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The Effect of Risk Management at Project Planning Phase on Performance of Construction Projects in Pakistan

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ABSTRACT

Purpose: This research/investigation indorses a very good and systematized risk management method throughout planning stage of the project and with the contribution of construction specialists, end users and engineers.

Methodology: The exploration project utilized quantitative examination plan. The examination study was both expressive and illustrative. The examination study was enlightening as it attempts to reaction the topic of what hazard the executives practices ought to be remembered for development projects arranging stage.

Findings: The research study has successfully achieved its objective to identify the impact of risk identification, engineer/architect selection. All four hypotheses were accepted indicating; all the independent variables were positively related to project performance. There is strong positive relation between risk identification, engineer/architect selection and Project performance. There is a weak positive relation between sit selection, preliminary schedule and budget & Project performance.

Implications: The researcher recommends the construction professional to focus on two major things during project planning which has greater impact over project performance, risk identification and engineer/architect selection.

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Introduction

Generally, construction projects consist of four major stages namely initiation / planning, execution, monitoring control and close by. For each stage has its particular distinctive risks. But the jeopardies at construction projects planning stage involves incomplete choice definition, deprived budget and estimates based on partial project information. Further in details during execution, design can have risks

like deprived approximating, poor constructability and possibility tiptoe. The monitoring control stage is often overwhelmed by risks of change orders by client, change control, quality concerns and delays. The risks at closing of projects involves insufficient time for testing and commissioning, snag/punch lists issues, claims etc.

The construction business is one of the major businesses playing its important role to the social and economic development progress (Choge & Muturi, 2013). Kurram Tangi Dam completion date is April 2019 but only 16.17% of physical progress is recorded till October 2018 (WAPDA). The cost estimates of Neelum Jehlum Hydro power project changes frequently.

The development business is one of the significant organizations assuming its significant part to the social and financial improvement progress (Choge & Muturi, 2013). The spending on progress projects in Pakistan for year 2018-2019 is surveyed at Rs 1,152.1 billion Pakistani Rupees, which is generally equal to 19.4% of hard and fast monetary arrangement (Ministry of Finance Pakistan [Budget Brief 2018-2019]).

Literature Review

Risk Identification

Task Risk the executives is 01 of the ninth "information zones" dispersed by the Project Management Institute (PMI) - "Undertaking Management Institute". Project Management Body of Knowledge recognizes the 9th "information territories" particularly for practically all ventures. Risk Management is a troublesome/critical element of the task the board.

Fig 1: Project Risk Management” (PRM) Summary

Risk/Uncertainty is estimated as the fundamental caution for master managing projects, particularly just after the monetary emergency of 2008 that shuddered the world (Junior & Carvalho, 2013). Venture hazard for the most part used to indicate contradicted states of task. (Zhang, 2007). There are no certifications on any task, the most admirably coordinated venture may likewise run into disquiet even the humble movement in the undertaking may transform into unanticipated inconveniences whatever may happen to alter the result of action, it doesn't make a difference how great you plan, your task may consistently meet unexpected entanglements (Parker & Mobey, 2004).

Risks are recognizable as a proof is an iterative cycle all through the venture lifecycle that incorporates the undertaking group, project partners and senior administration influenced by or who may influence the task result of that Risk, and what's more, eventually outside components who can comment on the pattern of the Risk ID dependent on their past encounters (Wysocki, 2004).

Engineer Selection

The choice of the Engineer and Architect in Pakistan is finished as per the Ordinance on open obtainment no PAPRA Ordinance 2002. This law doesn't recognize among the selection of designers and draftsmen from the determination methodology of experts. Quality and cost-based choice (QCBS) of architects is the principle technique.

Fig 2: “Design Process” in Construction Project Management

Specialist choice is positioned as fifth significant reason for development projects disappointment out of thirty-three (33), significant causes distinguished (M. A. Khalid). Most of the time engineer is engaged with configuration period of the tasks and arranging stage can't get esteem contribution from master engineer. Same saw for the situation investigation of first Panama Canal (H. Jeong, John C. Crittenden, & M. X. Messner).

Quality Based Selection (QBS) is reasonable where composite or exceptionally devoted activities, or which have welcome modernizations. The determination of architect is made just on the nature of the venture without impression of the expense. The Public obtainment standard (PPRA 2002, Regulation 10).

“Site Selection” & “Validation

Vital choices are made at the underlying phases of every capital advancement project having key significances for the general achievement of the task. The choice of location upsets the association, the graphic features of a structure; manageability; usefulness; safety; and finally activity & monetary proficiency (GSA, 2001).

Taking choice about the area of a structure site choice is a significant danger the board practice at

arranging stage. Structures are intently connect from the area. The area has a strong impact of building plan and underlying highlights thus far the usage of the task. The dynamic about area of speculation is mind boggling, low organized and multi-measures issue (Jajac, Bilic, & Adjuk, 2013). Site choice is considered as one of the fundamental variables which impacts the undertaking execution in every one of the three viewpoints project time, project cost, project scope. Site determination is positioned as eighth significant reason for development projects disappointment out of thirty-three significant causes distinguished.

Projects Preliminary Budget” & “Schedule

Intended for the advancement of a suitable financial plan for the activities and its booking is a significant stage for the achievement of any development project. Clients and fashioners should be gone to a concurrence on the normal cost at early arranging stage. It is so dubious stage with respect to as the cost the executives cycle is concerned. along these lines a wrong financial plan can prompt small project execution.

It is a typical mix-up at the "arranging stage" to utilize a timetable of lodging with zones and apply some previous expenses without adapting numerous "factors" which upset the development project costs that is the size of undertaking, its area, cost of the task expansions because of the explanation that the “date of the information” was utilized and obtainment strategy simply identical to re-appropriating ("WBDG, 2011”).

Project Time Performance

All the undertaking plan contains a beginning date and end date made arrangements for every movement to be completed in it. Timetable of an undertaking can be spoken to as outline much the same as rundown of expert timetable or achievement plan or can be spoken to in detail. The timetable of undertaking can likewise have spoken to graphically by methods for achievement outlines, histograms, plan network graphs and bar diagrams of the venture. The benchmark of timetable is set up from the organization investigation of the timetable and is perceived / approved by the project director and its group as the pattern with “start dates” & “end dates”. Also the benchmark is a significant segment in supervisory and overseeing project plan.

The exhibition is evaluated utilizing strategies, for example, "SV - plan fluctuation", "SPI-plan execution record" and EVM - procured esteem the executives These techniques backing to gauge the level of "SV - plan change". The "CCM basic chain strategy" relates the amount of support exceptional to the measure of cushion expected to ensure the conveyance date (“PMI, 2008”).

Project Cost Performance

“Cost is very significant factors of a project success throughout the life cycle of project management” (“Azhar., 2008”). (“Gido & Clements,.2003”) expressed expense as the main boundary in venture the board & generally acknowledged in construction industry & writing. “Procured Value Analysis (EVA)” is utilized to examine the cost execution of tasks. Execution results measures are quantitative estimations and fuse such things as, working cost, working entirety, stirring nature and time-to-wrap up (Kerzner, 2009).

It will in general be straightforward or incredibly complex while checking the undertaking cost. In endeavor the heads, one should in like manner consider the yearnings of all assignment accomplices related to cost of undertaking (Gido and Clements, 2003). Execution results measures are quantitative estimations and fuse such things as, working cost, working total, stirring nature and time-to-wrap up (Kerzner, 2009).

Figure 3: Research Framework

H1: “Risk identification “is (+ive) positively correlated with “Project performance/success”.

H2: “Engineer/Architect Selection” is (+ive) positively correlated with “Project performance/success”.

H3: “Site Selection” is (+ive) positively correlated with “Project performance/success”.

H4:” Preliminary Budget and Schedule” are (+ive) positively correlated with “Project performance/success”.

Research Methodology

The exploration project utilized quantitative examination plan. The examination study was both expressive and illustrative. The examination study was enlightening as it attempts to reaction the topic of what hazard the executives practices ought to be remembered for development projects arranging stage. The examination study was illustrative as it attempted to find why such danger the executives rehearses impact the development projects execution.

The examination study is probabilistic rather deterministic. Risk/Danger in the board is in the field of human/social conduct. The entanglement of human/social conduct and the abstract expressive and deliberate segments of human conduct imply that it won't ever be comprehensible to reach at central proclamations that are simply deterministic. The proposed study is configuration to get assessments from project supervisors, counseling professional engineers, designers, amount assessors and temporary workers as for hazard the board and timetable and cost execution in development projects at project arranging stage.

Population of the Research Study

The number of inhabitants in the exploration study comprise of enlisted engineers, project chiefs and experts identified with development industry in Pakistan. The vital customers in development industry are “Water and Power Development Authority” of Pakistan “WAPDA” “Planning and Development” - P&D- “Punjab”, “Sindh”, “KPK”, “Baluchistan”, “Azad Jammu Kashmir” & “Gilgit Baltistan” - AJ&K – GB” & “Irrigation Department throughout in Pakistan”. The essential impermanent labors working in development industry of Pakistan are “Descon Engineering ltd”, “Banu Mukhtar Contracting ltd”, “Frontier Works Organization” and some more. Designers/engineers, project supervisors, and ranking directors working at uber development projects. The zeroed in on people for testing of data incorporates client, authoritative laborer and expert of the going with Projects “Gulpur Hydro Power Project (AJ&K)”, “Kurram Tangi Multi-Purpose Dam (KPK)”, “Guddu Barrage (Punjab)”. “Karot Dam Project (AJ&K)”, “Wind Farm (Sindh)” Six to Twelve Mega Projects of Pakistan's Construction Industry.

Sample Size

(“Hair. 2006”) the choice of sample size is representing of your target respondents effectively as it is difficult for the researcher to get the sample from whole population”. A few analysts feel that example size ought not be minuscule or enormous and ought to be inside reasonable scope of 100 to 200

examples for legitimate information examination. Green (1991)" example size might be distinguished from the quantity of free factors utilized in the exploration study". "(Cohen.,1968)" says that "bigger is better".

"Some of the researchers have developed the rule of thumb for selecting 10-15 samples collection for each independent variable" "(Field 2012)". So consequently, an example size of five to ten super development projects with generally 100 examples was proposed for the exploration study. A sum of 105 reactions were gotten with 100 percent foundation from development industry.

Data Collection Tool for Research

Study method was received for the assortment of information. "Questionnaire was made" available in hard printed designed just as electronically for perpetrator comfort. Guidance with respect to the survey were referenced on it to eliminate any uncertainty. The Questionnaire didn't contain character, individual contact data, data identified with organization privacy so the examination respondents don't feel delay to fill the online survey.

Data Processing and Analysis

Investigation is a community cycle by which answers are concentrated to see whether the outcomes are identified with each exploration question "(Backstrom & Hursh-Cesar, 1981)". Information Examination is a procedure of social event, changing over, approving, and displaying the information with reason for deciding the necessary data. The outcomes so procured are imparted, proposing ends, and supporting dynamic.

Quantitative assessment of data contains the figuring of frequencies of variables and changes between factors. A quantitative approach is normally related with discovering confirmation to either recognize or excuse the theories we have sketched out at the past time of our investigation cycle. Real Package for Social Sciences (SPSS) was used to perform quantitative quantifiable examination for survey. Backslide and relationship tests were performed to investigate the relationship between the independent and ward factors drew in with the assessment study. A Sample size of mega 5 to 10 development projects with generally speaking 100 examples was proposed for the exploration study. A sum of 104 legitimate reactions were gotten with 100% foundation from development industry as appeared in the table underneath.

Table Valid/Missing

N	Valid	104
	Missing	0

Data Analysis Technique for Research

The strategy for data analysis /examination incorporates social affair of the information, its plan, descriptive / unmistakable insights, recurrence measurements and investigation of respondent's socioeconomics, computing unwavering quality measures, and playing out the relationship. SPSS was utilized for the examination. Speculations were checked and tried by applying relapse and connection investigation.

Demographics

Following demography of the participants has been collected from Industry of Pakistan.

- Gender of the participants has been coded Male = 1 and Female = 2.
- Representation has been coded as Client = 1, Consultant = 2, Contractor =3.
- Education level has been coded as Matriculation = 1, Intermediate =2, Bachelors = 3, Masters = 4.

- Project Phase has been coded as Planning = 1, Design = 2, Procurement =3, Construction = 4.
- Industry of respondent has been coded as Infrastructure/Construction = 1, Telecom = 2, Automobile = 3.
- Variables has been coded as Professional Experience = PEx, Current/Last role = CLR, Representative = Rep, Education Level = EduB, Project Phase = PP, Risk Identification= RI, Engineer/Architect Selection = EAS, Site Selection = SS, Preliminary Budget and Schedule = BSD, Project Performance = ProjP

The representation of demographics data has been shown below as Tabular form as well as charts form:

Sample Composition by Professional Experience

The first column includes employees experience in years, the second column shows the frequency of employees in each experience category, third and fourth column shows the percentage (%) and cumulative percentage against each category of work experience.

First category shows the employees with experience range from 1-5 year in construction projects. These are 48(46.2%) of the total sample which is the largest category.

Second category of participants consists of 28 employees having 6-10years of working experience in the construction projects with the percentage of 26.2%.

Third category shows 11-15 years of experience, the total respondent of this category was 9 with 8.7%. There were 20 employees with experience of more than 15 years with 13.2%. The representation of this data has been shown in the table below with the pie chart. The term Professional Experience is coded as PEx for data analysis.

Table : Participants Experience

	Freq	Per%	Valid Per%	Cumulative Per%
0-5	48	46.2	46.2	46.2
6-10	27	26.0	26.0	72.1
11-15	9	8.7	8.7	80.8
>15	20	19.2	19.2	100.0
Total	104	100.0	100.0	

Sample Composition by Education Background

Table highlights the education background of the respondents. Out of 104 respondents 62 (59.6%) of the respondents had an undergraduate (Bachelors) degree while there were 39 (37.5%) had postgraduate (Masters), and only 3(2.9%) respondents were intermediate. The representation of this data has been shown in the table below with the pie chart.

Table : Education level of the respondents

	Freq	Per%%	Valid Per%%	Cumulative Per%%
Intermediate	3	2.9	2.9	2.9
Bachelors	62	59.6	59.6	62.5
Masters	39	37.5	37.5	100.0
Total	104	100.0	100.0	

Importance Attached to Risk Identification

According to the data 67 of the respondents which is 65% of the sample, the risk management process

was formal while it was informal as per 36 of the respondents which is 35% of the sample. The representation of this data is shown below in bar chart as well.

Table - (RI)

"Cronbach's (α)"	"N of Items"
.750	7

Table - (RI)

	'N'	'M i n'	'M a x'	'M e a n'	'St d . De via tio n'	'Ske wne s'	'Kurt osis'
	'S ta ts'	'S ta ts'	'S ta ts'	'S ta ts'	'St ats'	'S ta ts'	'S ta ts'
RI	1 0 3	2. 0 0	5. 0 0	3. 6 6 1 0	.46 91 3	- .4 8 6	2. 0 8 5
V a l i d N	1 0 3						4 7 2

Table shows the results of correlation analysis. As shown in the below table the bivariate correlations among the observed variables risk identification and project performance. There is positive relation exists between risk identification.

The Impact of Engineer and Architect Selection Process

It shows the consequences of dependability test, demonstrations the estimation of "Cronbach's (α)" .757 for the no of things 10 utilized.

Table – EAS

"Cronbach's (α)"	"# of Items"
.757	10

Site Selection

It demonstrates the results of examination for site determination shows the estimation of Cronbach's

unwavering quality adjustable information, which (α) .798 for the no of things.

Table - R- Stats

"Cronbach's (α)"	# of Items
.798	8

Correlations**Table - Co-relations (SS)**

		SS	PRJPER
SS	Pearson Co-relations (PPMCC)	1	.313**

Table - BSD

	"Cronbach's (α)"	# of Items	
	.857	6	
	Sig . (2 – tailed)		.002
	No	101	99
PRJPER	Pearson Co-relations (PPMCC)	.313**	1
	Sig . (2 – tailed)	.002	
	No	99	101

Preliminary Budget and Schedule Development

Demonstrations the aftereffects of dependability test, which displays the estimation of Cronbach's (α) .857 for the no of things 6 utilized:

Summary of Results

Description	Cronbach's Alpha	No of Items
Over All	.759	5(Computed)
Risk Identification	.750	12
Engineer/Architect Selection	.757	10
Site Selection	.798	8
Preliminary Budget and Schedule	.857	6

Descriptive Results

	Mean	Std. Deviation
Variables	Statistic	Statistic
Risk Identification	3.6610	.46913

Engineer Architect Selection	3.6010	.49482
Site Selection	3.4938	.63624
Budget and Schedule Development	3.3013	.59365
Project Performance	3.7401	.80461

Conclusion & Recommendation

The research study shows that the risk identification has positive impact on project performance and therefore acceptance of H1. Engineer/architect selection has strong positive impact on project functionality, cost, time and schedule therefore resulting in acceptance of H2. Similarly, H3 and H4 has weak positive impact on project performance, which are also accepted. The research study has successfully achieved its objective to identify the impact of risk identification, engineer/architect selection. All four hypotheses were accepted indicating; all the independent variables were positively related to project performance. There is strong positive relation between risk identification, engineer/architect selection and Project performance. There is a weak positive relation between site selection, preliminary schedule and budget & Project performance. The researcher recommends the construction professional to focus on two major things during project planning which has greater impact over project performance, risk identification and engineer/architect selection.

References

- Ahmed, A., Kayis, B., & Amornsawadwatana, S. (2007). A review of techniques for risk management in projects. *Benchmark International Journal*, 14(1), 22-36
- Assaf, S., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *International Journal of Project Management*, 24(4), 349-357. Retrieved from
- Carbone, T. A., & Tippet, D. D. (2004). Project Risk Management Using the Project Risk FMEA. *Engineering Management Journal*, 16(4), 28-35. Retrieved from <http://www.fmeainfocentre.com>
- Choge, K. J., & Muturi, W. M. (2014). Factors affecting adherence to cost estimates: A survey of construction projects of Kenya National Highways Authority. *International Journal of Social Sciences and Entrepreneurship*, 1, 689-705.
- Central Development Working Party (CDWP,2018)
- Dvir, D., Raz, T., & Shenhar, A. J. (2003). An empirical analysis of the relationship between project planning and project success. *International journal of project management*, 21(2), 89-95.
- Eskenen, S. D., Tengborg, P., Kampmann, J., & Veicherts, T. H. (2004). Guidelines for tunnelling risk management, *International Tunnelling Association* (19(3)).
- Fageha, M. K., & Aibinu, A. A. (2014). A Procedure for Involving Stakeholders when Measuring ProjectScope Definition Completeness at Pre-project Planning Stage. *AIPM NATIONAL 2014 CONFERENCE PROCEEDINGS*, 1-8. Retrieved from
- Flanagan, R., Norman, G., & Chapman, R. (2006). *Risk management and construction* (2nd ed.). Oxford: Blackwell Publisher
- ICE (2005). *RAMP - Risk Analysis and Management for Projects: A Strategic Framework for Managing Project Risk and its Financial Implications* (2nd ed.). London: Thomas Telford Publishing
- Idoro, G. (2012). Evaluating levels of project planning and their effects on performance in the Nigerian construction industry. *Construction Economics and Building*, 9(2), 39-50
- Kaplan, S. (1997). The words of risk analysis. *Risk Analysis* (17), pp. 407-417.
- Kerzner, H. (2009). *Project Management: A systems approach to planning, scheduling, and controlling* (10th ed.). New Jersey: John Wiley and Sons.
- Gitau LM, 2015.THE EFFECTS OF RISK MANAGEMENT AT PROJECT PLANNING PHASE ON PERFORMANCE OF CONSTRUCTION PROJECTS IN KENYA. A Dissertation of Ms

Thesis.

GSA (2001). The Site Selection Guide (1st ed.). Washington DC: AIA.

Hyunju Jeong, John C. Crittenden, and Ming Xu Messner Meeting on Dec 16, 2009. Panama Canal case study.

Lemma, T. (2014). The role of project planning on project performance in Ethiopia. A Dissertation of MA Thesis.

Morris, P., & Hough, G. H. (1988). The Anatomy of Major Projects: A Study of the Reality of Project Management (1st ed.). New York: Wiley

Murphy, D. C., Baker, B. N., & Fisher, D. (1974). Determinants of project success, Grant No. NGR 22-003-028 for National Aeronautics and Space Administration, Management Institute, School of Management, Boston College, Boston, MA

Olwale, Y. A., & Sung, M. (2010). Inhibiting factors and mitigating measures in practice. Construction Management and Economics, 28, 509-526. Retrieved from http://eprints.aston.ac.uk/15566/2/Cost_and_time_control_inbiting_factors_and_mitigating_measures.pdf

PMI (2018). Project Management Body of Knowledge (PMBOK Guide) (6th ed.) Pennsylvania, USA: Project Management Institute

Parker, D., & Mobey, A. (2004). Action research to explore perceptions of risk in project management. International Journal of Productivity and Performance Management, 53(1), 18-32.

Raz, T., & Michael, E. (2001). Use and benefits of tools for project risk management. International journal of project management, 19(1), 9-17.

Regulation, 2010 for Procurement of Consultancy Services..

State Bank of Pakistan (SBP) 2018, third quarterly report.

Wallace, P., & Blumkin, M. (2007). Major Construction Projects: Improving Governance and Managing Risks. Retrieved from www.deloitte.com

Wang, S. Q., Dulaimi, M. F., & Aguria, M. Y. (2004). Risk Management Framework for Construction Projects in Developing Countries. Construction Management Economics, 22(3), 237-252.

WAPDA Progress report, 2018 <http://www.wapda.gov.pk/index.php/projects/hydro-power/under-construction/kurram-tangi-dam>

Zhang, H. (2007). A redefinition of the project risk process: Using vulnerability to open up the event-consequence link. International journal of project management, 25(7), 694- 701.

Zhou, P. X., Zhang, G. M., & Wang, J. (2007). Understanding the Key Risks in Construction Projects in China. International Journal of Project Management, 25, 601-614.