30.6872	
	5% Trimmed Mean		30.3087	
	Median		32.0000	
	Variance		47.585	
Project stakeholders planning	Std. Deviation		6.89815	
	Minimum		10.00	
	Maximum		35.00	
	Range		25.00	
	Interquartile Range		7.00	
	Skewness		-1.391	.199
	Kurtosis		1.092	.395
	Mean		32.9597	.66934
	95% Confidence Interval for Mean	Lower Bound	31.6370	
		Upper Bound	34.2824	
	5% Trimmed Mean		33.6409	
	Median		36.0000	
	Variance		66.755	
Performance of road construction projects;	Std. Deviation		8.17038	
	Minimum		12.00	
	Maximum		40.00	
	Range		28.00	
	Interquartile Range		13.50	
	Skewness		-.935	.199
	Kurtosis		-.202	.395

Table 4:Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Project scope planning	.157	149	.000	.878	149	.000
Project resource planning	.185	149	.000	.834	149	.000
Project Risk planning	.227	149	.000	.769	149	.000
Project stakeholders planning	.216	149	.000	.781	149	.000
Performance of road construction projects;	.242	149	.000	.818	149	.000

a. Lilliefors Significance Correction

This output can then be evaluated as follows: The mean and median (as shown in the 'Descriptives' table) are extremely similar. The skewness for Project resource planning is -1.186; Project Risk planning is -1.345; Project stakeholders planning is -1.391; Performance of road construction projects is -.935 (as shown in the 'Descriptives' table), which is well within the acceptable range of -1 to 1. The kurtosis for Project resource planning is -.311; Project Risk planning is .640; Project stakeholders planning is.894; Performance of road construction projects is -.202 (as shown in the 'Descriptives' table), which is within the acceptable range of -1 to 1. The value for the Shapiro-Wilk test is .878; .834; .769; .781 and .818 (as listed under 'Sig.' in the 'Tests of Normality' table), which is greater than .05 as required. The stem and leaf plot is roughly symmetrical. The points do not deviate much from the line in the Normal Q-Q plot, and there are roughly equal number of points above and below the line in the detrended Q-Q plot. The median is approximately in the middle of the box plot, the whiskers are of similar length and there are no outliers.

Correlation Coefficient analysis

Findings indicate correlation coefficient matrix as a table showing correlation coefficients between variables. Each cell in the table shows the correlation between two variables. A correlation matrix is used to summarize data obtained from respondents in road construction projects of Kicukiro Center-Kagarama-Muyange, as input into a more advanced analysis and as a diagnostic for advanced analyses. Table 4.11 shows the findings on correlation coefficient matrix results as follows.

Table 5: Correlation Coefficient matrix analysis

		Project scope planning	Project resource planning	Project Risk planning	Project stakeholders planning	Performance of road construction projects
Project scope planning	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	149				
Project resource planning	Pearson Correlation	.570**	1			
	Sig. (2-tailed)	.000				
	N	149	149			
Project Risk planning	Pearson Correlation	.469**	.865**	1		
	Sig. (2-tailed)	.000	.000			
	N	149	149	149		
Project stakeholders planning	Pearson Correlation	.438**	.723**	.880**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	149	149	149	149	
Performance of road construction projects;	Pearson Correlation	.567**	.812**	.898**	.875**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	149	149	149	149	149

**. Correlation is significant at the 0.01 level (2-tailed).

Source: primary data (2023)

From the correlation matrix test in table 6 results show that there is a positive and strong correlation between Project scope planning and Performance of road construction projects as Pearson correlation is 0.567** with the p-value of 0.000, which is less than standard significance level of 0.01. This indicates that, out of the

considered other factors influence performance of construction projects, only Project scope planning has a significant influence of 56.7% on the performance of construction projects of Kicukiro Center-Kagarama-Muyange. The results show that there is a positive and strong correlation between Project resource planning and performance of construction projects as Pearson correlation is 0.812** with the p-value of 0.000 which is less than standard significance levels of 0.01. This indicates that out of the considered other factors of performance of construction projects; only the Project resource planning has a significant relationship of 81.2% on the performance of construction projects of Kicukiro Center-Kagarama-Muyange. Findings show that there is a positive and strong correlation between Project Risk planning and the performance of construction projects as Pearson correlation is 0.898** with the p-value is 0.000, which is less than standard significance level of 0.01. This indicates that, out of the considered other determinants of the performance of construction projects, only Project Risk planning have significant and positive relationship of 89.8% on the performance of construction projects of Kicukiro Center-Kagarama-Muyange. Findings show that there is a positive and strong correlation between Project stakeholders planning and the performance of construction projects as Pearson correlation is .875** with the p-value is 0.000, which is less than standard significance level of 0.01. This indicates that, out of the considered other factors of the performance of construction projects, only Project stakeholders planning have significant and positive relationship of 87.5% on the performance of construction projects of Kicukiro Center-Kagarama-Muyange.

Regression analysis

Model Summary

The model summary table reports the strength of the relationship between the model and the dependent variable. R., the multiple correlation coefficient, is the relationship. R-squared (R^2) is a statistical measure that represents the proportion of the variance for a dependent variable that's explained by an independent variable or variables in a regression model. linear correlation between the observed and model-predicted values of the dependent variable. Its large value indicates a strong

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.930[a]	.864	.860	3.05463	1.005

a. Predictors: (Constant), Project stakeholders planning, Project scope planning, Project resource planning, Project Risk planning

b. Dependent Variable: Performance of road construction projects;

In order to explain the percentage of variation in the dependent variable (performance of construction projects of Kicukiro Center-Kagarama-Muyange) as explained by the independent variables. Findings in the model summary Table 6 used to explain whether the model is a good predictor. From the results of the analysis, the findings displayed that project planning represented by Project stakeholders planning, Project scope planning, Project resource planning, Project Risk planning which has contributed R=0.930[a] of the variation in performance of construction projects of Kicukiro Center-Kagarama-Muyange as explained by r^2 of 0.864 which indicates 86.4% in the model as positive and strong, as the independent variable highly explained the dependent variable (i.e., performance of construction projects of Kicukiro Center-Kagarama-Muyange) and show that the model is a good prediction. Adjusted R-Square is also 0.860 used as to compensate other factors which are not in the model of this study.

Table 7: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8536.131	4	2134.033	228.710	.000[b]
	Residual	1343.627	144	9.331		
	Total	9879.758	148			

a. Dependent Variable: Performance of road construction projects;

b. Predictors: (Constant), Project stakeholders planning, Project scope planning, Project resource planning, Project Risk planning

The findings in table 7 revealed that the level of significance was 0.000(b) this implies that the regression model is significant in predicting the relationship between project planning and Performance of road construction

projects. The findings showed level of f-test model is 228.710 which is positive with p-value of 0.000[b] less than both standard significance levels of 0.05 and 0.01. This means that, null hypotheses stated that there was rejected and the study retained alternative hypothesis stated that Ha1 stated that there is a significant effect of resource planning on performance of road construction project; Ha2 said that there are significant effects of scope planning on performance of road construction project; Ha3 stated that there are significant effects of Risk planning on performance of road construction project; and Ha4 said that there are significant effects of stakeholder's involvement on performance of construction projects of Kicukiro Center-Kagarama-Muyange,.

Table 8: Coefficient regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.306	1.300		2.543	.002
	Project scope planning	.260	.064	.154	4.084	.000
	Project resource planning	.170	.117	.098	1.450	.003
	Project Risk planning	.676	.150	.411	4.503	.000
	Project stakeholders planning	.445	.078	.376	5.681	.000

a. Dependent Variable: Performance of road construction projects

The results from Table 8 indicated that project scope planning has positive and significant effect on Performance of road construction projects involved at 10% level of significance (β1= 0.260, t= 4.084; p-value= 0.000 less than significant standard level of 10%). This suggests that a 1-unit change project scope planning leads to 0.260-unit change on performance of road construction projects.

The project resource planning has positive and significant effect on performance of road construction projects involved at 10% level of significance (β2= 0.170; t= 1.450 and and p-value= .003 less than 10% as significant standard level). This suggests that a 1-unit change Project resource planning lead to 0.170-unit change on performance of road construction projects. The project risk planning has positive and significant effect on Performance of road construction projects involved at 10% as standard level of significance, as (β3= 0.676, t= 4.503 and p-value = .000 less than 10%). This suggests that a 1-unit change project risk planning leads to 0.676-unit change on performance of road construction projects. The Project stakeholders planning has positive and significant effect on performance of road construction projects involved at 10% level of significance (β4= 0.445; t= 5.681 and p-value= .000 less than than 10% as significant standard level). This suggests that a 1-unit change Project stakeholders planning lead to 0.170-unit change on performance of road construction projects.

CONCLUSION AND RECOMMENDATION

The donors/partners and staff as they play important roles for the achievement of goals/ public purposes. The Kicukiro District should set laws and regulations that facilitate easily the capacity building of staff as they are the human capital read to be developed in a wished manner for performance. They should always increase the budget for training as one source of production expected. Kicukiro District should use efficiently the resource allocated to train their staff about scheduling and planning in general so that its mandate is executed in excellence manner as it is now and be promoted to further stage so that our country Rwanda continue in countries with excellent service delivery among the whole Africa in general and East Africa countries in particular. The donors/partners should recommend more funds based on the efficiency use of the allocated means for training of employees for the capacity building. They should advertise Rwanda all over the world for efficient use of the given fund among other planning activities more especially scheduling. The staff should be serious and take their opportunities of trainings given and others planning activities to improve their capacity in general and the country in particular

Suggestions further Researchers

Due to time constraints, this research was conducted using only one public institution, it is therefore suggested that further research can be conducted in more and different public and private institutions in order to give broader view on the research topic. Again, the current study was based in public sector perception so for further studies should focus in private sector perception for more harmonization into all sectors. Budgeting and HR forecasting are among areas for further development and all are closely associated with planning orientation in any of the sector. Further research should be conducted to see the relationship between those said independent variables to project performance or failure.

BIBLIOGRAPHY

Aggressti& Franklin. (2000). The Art and Science of Learning from Data, Upper Saddle. River, NJ: Prentice Hall.

Al-Ahmadi, H. (2009). Factors Affecting Performance of Hospital Nurses in Riyadh Region, Saudi Arabia. International Journal of Health Care Quality Assurance, 22, 40-54.

Alijanian, A. (2022). The use of indirectness devices in Persian and English argumentative written discourse: A cross-cultural perspective. International Journal of Linguistics, 60-70.

Anne M. CarrolL. (2022). Top 10 Main Causes of Project Failure. https://project-management.com/top-10-main-causes-of-project-failure/restrieved on 22 Many 2023.

Armstrong K. (2003). Job Analysis and Job Design, Human Resource and Personal Management, 4th Edition. India: Tata McGraw-Hill Publishing Company Limited.

Bakker A, Albrecht, & Leiter, M. (2011). Key questions regarding work engagement. . European Journal of Work and Organizational Psychology, 20, 4-28.

Barney, J. B. &Arikan, A. M. (2011). The resource-based view: Origins and implications. In M. A. Hitt, R. E. Freeman, & J. S. Harrison (Eds.), The Blackwell handbook of strategic management (124–188).Malden, MA: Blackwell Publishers Inc.

Barney, J. B. (2012). Gaining and sustaining competitive advantage. Malden, MA: Blackwell Publishers Inc.

Batchelor, S., McKemey, K. & Scott, N. (2010). Exit Strategies for Resettlement of Drought Prone Populations (Project Technical Report). Gamos Ltd: Reading, UK.

Bhandari, P. (2020). What Is Qualitative Research? Methods & Examples. Open access library journal, 5-10.

Carmeli, A. . (2010). High- and low-performance firms: Do they have different profiles of perceived core intangible resources and business environment? Technovation, 21, 661–671.

Ciesielska, M. (2018). Qualitative Methodologies in Organization Studies. sheffield: Sheffield Hallam University.

Cohen and Uphoff. (1987). Community Participation Theory.

Cohen, J. (2013). Statistical Power Analysis for the Behavioral Sciences. Psychology, 19-24.

DDP report. (2019). District development strategy 2018 - 2024 . Kigali: https://knowledge-uclga.org/IMG/pdf/kicukirodistrict.pdf.

Douglas, M., & Elizabeth, P. &. (2012). Introduction to Linear Regression Analysis, 5th Edition. New Jersey: Wiley.

Elisabeth, C., Catherine, C., & Orla, D. (2016). Importance and use of correlational research. Nurse Reseacher, 20-25.

Fatma M. et al. (2018). The relationship between job design and nurses' satisfaction. SOJ Nursing & Health Care.

Grag, P. & Rastogi, R. (2015). A New Model for Job Design: Motivating employee's Performance. Journal of Management Development, 25(6), 572–587.

Grant, A. M. (2017). Relational job design and motivation. . Academy of Management Review, 32(2), 393–417.

Halbesleben. (2010). A meta-analysis of work engagement: Relationships with burnout, demands, resources, and consequences. London: In A. B. Bakker and M. P. Leiter (Eds.), Work engagement: A handbook of essential theory and practice (pp. 102-117). London.

Hoopes, D. G. Madsen & Walker, G. (2013). Guest Editors' Introduction to the Special Issue: Why is There a Resource-Based View? Toward a Theory of Competitive Heterogeneity. Strategic Management Journal; 24,889-902.

Inceoglu, Ilke and Warr, Peter. (2016). Personality and Job Engagement. Journal of Personnel Psychology. . Retreived on February 25, 2013 from: http://www.shef.ac.uk/polopoly_fs/1.157453!/file/Warr_JPP_Personality_and_Engagement_pdf.pdf.

Kay, J. (2015). On being stuck-in-the-middle or good food costs less at Sainsbury, British Journal of Management, March, 19-33.

Khwaja, A. I. (2014). Is Increasing Community Participation Always a Good Thing? Journal of the European Economic Association April–May 2004 2(2–3),427– 436.

Kim, H. J., Shin, K. H., & Swanger, N. (2009). Burnout and engagement: A comparative analysis using the Big Five personality dimensions. . International Journal of Hospitality Management, 28, 96-104.

Kobusingye, Mungatu and Mulyungi. (2017). examine on the impact of partners' association on task results an instance of water, sanitation, and cleanliness (wash) venture in Rwanda.

Lauri, Koskela; Greg, Howell. (2021). Explanation to novel methods. The theory of project management, 1-11.

Leiter, M. P., & Bakker, A. B. (2010). Work engagement: An introduction. In A. B. Bakker and M. P. Leiter (Eds.), Work engagement: A handbook of essential theory and practice (pp. 1-9). . London and New York: Psychology Press.

Lianying, Zhang; Weijie, Fan. (2021). Improving performance of construction projects: A project manager's emotional intelligence approach.

Engineering, Construction and architectural management, 195-207.
Macey, W. H., & Schneider, B. (2018). The meaning of employee engagement. Industrial and Organizational Psychology, 1, 3-30.
Morgan, K. &. (2006). Quantitative Analysis. United Kingdom: John Wiley & Sons.
Morris, P.W.G. (2020). Science, objective knowledge, and the theory of project management. Civil engineering, 82-89.
Muhirwa S. M. Abedenego O. and Gwaya, T.K. (2019). A Management Structure to Reduce Delays in Road Construction Projects of Kigali . International Journal of Innovative Science and Modern Engineering (IJISME).
Munguti, J.M. . (2014). Does Local Knowledge Count in NGO-Driven Community Development Processes? The Case of Participatory Approaches in Water Projects in Kitui District, Kenya. Rotterdam: Erasmus University Rotterdam.
Nyong, A.O. &Kanaroglou, P.S. (2011). Domestic water demand in rural semi-arid northeastern Nigeria: identification of determinants and implications for policy. Environment and Planning 31, 2127–44.
Ostroff, C., & Judge, T. A. (2017). Perspectives on organizational fit. New York:. Erlbaum/Routledge.
Rapley, T. (2007). Doing conversation, discourse and document analysis. London: Sage.
Rich, B. L., Lepine, J. A., & Crawford, E. R. (2020). Job engagement: Antecedents and effects on job performance. Academy of Management Journal, 53, 617-635.
Roberts, Chernyshenko, & Goldberg. (2015). The structure of conscientiousness: An empirical investigation based on seven major personality questionnaires. Personnel Psychology, 58, 103-139.
Sageer, D. S. (2012). Identification of Variables Affecting Employee Satisfaction and their impact on the organization. . IOSR Journal of Business and Management, Volume 5 (Issue 1), 32-39.
Sennett, R. (2012). Together: The Rituals, Pleasures and Politics of Cooperation. New Haven: Yale University Press.
Shirom, A. (2020). Feeling energetic at work: On vigor's antecedents. In A. B. Bakker and M. P. Leiter (Eds.), Work engagement: A handbook of essential theory and practice (pp. 69-84). London and New York: Psychology Press.
Sirmon, D. G., Hitt, M. A. & Ireland, R. D. . (2013). Managing firm resources in dynamic environments to create value: looking inside the black box. Academy of Management Review, 32(1), 273–292.
Smulowitz, S. (2017). The International Encyclopedia of Communication Research Methods. Scranton: The university of Scranton.
Suddaby, R. (2010). Challenges for institutional theory. Journal of Management Inquiry, 19(1), 14-20.
Takim, Roshana; Hamimah, Adnan. (2019). Analysis of Effectiveness Measures of construction project success in Malaysia. Asian Social Science, 47-74.
Taylor, F. W. (2004). The Principles of Scientific Management. . New York, NY: Harper and Brothers.
Wang, Y.-R.; Gibson, G. E. (2018). A study of preproject planning and project success using ann and regression models. The 25th International Symposium on automation and robotics in construction (pp. 688-696). Vilnius: ISARC2008.