



## Critical Variables Influencing Project Performance in Real Estate Building Construction Sectors in Ethiopia, East Africa

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**ABSTRACT:** This research paper aims to find the critical variables that influence project performance in Real Estate construction sectors. There searchers developed a new theoretical framework, developed and tested six hypotheses. For this, six independent variables (Personnel Factors PERF, Technical Factors TECF, Administrators Factor ADMF, Material and Infrastructure Factors MINF, Organizational Culture Factors ORCF and Project Management Factors PRMF) and one dependent variable Project Performance Factors (PSF) were identified. Data were gathered by self-administered structured questionnaire from different personnel including project managers, supervisors, Forman and site project managers of the selected Real Estate construction sectors. Totally 137 questionnaires were distributed of them 117 were properly filled and returned for analysis showing 85.40% of response rate. The result of the research indicated that the six independent input factors explained 78.9% of project success factors and three input factors (PERF, ADMF and PRME) were identified that influences project performance in Real Estate construction sectors.

**Keyword:** Project, Project Performance, Input Factors, Dependent Variables, Critical Variables, Real Estate.

### I. INTRODUCTION

Project is defined as temporary endeavor, undertaken to create unique product or service it carried out following specific cycle of Initiation, Definition, Planning, execution and Close, or it results via different organization and coordination of material, financial and individual resources [1]. And according to [2] project has a defined scope, is restricted by limited resource such as time and budget, it uses people with different knowledge and skill. It plays an important role for the sustainable development of the country; it can generate additional capital for confirming the flow of goods and services to the economy.

To improve the socio-economic condition of the community a great amount of money were allocated for projects like: transportation, infrastructure, construction, software and manufacturing. Regardless of several types of project it plays a critical and important role for the development and economy of any developing countries, its performance is still remains generally poor. As [3] noted a lot of projects in undeveloped nations, confront considerable schedule and budget extensions, fail to accomplish the intended objective. Similarly, projects in Ethiopia were the study is conducted shares similar challenge and problems with other developing countries. For example according to our previous study [4] 79.1 % of the construction project fails to meet its objectives in Ethiopia and if completed it is with an average cost overrun of more than 26.2%. If the project runs over the schedule, it needs additional capital and this consumes more material and use extra labor, machinery and equipment. And this additional capital and resource influence the budget of other projects; it affects the economy of the country and results in dissatisfaction of the society or customers at large. Given the key role the project plays in Ethiopia and

other developing countries, and the weak performance of the project, improving and identifying the performance of the project ought to be the first action. This study is intended to identify the key determinant variables that affect the success of project. According to [5, 6] project success was measured based on time, cost and quality; [7] also included psychosocial outcomes, interpersonal relations with project team members and customer satisfaction as project success measuring variables. Based on the evidence of reviewed literatures these project success factors were influenced or affected by different types of input factors.

According to [8] a higher capability (knowledge and experience) of workforce in project group is significantly related with planning which intern affects project success. The finding of [9] denoted that Project team member's practice, commitment, knowledge and social relationship are ranked as very important variables that related with planning performance, which intern leads for Project Successes.

According to the study of [10] the ability of project manager plays an important role for the success of project performance. [11] Confirmed that the higher the level of confidence that customers have in the project manager and project group, the more likely the project will be successful. [10, 12] also pointed out that utilizing and using appropriate methods and efficient techniques like Gantt chart and project management software in project management planning process could increase the possibility of project success. The study by [13], Identified management or administrators approach and availability of resource as important factors of planning and that influence project performance. According to [14] poor plans; poor resources allocation, failure to communicate with the customer and lack of management support were identified as high risk factor for project failure. As stated by [15], one of the common

reasons for project failure was lack of management participation and assistance in planning stage. [16] identified the main project failure variables as lack of user participation, top-down management style and poor internal communication.

In the research of [17] an important relationship between project objective and management support in planning stage was identified as the success factors of the project. In summary, Administrators factors affecting project result includes: management support, the role of top management and participation of different department. The allocation of resources for the project is the second factor affecting project outcomes. Other aspects include project objectives and scope, management styles and communication.

And also different studies identified material and infrastructure factors that affect project performance, scarcity or shortage in infrastructure, mainly supply of resources [18]; lack of effective interaction and infrastructure [19]; design errors, customer liability, project specification and direct change order by customer [20]; Shop drawings, delay in contractors payments, cash-flow problems during construction, design changes, slow decision making, labor shortage and insufficient labor skills [21]; customer financial problem and promised relationships [22] and user changes, weather, site conditions, late deliveries and economic conditions [23].

This study also identified organizational culture from the literature review as one of the determinant factors affecting project performance.

According to [24] Organizational culture is the administrative beliefs and principles of workers on how work is done in the firm.

Organizational culture impacts:- the success rate of a project in different ways; department in terms of their levels of support and interaction in the pursuit of stated goals, the process involved in allocating resources to projects and it affects the performance evaluation of groups and the outcome of the project done by managers [25].

According to [26] there is an encouraging interaction between the organization culture and project performance. An Organizational culture has an important impact on its performance and achievement [25]. [27] Found that diversity, communication and leadership positively influence project performance. According to the finding of [28], there is an important relationship between organizational culture and project performance. Additionally, construction project organization is operated by different types of personal characters with variety of backgrounds, causing different human behavior and different expectations for a project. Hence, those involved individuals who come with complicated behaviors and attitudes significantly influence the success of project.

It is also considered that cultural differences can create conflicts concerning to individual communication which reduce the capacity of construction organizations to achieve project objectives [29, 30].

The study by [31] carried out on Nestle Nigeria private limited company identified the important relationship between organizational culture and project outcome.

Similarly the study identified project management related factors like project planning knowledge areas, Project Communication Management, Project risk management, time management and project cost management that affects project performance. The result of different studies indicated that the importance of project planning on project success; it plays a vital role for project success [32-34, 15]; a well set project plan plays a vital role in project success [33, 35-37]

According to [38] Planning allows the project team to address different factors of success parameters and supportability that determine project success or failure. Project Communication Management is the fuel that keeps the project running efficiently to complete in time, with budgeted cost and with specification according to planed quality [49]. According to different scholars and practitioners, failure to communicate is often the greatest threat to the success of projects.

According to [39, 40] Project risk management factors are very critical for the project success or failures. The Contribution of time management for overall success of the project was 92% [41].

From the above discussion this research paper were categorized key input factors that affecting project success or performance as Personnel Factor (PERF), Administrators Factor(ADMF), Technological Factors (TECF), Material and Infrastructure Factors (MINF), Organizational Culture Factors (ORCF), Project Management Factors (PRMF).

## II. THEORETICAL FRAMEWORK

The researchers developed theoretical frame for identifying the key determinant or critical factors affecting project outcome. The developed theoretical framework considers the relationship between six independent variables (PERF, TECF, ADMF, MINF, ORCF and PRMF) and with the four project success measuring factors (PSF) (Quality, Schedule, Budget and Stakeholder Satisfaction).

**Hypothesis Development:** The following six research hypotheses were hypothesized based on the theoretical framework to test the effects of predictor variables on project performance outcome.

H1: Personnel Factor has a positive and significant influence on project performance outcome

H2: Administrators Factor has a positive and significant influence on project performance outcome

H3: Technical Factor has a positive and significant influence on project performance outcome

H4: Organizational Culture Factor has a positive and significant influence on project performance outcome

H5: Project Management Factor has a positive and significant influence on project performance outcome

H6: Material and Infrastructure Factor has a positive and significant influence on project performance outcome

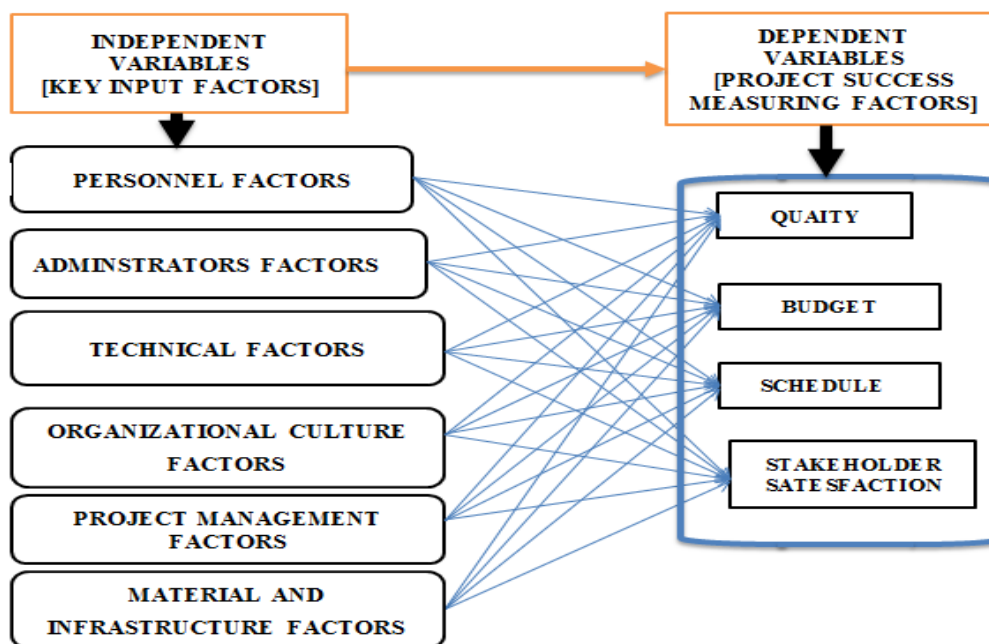


Fig. 1. Theoretical Framework developed by the researchers.

### III. RESEARCH METHODOLOGY

#### A. Research Design, Target Respondent and Response Rate

This research paper used both descriptive and inferential statistic for analyzing the collected data's. The researcher was distributed self-administered structured questionnaire to the respondent. For the purposes of this study, totally 137 questionnaires were prepared and randomly distributed to Real Estate construction sectors, which were registered in Ethiopia. All project managers, supervisors, Forman and site project managers from the selected construction sectors were participated for filling and responding the questionnaires. From the distributed 137 questionnaires, 117(85.4%) of the papers were filled and returned.

#### B. Data Collection and Analysis Tools

The survey quantitative questionnaire was used as the main primary data gathering instrument in this research paper. The questionnaire used a 5 point Likert scale ranging as 1 for Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 for Agree, 5 for strongly Agree, having 65 items under Six independent variables (PERF, TECF, ADMF, MINF, ORCF and PRMF) and 8 items under

dependent variables (PSF). Correlation Strength Interval and Mean Measuring Scale were developed for descriptive and Pearson's Correlation analysis as shown in Table 1. Data was analyzed using correlation and regression analysis.

Table 1: Correlation Strength Interval.

Value	Strength of relationship
$1.0 < r < 0.5$	STRONG
$0.3 < r < 0.5$	MODERATE
$0.1 < r < 0.3$	WEAK
$0.0 < r < 0.1$	VERY WEAK

### IV. DATA ANALYSIS

#### A. Reliability analysis

This research paper used reliability analysis to test the reliability and stability of the research questionnaires. The researcher tested the reliability of the questionnaire by using SPSS version 20. Tables 2 shows the reliability result of the questionnaire before and after some of the questionnaires were removed. As per the result of the analysis after some items are deleted the value of Cronbach's alpha ( $\alpha$ ) was fall from 0.745 to 0.911, which indicated higher reliability of the questionnaire.

Table 2: Result of Reliability Analysis.

Elements	#item Before and After deleted	$\alpha$ - value Before item deleted	$\alpha$ -value After item deleted
Personnel Factors (PERF)	8[5]	0.784	0.864
Technical Factors (TECF)	7[7]	0.718	0.781
Administrators Factor (ADMF)	7[5]	0.773	0.801
Material And Infrastructure Factors (MINF)	15[11]	0.716	0.745
Organizational Culture Factors (ORCF)	28[22]	0.868	0.911
Project Management Factors (PRMF)	22[17]	0.822	0.863
Project Performance(Success) Factors (PSF)	10[8]	0.818	0.853

**Correlation Analysis:** This research paper used Correlation Analysis to examine the strength of the relationship between independent input factors (PERF, TECF, ADMF, MINF, ORCF and PRMF) and project success factors (PSF). The result in Table 4 indicated that PRMF( $r= 0.817, p<0.05$ ), PERF( $r= 0.640, p<0.05$ ) and TECF( $r= 0.634, p<0.05$ ) have strong positive impact on project performance. While MINF( $r= 0.492, p<0.05$ ) and ADMF ( $r= 0.298, p<0.01$ ) have moderate and weak positive impact on project performance respectively. On the other hand the result in Table 5 indicated that ORFM ( $r= -0.113, p= 0.226$ ) has negative and non-significant impact on project performance.

**Regression Analysis:** The research paper used regression analysis for assessing the appropriateness of the model and to investigate fundamental relationship

between independent input factors (PERF, TECF, ADMF, MINF, ORCF and PRMF) and project success factors (PSF).

The result in Table 3 confirmed that the identified six independent input factors variable (PERF, TECF, ADMF, MINF, ORCF and PRMF) accounted for 78.9% of the variation in project success factors (PSF) and the rest 21.1% are unidentified variables by this research paper. The result of model 2 indicated in Table 4 revealed that the importance of the model by the value of  $F$ -statistics ( $p = 0.000$ ), and  $F = 83.068$  which indicated that there were strong relationship between project success factors (PSF) and the independent input factors (PERF, TECF, ADMF, MINF, ORCF and PRMF) in the study sectors.

**Table 3: Result of Model Summary and ANOVA.**

MODEL SUMMARY	RESULT		ANOVA RESULT	Sum of Squares	df	Mean Square	F	Sig.	
	R	.888		Regression	61.951	5	12.390	83.068	0.000
	R <sup>2</sup>	.789		Residual	16.556	111	0.149		
	Adjusted R <sup>2</sup>	.780		Total	78.507	116			
	Std. Error of the Estimate	.3862		a. Dependent Variable: PSFM b. Predictors: (Constant), PRMEM, ADMFM, PERFM, TECFM, MINFM					
	R <sup>2</sup> Change	.789							
Predictors: (Constant), PRMEM, ADMFM, PERFM, TECFM, MINFM (Sig.=0.000)									

As shown in Table 4  $\beta$  sign of three independent input variables (PERFM, ADMFM and PRMEM) confirmed positive influence on project success factors (PSF). While, the remaining input variables have negative influence on project performance. The result of this regression analysis confirmed that PERFM, ADMFM and PRMEM affect the performance of project success factor or outcome.

**Hypothesis Testing:** The developed hypothesis was tested by regression analysis and is used to examine the contributions of independent input factors (PERF, TECF, ADMF, MINF, ORCF and PRMF) on project success factors (PSF).

**H1:** Personnel Factor has a positive and significant influence on project performance outcome.

The result in Table 4 indicated a positive and significant influence of PERF on project performance outcome (PSF) ( $\beta = 0.448; p=0.000$ ), hypothesis1 is accepted.

**H2:** Administrators Factor has a positive and significant influence on project performance outcome

The result in Table 4 indicated a positive and significant influence of ADMF on project performance outcome (PSF) ( $\beta = 0.128.; p=0.029$ ), hypothesis2 is accepted

**H3:** Technical Factor has a positive and significant influence on project performance outcome

The result in Table 4 indicated that Technical Factor has no statistical significant influence on project performance outcome ( $\beta = -0.117, p=0.098$ ). This result revealed that no important relationship between TECF and PSF. Hypothesis 3 is rejected

**H4:** Organizational Culture Factor has a positive and significant influence on project performance outcome.

The result in Table 4 indicated a positive and non-significant influence of Organizational Culture Factor on project performance outcome (PSF) ( $\beta = 0.008; p=0.901$ ).This result revealed that no important relationship between ORCF and PSF. Hypothesis 4 is rejected

**H5:** Project Management Factor has a positive and significant influence on project performance outcome

The result in Table 4 indicated a positive and significant influence of PRMEM on project performance outcome (PSF) ( $\beta = 0.942.; p=0.000$ ), hypothesis 5 is accepted

**H6:** Material And Infrastructure Factor has a positive and significant influence on project performance outcome

The result in Table 4 indicated that Material and Infrastructure Factor has no statistical significant influence on project performance outcome ( $\beta = -0.240, p=0.014$ ). This result revealed that no important relationship between MINFM and PSF. Hypothesis 6 is rejected.



**Table 4: Result of Correlations and regression.**

Correlation		Regression Result			
Between Dependent and Independents Variables	Results		Unstandardized Coefficients (β)	standardized Coefficients (β)	Sig.
		Constant			
PSFM==> PERFM	(r= 0.640 <sup>**</sup> , p=0.000)	PERFM	<b>0.448</b>	<b>0.461</b>	0.000
PSFM==> TERFM	(r= 0.634 <sup>*</sup> , p=0.000)	TECFM	-0.117	-0.116	0.098
PSFM==> ADMFM	(r= 0.298 <sup>*</sup> , p=0.001)	ADMFM	<b>0.128</b>	<b>0.128</b>	0.029
PSFM==> MINFM	(r= 0.492 <sup>*</sup> , p=0.000)	MINFM	-0.240	-0.182	0.014
PSFM==> ORFM	(r= -0.113, p= 0.226)	ORFM	0.008	0.007	0.901
PSFM==> PRMEM	(r= 0.817 <sup>*</sup> , p=0.000)	PRMEM	<b>0.942</b>	<b>0.757</b>	0.000
		<b>Dependent Variable: PSFM</b>			

\*\* is significant at the 1% and\* is significant at the 5%

**V. CONCLUSION**

From the developed theoretical framework k the researcher identified critical input variables that influence project performance in Real Estate Construction Sectors by testing the developed hypothesis and correlation analysis. The influential input factors of project performance were explained by six independent variables (PERF, TECF, ADMF, MINF, ORCF and PRMF) that accounted for 78.1% of the variation in PSF. The regression analysis revealed that the success of project performance will be improved when there will be favorable condition in PERF, ADMF and PRMF. The Correlation analysis result of the study identified that five input variables (PERF, TERF, ADMF and PRME) have direct and significant influence on project success factors (PSF).

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