

# EXAMINING THE RELATIONSHIP BETWEEN PROJECT LEADERSHIP PROJECT TYPE PROJECT CULTURE AND PROJECT SUCCESS: AN EMPIRICAL EVIDENCE FROM SUDAN.

Dr. Abubakr Fedail

## Keywords

Project culture, Project leadership, Project success, Project type.

## ABSTRACT

This study aims to examine the relationship between project leadership, project type, project culture, and project success. Survey-based research using a self-administered questionnaire was conducted with 173 project managers working in different organizations from various Sudanese business sectors, whereas the snowball sampling technique has been used to reach out to the target population. Both, leadership and project culture were found to be statistically significantly related to project success. Furthermore, project culture and project type have proven to be moderators in the relationship between project leadership and project success. Such findings identifying the nature of project leadership's contribution to project success and revealing the role of project type and project culture in project success provide the business era with guidance on the proper project success models and enlighten many dark holes in project management learning and practice.

## 1. Introduction

### 1.1. Project Success

Defining and measuring project success is still a multifaceted issue in literature. On one hand, many scholars, for instance (C. Besner & B. Hobbs, 2006, Joslin & Müller, 2016) argued that, it is too difficult to determine whether or not a project is successful, as this issue is still complicated. Others contend that, project success is a combination of cost, schedule, scope, and achievement of technical and functional requirements and project objectives (Prabhakar, 2008, Laurie Levy, 2020). While others take the position that, project success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction (PMBOK, 2017, Dvir et al., 2006, Müller, & Turner, 2010). On the other hand, many studies separate between project success and project management success, they conclude that project success is measured by meeting the overall project objectives and project management success is measured by meeting time, cost, and quality requirements (Brown, et al., 2007 cited in Yakhchali & Farsani, 2013). A third point of view exemplified by other scholars who focus on the role of project type and believe that different combinations of success criteria are required for different types of projects (W.C. Ibbs, and Y.H. Kwak, 1997, Westerveld-2003-cited in Yakhchali & Farsani, 2013).

One illustration of this debatable issue could be the amount of subjectivity encompassed by the project success, (Ika, 2009) point to the subjectivity of the project success while (Müller & Jugdev, 2012) described project success as "predominately in the eyes of beholder" meaning one stakeholder may consider a project successful, where another stakeholder would consider it a failure and to reduce the subjectivity relating to project success, a common understanding is required. The most dominant approach in measuring project success inspired by (Anton de Wit, 1988) who recommended to distinguish between project success and project management success, i.e. to take in consideration the objective measure (time, cost and quality) as well as the subjective measures (stakeholders' satisfaction) which adopted by many scholars e.g. (Blaskovics, 2016, Narayanaswamy et al. 2013, Sicotte & Langley, 2000 and Hoegl & Parboteeah, 2007). Along the same lines, (Bryde, 2008) asserted the usefulness of this approach by suggesting two groupings of objective measures (e.g. cost, time and quality) and subjective measures (e.g. stakeholders, users satisfaction).

## 1.2. Project leadership and project success

Contemporary business organizations use projects as the main instrument to deliver business value and stay competitive within the high complex and uncertain environment. However, global research has shown that significant amount of projects fails for different reasons, one of the major reasons is poor leadership of the project. Many scholars of project management define effective project leadership as the most critical element for projects to be delivered successfully (Jiang, Klein, and Margulis, 1998), some of them went to study the profiles of the successful project managers to identify the ideal competences for success (Nauman, S. & Khan, A. M., 2006), whereas recent research shows that different leadership styles are appropriate for different project contexts (Ralf Muller et al, 2007). Even though leadership has proven to be one of the critical success factors of project success, studies failed to link specific leadership styles with project success as (Vittal S. Anantamula, 2010) concluded that, the relationship between project leadership and project success is still unclear and recommended further research efforts in this matter. Since 1940 and up to date six schools of thought govern the leadership literature, the trait school, behavioural school, contingency school, visionary school, emotional intelligence school and competency school. Measuring project leadership depends on what school of thought has been selected, for instance the Competency theory uses Leadership Dimensions Questionnaire (LDQ) (R. Müller, and J.R. Turner, 2010), whereas, the Full Range theory measured by measurement model and factor structure of Bass and Avolio's Multifactor Leadership Questionnaire (MLQ) (Bass, B. M., & Avolio, B. J. (1995-2004).

## 1.3. Project type and project success

The dominant paradigm for defining and understanding projects is the PMI comprehensive model: "Project is a temporary endeavour undertaken to create a unique product, service, or result" (PMBOK, 2017, page 715). Projects drive change in organization by moving it from one state to another state in order to achieve a specific objective which in turn, enable business value creation in many forms for the organization. This implies that the project may come in many forms and so many different types.

Studying of project types led to uncover important dark holes in the dilemma of project success, for instance, (Koray Kandemir, 2020) revealed that type of the project has important impact in the overall success, project complexity and size as well, while (Fink, Laura, 2019) considered project type is a genuine part in chasing project success and concluded that: "the key to success is to have the right degree of cohesiveness and right degree of innovativeness that should be determined based on the type of the project, project complexity and the purpose of the project". Other studies consider specifying the project type is the base step to understand the nature of relationship between project success and other important success factors e.g. project leadership, for instance (Bianca Novo, et al, 2017) concludes that managerial and emotional competencies (as factors of leadership) have important causative effects in determining the success of a project, this success can be negatively affected if the wrong leadership style is chosen and/or if the project manager is inexperienced with the project type. Also (Li-Ren Yanga, et al., 2011) investigated the role of project type in the relationship between project team and project success and revealed that project type has a moderating effect on the relationship between teamwork dimensions and overall project success.

## 1.4. Project culture and project success

Organization/project culture considered as one of the major factors affect project performance and alter project success, there is extensive amount of literature advocate the importance of the existence of friendly culture within the project atmosphere. (Yazici, 2010) argues that organizations need to assess their cultural orientation and make change efforts as a result of these assessments rather than keeping organizational culture an invisible and non-measurable matter. Organizational culture has a significant influence on project performance and the long-term success of organizations. (Mullaly & Thomas, 2009) carried forward the PMI four years in depth study in fourteen countries within sixty-five case study which confirmed the value of project manager but indicated that it depends on culture and implementation fit. (A Nachbagauer, 2019) assessed the influence of project and organization culture on managing turbulences in projects and leading to project success, the paper came to the conclusion that successful cases reported to be embedded in a more project friendly culture. Whereas successful project leaders had significantly better values in deliver success to projects, the open and positive project culture was supported by an equally open organizational culture, and the project-oriented organizations rewarded openness and knowledge sharing, and a positive error culture.

How to generate the required project culture? to answer this question, the scholars take different paths. (Agarwal et al., 2017) choose to adopt the view that national culture is not a major factor in influencing project success, rather, organizational culture and a shared understanding on leadership do. The study asserts that the context consists of an organizational culture that fosters information sharing and teamwork for the accomplishment of project results. The study elaborates on (Aubrey et al., 2010) explanation for the typical project culture that it reflects organization culture ability to transformation to Project Management Office (PMO) that can drive culture change to support project success. The PMO practices support best practices and management skills sharing within organized project management activities recording and sharing Office.

Many studies support the PMOs existence as basic incubators and frontline advocates of project culture in organizations. (PMBOK, 2017) strongly recommend them, especially for project oriented organizations. Other attempt to describe the best project culture was done by study (Yazici, H. J., 2010), the study conclude that, specifically, two culture types based on the Organizational Culture Assessment Instrument, OCAI by (Kim Cameron, 2003) were found to relate to perceived performance, clan culture and market culture, Organizations with strong clan cultures can be successful internally as well as externally; therefore, a culture profile in which clan and market are dominant is the best strategy to reduce project uncertainty as well as external market challenges.

## 1.5. Question & Hypotheses

The main question provided by this article to be answered is; what are the relationships between project leadership, project type, project culture and project success in Sudan? In order to answer this question, four hypotheses have been developed:

Hypothesis (1): There is significant relationship between project leadership and the success of project.

Hypothesis (2): Different project types require different leadership styles in order to attain project success.

Hypothesis (3): There is significant correlation between project culture and project success.

Hypothesis (4): The leadership role in project success is moderated by the project culture.

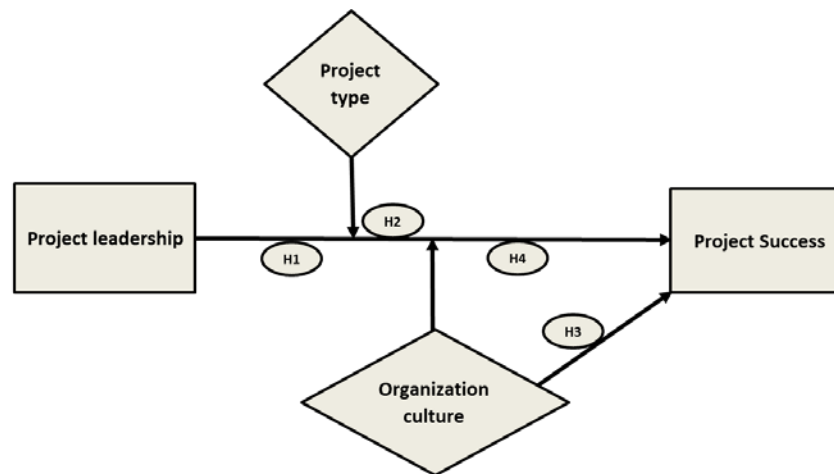


Figure (1) The proposed conceptual model for relationships among the study variables

## 2. Methods

### 2.1 Procedure

The study was conducted in Sudan. The target population was the project managers working in different business sectors based in Sudan. Deduction approach for theory development was used. Furthermore, the methodological choice was mono method quantitative study which represents by questionnaire as a single data collection technique and utilized by survey as a research strategy, as well as snapshot time horizon i.e. cross section method is adopted for data collection and analysis. In sum, the study follows the quantitative (descriptive and explanatory) approach to well address the study problem. The descriptive approach imposed by the need to develop an accurate understanding of the status quo of the project management practice and project success in Sudan to come up with a logical explanation of the situation, whereas the explanatory approach was mandatory as the main purpose of the study was to define the nature of the relationship between the project success and its proposed predictors.

### 2.2 Measures

The study comprised one dependent variable (project success) and three independent variables (leadership, type and culture). For the project success the study adopted David Bryde, 2008 measure as it distinguishing between project management success and project success and incorporating the objective measures (time, cost and quality) as well as the subjective measures (overall satisfaction of customer and other stakeholders). For project leadership, the measurement scale adopted was the leadership styles approach (Transformational, Transactional and laissez faire) using the model of Bass and Avolio's Multifactor Leadership Questionnaire (MLQ) (Bass, B. M., & Avolio, B. J. (1995-2004) as it has been used widely in project management literature and proved its suitability in similar past studies. With regard to project type, the study adopted the four project categorizations provided by (Ralf Müller, Rodney Turner, 2010) based on (Crawford et al, 2005), as they represent the most categories often found in projects' domains and considered suitable for the purpose of this study, the four project classification attributes (application area, complexity degree, strategic importance and Contract types) comprised thirteen different types of projects. For measuring project culture, the study utilized and adapted the measures provided by (Monique Aubry et al. 2010) which comprised three culture indicators (project management and methods, accountability and skills and work climate) represented by six dimensions. In sum, the overall items measuring the dependent and independent variables are 51 items as showed in table (1).

Variables	Constructs	Dimensions	Sources
Project Leadership	Transformational style	1. Idealized influence 2. Inspirational motivation 3. Individual consideration 4. Intellectual stimulation	Multifactor Leadership Questionnaire (MLQ) (Bass, B. M., & Avolio, B. J. (1995-2004)
	Transactional style	5. Contingent reward 6. Management by exception	
	Laisses faire style	7. Laisses faire	
Project Culture	Project Culture	1. Project management and methods 2. Accountability and skills 3. Work climate	(Monique Aubry et al. 2010)
Project Type	By application area	1. Organizational change 2. Information & Telecommunication 3. Technology 4. Engineering & Construction	(Ralf Müller, Rodney Turner,2010) (Crawford et al. ,2005)
	By complexity	5. High complexity 6. Medium complexity 7. Low complexity	
	By strategic importance	8. Mandatory 9. Repositioning 10. Renewal	
	By contract types	11. Fixed 12. Re measurement 13. Alliance	
Project Success	Project Success	1. Objective measures 2. Subjective measures	(David Bryde,2008) (Jha and Lyr ,2007)

Table (1) The measurement scales

### 2.3 Instruments

Questionnaire as the most appropriate methods of obtaining data in this case was used. A pilot version has been prepared and utilized first, then final copy has developed and distributed to the sample elements. The questionnaire comprised five sections started with demographic information section through project type, project culture, project success and ended with project leadership.

### 2.4 Sample

The unit measurement of the study is the individual project manager in Sudan, accordingly all project managers working in different fields and sectors inside the country represent the target population of the study, unfortunately, there is no official list for this population, no accurate enumeration or even estimation till the date of study and the target population is hidden and hard to reach, consequently the sampling frame is considered unavailable and the probability sampling has excluded. Accordingly snowball sampling technique used, because it is of common use when it is difficult to identify members of the desired population, (Saunders 2015).

### 2.5 Data analysis & techniques

After data have been collected they checked, sorted, organized and coded before being delivered to the statistical program to be analysed and provide a statistical description for the sample used and judge the quality of the research productivity. Hence various statistical tests have been used including reliability, validity, factor analysis, correlation, regression and moderation analysis.

## 3. Results

Out of 312 contacted project managers, the questionnaire yields 173 valid responses i.e. 59% response rate, the respondents profile is depicted in table (2).

<b>Gender</b>	<b>Male</b>	<b>Female</b>
	146	27
	84%	16%
<b>Nationality</b>	<b>Sudan</b>	<b>Other</b>
	172	1
	99%	1%

<b>Age</b>	<b>30 or less</b>	<b>31-40</b>	<b>41-50</b>	<b>51 or more</b>
	31	55	60	27
	17.9%	31.8%	34.7%	15.6%
<b>PM experience</b>	<b>5 or less</b>	<b>6 -10</b>	<b>11-15</b>	<b>16 or more</b>
	41	45	41	46
	23.7%	26.0%	23.7%	26.6%
<b>Organization ownership</b>	<b>Public</b>	<b>Private</b>	<b>NGO</b>	<b>Government</b>
	11	118	18	26
	6.4%	68.2%	10.4%	15.0%
<b>Work experience in current organization</b>	<b>5 or less</b>	<b>6 -10</b>	<b>11-15</b>	<b>16 or more</b>
	84	39	24	26
	48.6%	22.5%	13.9%	15.0%
<b>Current position in organization</b>	<b>Top Mgt.</b>	<b>Mid Mgt.</b>	<b>Senior</b>	<b>Junior</b>
	57	65	46	5
	32.9%	37.6%	26.6%	2.9%
<b>PM certification</b>	<b>PMP</b>	<b>PRINCE 1,2</b>	<b>None</b>	<b>Other</b>
	44	11	101	17
	25.4%	6.4%	58.4%	9.8%
<b>Education level</b>	<b>Below high school</b>	<b>High school</b>	<b>Diploma</b>	<b>BSc.</b>
	1	0	6	76
	0.6%	0.0%	3.5%	44.2%
	<b>High diploma</b>	<b>Master</b>	<b>Doctorate</b>	
	8	70	12	
	4.6%	40.5%	6.7%	

Table (2) The respondents profile

### 3.1 Goodness of measures

Reliability and validity tests were used to be sure that the instruments do indeed measure the variables they are supposed to, and that they measure them accurately. Furthermore, the study conducted exploratory factor analysis to assess the uni-dimensionality of measures to all continuous variables under study. After applying the factorial validity, the reliability of empirical measurements (leadership, culture and success) was obtained using Cronbach's alpha test. Moreover, EFA analysis used to test convergent validity and discriminant validity, correlation analysis used also to confirm the validity results.

### 3.2 Validity analysis

With regard the leadership dimensions the study found that the project leadership style in Sudanese context consists of four styles, two styles of transformational leadership represents by transformational (idealized influence), beside aggregate transformational style (inspirational motivation, individual consideration and intellectual stimulation) and transactional style (contingent rewards and management by exception) as well as laisses faire style. Results depicted in table (3).

With regard the project success dimensions the study found that the project success in Sudanese context consists of two distinct factors, the first one is the subjective success which measured by pre-specified objectives, the level of achieving the expected benefits, the success regards of key stakeholders, the client satisfaction and the satisfaction of the parent organization. The second factor is the objective success which can be measured directly using the project management success factors i.e. (time, cost and quality and the effectiveness of the application of the project management processes). In other words, the Sudanese context differentiate between the project success (the former factor) and the project management success (the latter factor). Results depicted in table (4).

With regard the project culture in Sudanese context, the study found that it consists of only one tight and single construct, which indicated by supportive climate, supportive and capable organization and well equipped project team. Results depicted in table (5).

Item code	Items	Component			
		1	2	3	4
	<b>Transformational /collate style</b>				
19	I call attention to what team members can get for what they accomplish	0.770			
17	I get team members to rethink ideas that they had never questioned before	0.719			

16	I help team members find meaning in their work	0.653			
18	I give personal attention to team members who seem rejected	0.609			
<b>Transactional style</b>					
6	I am satisfied when team members meet agreed-upon standards		0.788		
12	I provide recognition/rewards when team members reach their goals		0.720		
20	I tell team members the standards they have to know to carry out their work		0.593		
11	I let team members know how I think they are doing		0.583		
<b>Transformational /Idealized influence style</b>					
15	Team members are proud to be associated with me			0.768	
1	I make team members feel good to be around me			0.766	
8	Others have complete faith in me			0.745	
<b>Laisses faire style</b>					
14	Whatever others want to do is OK with me				0.844
21	I ask others no more than what is absolutely essential				0.838
<b>Eigen values</b>		<b>4.267</b>	<b>1.508</b>	<b>1.240</b>	<b>1.055</b>
<b>Percentage of variance explained</b>		<b>32.82</b>	<b>11.59</b>	<b>9.535</b>	<b>8.118</b>
		<b>2</b>	<b>9</b>		
<b>Total variance explained</b>		<b>62.074%</b>			
<b>Kaiser-Meyer – Olkin (KMO)</b>		<b>0.815</b>			
<b>Bartlett’s test of sphericity</b>		<b>602.108**</b>			

Table (3) Exploratory factor analysis for testing the validity of leadership

Item code	Items	Component	
		1	2
<b>Subjective Success</b>			
2	This project has achieved its stated objectives	0.866	
3	This project has delivered the expected benefits	0.852	
6	The project was regarded as success by the key stakeholders	0.695	
5	The project was regarded as success by the client	0.676	
1	My organization rank this project as a successful project	0.669	
<b>Objective Success</b>			
11	The project management process used was effective		0.797
4	The project has delivered the required outputs within the time set for it		0.737
10	The project has delivered the required outputs within the cost specified for it		0.667
7	The project outputs were of the expected quality		0.584
<b>Eigen values</b>		<b>4.739</b>	<b>1.127</b>
<b>Percentage of variance explained</b>		<b>48.656</b>	<b>12.517</b>

	<b>Total variance explained</b>	<b>61.173</b>
	<b>Kaiser-Meyer – Olkin (KMO)</b>	<b>0.847</b>
	<b>Bartlett’s test of sphericity</b>	<b>641.018**</b>

Table (4) Exploratory factor analysis for testing the validity of Project success dimensions

Item code	Items	Component
		1
	<b>Project culture</b>	
4	I feel that my project work has strong supportive climate	0.831
2	I feel strong collaboration between project managers & line managers	0.736
3	This project team are well equipped with project management skills	0.731
1	The work environment supports project management culture	0.729
6	Always we have enough resources to cover multiple projects	0.700
	<b>Eigen values</b>	<b>2.787</b>
	<b>Percentage of variance explained</b>	<b>55.744</b>
	<b>Total variance explained</b>	<b>55.744</b>
	<b>Kaiser-Meyer – Olkin (KMO)</b>	<b>0.815</b>
	<b>Bartlett’s test of sphericity</b>	<b>244.660**</b>

Table (5) Exploratory factor analysis for testing the validity of Project culture dimensions

### 3.3 Reliability analysis

Measuring reliability of scales implies that examine the degree of consistency among the scale items i.e. to what degree of precision they measure the variable /construct they intended to measure it. This study uses Cronbach’s alpha to assess the reliability of scales. Hair et. al 2010 asserts that the lower limit of Cronbach’s alpha is 0.7 however, it may decrease to 0.6 in exploratory research. Nunnly ,1978 considers values greater than 0.6 are reliable. The summary of reliability results is illustrated in table (6).

Construct	Variable	No of items	Cronbach’s alpha
Project Leadership styles	Transformational	4	0.72
	Transactional	4	0.71
	Transformational- Idealized influence	3	0.73
	Laisses faire	2	0.67
All leadership styles		13	0.81
Project Culture	Project culture	5	0.80
Project Success	Subjective success	5	0.86
	Objective success	4	0.72
All success		9	0.86

Table (6) Reliability of the continuous variables

### 3.4 Descriptive statistics

Bearing in mind that, five point Likert scale (1=Not at all, ...,5= Frequently but not always) used to analyse results of leadership styles, the results revealed that the project managers in Sudan focus on using transformational and transactional leadership styles in leading projects with relative low focusing on laisses faire styles. With respect to project culture, given that, five point Likert scale (1=strongly disagree,5= Strongly agree) used, the sample data reflect relative low supportive culture for the projects in Sudan. With regard to the project classification, given that a dichotomous scale (Yes=1, No =0) was used for this variable, it can be concluded that, the four projects attributes are usable in Sudanese context with relative degree of closeness, whereas the most vibrant type of projects in Sudan are engineering and construction. Projects of medium complexity, mandatory type, re-measurement and fixed price show high frequency respectively. For the project success, five point Likert scale (1=strongly disagree,5= Strongly agree) was used for this variable, it can be concluded that, In the Sudanese context, the subjective measure of success comes first while the objective measures are not much realized specially the time constraints, however it gave high priority for quality satisfaction. it’s worth to

mention that, the overall rating of project success in Sudan context, is below the average limits.

### 3.5 Correlation analysis

Results of correlation analysis supported the outcomes of factor analysis as it assured the convergent and discriminant validity of the variables. The results of bivariate correlations showed also strong evidences of association between the dependent variable (Project Success) and the continuous independent variables (Leadership and culture).

Correlations			
	Leadership	Culture	Success
Leadership	1		
Culture	.154	1	
Success	.193*	.571**	1

Table (7) Pearson's bivariate correlation for the main variables in the study.

### 3.6 Regression analysis

Hypothesis (1) assumed direct and significant relationship between project leadership and project success, hence simple linear regression analysis has been applied to test this dependency relationship and the results in table (8) supported the given hypothesis.

Parameter	Statistics	Parameter	Statistics
R	0.193	Standard error of estimate	2.816
R Square	0.037	Degree of freedom	171
Adjusted R	0.032	Sig. F change	0.011
F change	6.639		

Table (8) Results of the simple regression model between leadership and project success

Hypothesis (2) assumed that, different project types require different leadership styles in order to attain project success. The model summary in table (9) shows that the intervention of the interaction effects of the project type and project leadership in the model of leadership and project success is positively alter the relationship with the project success i.e. there is strong moderation effect of the project type in the relationship between leadership and success. Thus the result support hypothesis (2).

	R	R square	Ad-justed R	F change	S. error of estimate	Degree of freedom	Sig. F change
Main effect(L+T)	0.195	0.038	0.027	3.343	2.824	170	0.038
Main effect + Interaction (L+T) + (L*T)	0.276	0.076	0.06	6.969	2.775	169	0.009
Moderation effect(difference)	0.81 ↑	0.038 ↑	0.033 ↑				0.029

Table (9) results of the multiple regression model between leadership, type and project success.

Hypothesis (3) assumed direct and significant relationship between project culture and project success. Results in table (10) supported the given hypothesis.

Parameter	Statistics
R	0.571
R Square	0.326
Adjusted R	0.322
F change	82.861
Standard error of estimate	2.355
Degree of freedom	171
Sig. F change	0.000

Table (10) Results of the simple regression model between leadership and project success

Hypothesis (4) assumed that, project culture moderates the relationship between project leadership and project success. The



model summary in table (11) shows that that the intervention of the interaction effects of the project culture and project leadership in the model of leadership, culture and project success is positively altering the relationship with the project success i.e. there is positive moderation effect of the project culture in the relationship between leadership and success.

	R	R square	Ad-justed R	F change	S. er-ror of estimate	Degree of free-dom	Sig. F change
Main effect(L+C)	0.581	0.338	0.330	77.116	2.342	170	0.000
Main effect + Interaction (L+C) +( L*C)	0.589	0.346	0.335	2.253	2.334	169	0.000
Moderation effect(difference)	0.008 ↑	0.008 ↑	0.005 ↑				0.000

Table (11) results of the multiple regression model between leadership, culture, interaction effect and project success

To find the best fitted model, a hierarchical regression analysis was run using the accumulated effect of the three independent variables, the results showed that project leadership ,project culture ,with the effective intervention of project leadership and project type plus effective interaction between leadership and project culture can positively alter the project success, the optimum model of project leadership ,project type and project culture explain 36.3% of the variation in project success in Sudan.

Model Summary											
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					ANOVA, Sig	Collinearity Average VIF
					R Square Change	F Change	df1	df2	Sig. F Change		
1	0.195 <sup>a</sup>	0.038	0.027	2.82382	0.038	3.343	2	170	0.038	0.038	1.002
2	0.276 <sup>b</sup>	0.076	0.06	2.77551	0.038	6.969	1	169	0.009	0.004	1.003
3	0.598 <sup>c</sup>	0.357	0.342	2.32173	0.281	73.517	1	168	0	0	1.024
4	0.603 <sup>d</sup>	0.363	0.344	2.31753	0.006	1.61	1	167	0.206	0	1.03
A. Predictors: (constant), type, leadership.											
B. Predictors: (constant), type, leadership, moderator( leadership* type).											
C. Predictors: (constant), type, leadership, moderator (leadership*type), culture.											
D. Predictors: (constant), type, leadership, moderator( leadership*type), culture, moderator (leadership*culture).											
E. Dependent variable: average success											

Table (12) results of a hierarchical multiple regression model.

## 4. Discussion & Findings

### 4.1 Relationship between Project leadership and Project Success

The first objective of this study was to investigate the role of project leadership in project success in Sudan. The study results reveal that there is positive statistical significant relationship between project leadership and project success in Sudan. However, this relationship does not provide high contribution to project success and constrained by other factors which strengthen or supress its effect in project success. This conclusion confirms that transformational, transactional and laisses faire leadership styles are suitable predictors of project leadership in Sudan. Moreover, the findings agree with (Jiang et al., 1998, Anderson, 1992, Jennifer & Francis,2006 and Vaníčková,2020) who signified the role of project manager in project success. The results also agree with the (PMBOK,2017) which asserted that numerous leadership styles can be adopted by the project manager to meet success. Moreover many studies e.g. (Turner & Müller, 2006, Muller et.al, 2018a and Agarwal et al. ,2017) revealed that different leadership styles can influence success in various ways positive or negative, depending on other factors for instance, project type, project lifecycle stage and project culture.

### 4.2 Relationship between Project culture and project success

This relationship proved to be of high importance in Sudan setting, results show high contribution of supportive project culture to project success. In fact, it shows the most significant relationship among other predictors. The results confirms the suitable use of project culture dimensions which were adopted from the Project Management Office (PMO)literature and reflect how far the parent organizations would go to support their projects ,the results also agree with the recommendations of (PMBOK,2017) and findings of (Andersen et al. ,2006, Yazici, ,2010 and Alvesson & Sveningsson, 2016 ), who concluded that project culture plays a significant role in project success .It's worth mentioning that, project culture plays two folded role in this relationship. The first one is the direct positive relationship with the project success, and the second one its contribution to the project success through its moderating role on the relationship between project leadership and project success. Moreover, this result shows how project managers in Sudan rate

culture, and to what extent they see it as strong predictor for their project outcomes in Sudan setting.

### **4.3 Relationship between project type and Project success**

Project type is a categorical variable, it has no direct relationship to project success, however it has significant impact in the relationship between project leadership and project success. Results of the moderation analysis imply that leadership in project management is constrained by the type of project which should be managed. This result asserts that different project types require different leadership styles in order to attain the desired level of success. The results also denote the attention to that, some types of projects may require more than one style to be applied through their different phases. This outcome supports the conclusion of (Kerzner, 2003, Turner & Müller, 2006 and Muller et.al 2018a).

### **4.4 The impact of project type and project culture in the relationship between project leadership and project success**

Based on the summary provided above, it's quite obvious that the results proved the significant contribution of project leadership to project success. But certainly it failed to link specific leadership theory or style to project success in Sudan. However, adding project type and project culture as a moderation factors has solved a considerable part of this complex relationship, it gives a good clarification to how the interaction between leadership and Success works. The final hierarchical model illustrates that, project culture and project type play a significant role in the relationship between project leadership and project success. Results showed that the limited contribution of leadership to success (3.7%) can be enhanced dramatically by creating supportive project culture and finding the best fit between leadership style and project type to reach a considerable amount of contribution (36.3%). This means that the intervention of the moderators makes the relationship stronger (by culture) and fine-tuned (by type). The results drive attention to various causes of projects failure which can be rooted to poor project culture and mismatch between project manager and type of project. The results also are consistent with conclusions of many studies which confirmed the role of project type and project culture in the relationship between project leadership and project success, e.g. (Jennifer & Francis, 2006, Nixon et al. 2011, Anantatmula, 2010 and Maqbool, et al. , 2017).

In sum, with regard business and project management, the results may answer significant questions i.e. is it worthwhile to build supportive project culture within the parent organization in order to capture successful projects? Assigning the right project manager ...is it matter? To what extent project managers are responsible for the success of their projects?

## **5. Conclusion**

Firstly, analysis of association between leadership styles and different project types came up with the conclusion that no significant correlations, no specific associated pairs and more than one style may associate with the same type of project. However, the transformational leadership styles showed strong link with the most successful projects of many types, and this articulates with (Avolio, 2011) who defended the effectiveness of transformational leadership over transactional leadership style and concluded that the best of leaders frequently do some of the latter and more of the former. Moreover, this confirms the notion that, there is no particular leadership effective in all project situations, but a specific leadership style is more effective than others in a specific situation. Also specific leadership style is more appropriate in a specific project category. It's worth noting that, this conclusion supports many previous assertions made by many scholars e.g. (Yakhchali & Farsani, 2013, Nixon et al. , 2011 and Tahir & Naeem, 2017).

Secondly, the empirical findings of this research confirmed the double tyres role played by project culture in improving project success (the high significance contribution of positive culture to project success and the moderating role played in the relationship between project leadership and project success). Hence this finding supports the efforts exerted by (Nachbagauer, 2019, (Ali, et al. , 2020 and Shao, 2017) who drove attention for the importance of project culture aspect and called for more empirical investigations in the role of organization culture and project culture in project success.

Thirdly, concerning the continuous debates regarding what originates from other in organization context: culture or leadership? the study findings support the notion of (Alvesson & Sveningsson, 2016, Müller & Turner, 2010) who give priority to the role of organization/project culture over the role of leadership in attaining project success. However, the proven strong linkage between transformational leadership and project success gives a third dimension to this relationship by pointing to the role of effective leadership in laying and supporting project culture. This in turn fit onto the assertion of (Block, 2003) who indicated that project leaders as immediate supervisors should have great contribution to organization culture and project culture than do high leadership levels.

Fourthly, this study gives empirical support to the hybrid measure (objective +subjective) of project success as effective tool to distinguish the successful projects from other. The findings in this regard extend the project success literature in tracking and tethering all project success criteria e.g. (Anton de Wit, 1988, Bryde, 2008 and Yakhchali & Farsani, 2013).

### **5.1 Limitations of the study**

This study was constrained by many spatial and time restrictions include but not limit to the following:

- 1- Data has been collected using cross sectional research design –one snap shot at a specific point in time, which may raise issues of causality and common method bias.
- 2- The method of sampling used, non-probability sampling (snowball) which restricted the generalizability of the study find-

ings.

- 3- The limited access to information due to the nature of target population, as there is no specific frame list for the unit of analysis (project managers) and the lack of available and reliable data due to rare local past studies in the same topic.
- 4- Choosing project managers as the sole unit of analysis may affect the final findings with response bias as many others (e.g. top managers) can be involved in the study and reflect more comprehensive view to elaborate the study results.
- 5- Time constraints and political turbulent environment which caused by Covid 19 pandemic and consequences of the Sudanese glorious revolution which may have affected the respondents desire to participate and react actively to the study. This, in turn may cause bias responses.

However, a lot of methodological and statistical efforts have been exerted to overcome these limitations and reduce their impacts in the final findings.

## 5.2 Theoretical implication

The debatable role of project leadership in project success have push many bodies working in the project management industry to explore other hidden factors that particularly intersect with the project leadership and affect the project success. Accordingly, the literature went to provide both project type and project culture as significant factors affect the role of the project leadership in project success as explored by( Müller & Turner-b,2009, Yanga\_et al. ,2011).However, subsequent studies that worked to test and confirm these relationships and determine their nature are very rare in the world. Consequently, this study fills substantial gap and lays many theoretical implications that can be summarized in the following lines.

1. The study revealed that various transformational leadership styles are applicable in one project through its lifecycle and more than one style may have associated with the same type of project. However, the transformational leadership styles showed strong link with the most successful projects of many types, and this articulates with (Avolio et. al. ,2011). Moreover, this confirms the notion that, there is no particular leadership style effective in all project situations, but a specific leadership style is more effective than others in a specific situation. It's worth noting that, this conclusion supports Contingency theory (Fiedler,1978) and many previous assertions made by many scholars e.g. (Yakhchali & Farsani, 2013, Nixon et al. ,2011 and Tahir & Naeem,2017).
2. The empirical findings of this research confirmed the important role played by project culture in improving project success. Hence this finding supports the efforts exerted by (Nachbagauer ,2019, Ali, et al. ,2020 and Shao,2017) who drove attention for the importance of project culture aspect and called for more empirical investigations in the role of organization culture and project culture in project success.
3. Concerning the continuous debates of what originates from other in organization context: culture or leadership? the study findings support the notion of (Alvesson &Sveningsson, 2016, Müller & Turner,2010) who give priority to the role of organization/project culture over the role of leadership in attaining project success. However, the proven strong linkage between transformational leadership and project success gives a third dimension to this relationship by pointing to the role of effective leadership in laying and supporting project culture. This in turn fit onto the assertion of (Block,2003) who indicated that project leaders as immediate supervisors should have great contribution to organization culture and project culture than do high leadership levels.
4. The study gives empirical support to the hybrid measure (objective +subjective) of project success as effective tool to distinguish the successful projects from other. The findings in this regard extends the project success literature in tracking and tethering all project success criteria e.g. (Anton de Wit,1988, Bryde,2008 and Yakhchali & Farsani,2013).

Last but not least, findings of this study provide many answers regarding the relationship between project leadership, project type, project culture and project success. Accordingly, the study fills a considerable gap in project management literature in general and cast alight in business and project management in Sudan. Moreover, it offers valuable extension to the limited project management studies in the developing countries.

## 5.3 Practical implication

First: in order to achieve project success, attention should be given to the right selection of project leader and the best articulation with the project type.

Second: to create supportive project culture, taking in consideration that project is a temporary organization requires stable setting with predefined rules and regulations to support and push it towards success, and that the effective leader without supportive culture is not enough to reach success.

Third: to be aware that in organizations of restricted/low project culture, project managers should not be held accountable for overall project performance metrics that are beyond their control, nor should their responsibilities be enlarged beyond their normal levels of competence and familiarity.

Fourth: to emphasize the role of lesson learned within the projects experiences. Its well-known that projects continue to oppose to

high volatile environments, the substantial rule is that (one size does not fit all). So organizations with ongoing projects should manage to establish Project Management Offices (PMO) to capture the advantages of experience and to catch the low hanged fruit of the sustainable development movement.

Fifth: project managers need to develop their leadership skills on ongoing manner. Not only to be ready to deal with the high volatile project environment but also to create and develop the supported project culture, alternatively organizations need to focus on create and support leaders rather than raise managers with limited technical capabilities and functions.

#### 5.4 Recommendations for further research

Findings of this study enhance the project management literature in that it expands the efforts in tracking project success criteria and elaborate the project culture concept. However, the limitations faced by this study and the final findings have raised the need for further recommended researches as follow:

- 1- Expand the research in the relationship between leadership and project success by using alternative leadership theory e.g. Competency leadership theory to explore the competencies of the successful project managers and its association with project types and project success.
- 2- Project management research in Sudan is still of virgin setting, this implies the need for conducting qualitative researches to explore and describe the projects status quo and to offer sufficient data for the upcoming researches.
- 3- The study revealed that the amount of projects subjected to fail in Sudan is high, this implies that, scholars and practitioners are required to conduct in-depth investigations to uncover the proposed causes and suggest the possible remedies.
- 4- Project culture found to be of high effect in project success in Sudan, needless to say that project culture is still of slow creeping in project management literature. So researches efforts should be of more concern of project culture and how to create and improve it in business reality.
- 5- Findings of this study reveals the high contribution of engineering sector in project practices, high existence of engineers in project manager position. So its highly recommended for further causal studies in the relationship between engineering schools' curriculums, project management practice and project success.
- 6- Evidences from literature pointed to that, Countries facing with high corruption index and low level of political stability do not have project management regulations for public projects which hinder fighting against corruption. Otherwise findings of this study indicate low success rates for governmental and public projects. As well as poor project culture and dominance of laisses faire leadership style in leading governmental and public projects in Sudan. Accordingly, its highly recommended for further researches in the causes and effects of public/governmental projects success.

#### References

- [1] Agarwal, A. Dixit, V. Jain, K. Sankaran, S. Nikolova N, Müller, r. Drouin, N. (2017). Exploring Vertical and Horizontal Leadership in Projects: A comparison of Indian and Australian contexts. *Accelerating Development: Hamessing the Power of Project Management*, p. 2017.
- [2] Ali Memon, M., Cheah, J.-H., Ramayah Hiram Ting, T., Chuah, F., Huei Cham, T., & Tunku Abdul Rahman, U. (2019). Moderation analysis: issues and guidelines. In *Journal of Applied Structural Equation Modelling* (Vol. 3).
- [3] Anantatmula, V. S. (2010). Project manager leadership role in improving project performance. *EMJ - Engineering Management Journal*, Vol. 22, pp. 13-22.
- [4] Andersen E.S. (2006). Toward a project management theory for renewal projects, *Project Management Journal*, 37(4), 15-30.
- [5] Anderson S.D (1992), Project quality and project managers, *International Journal of Project management*, 3 (138-144).
- [6] Aubry, M., Hobbs, B., Müller, R., & Blomquist, T. (2010). Identifying forces driving PMO changes. *Project Management Journal*, 41(4), 30-45.
- [7] Aubry, M., Müller, R., Hobbs, B., & Blomquist, T. (2010). Project management offices in transition. *International Journal of Project Management*, Vol. 28, pp. 766-778.
- [8] Bass, B. M., & Avolio, B. J. (1995). Evaluate the impact of transformational leadership training at individual, group, organizational, and community levels, *Binghamton* (p. 2004). p. 2004.
- [9] Besner, C. & Hobbs, J.B (2006). The perceived value and potential contribution of project management practices to project success. Paper presented at PMI Research Conference: New Directions in Project Management.
- [10] Blaskovics, B. (2016). The impact of project manager on project success - The case of ICT sector. *Society and Economy*, 38(2), 261-281.
- [11] Block, L. (2003). The leadership - culture connection: an exploratory investigation. *Leadership & Organization Development Journal*, Vol. 24 No. 6, pp. 318-334.
- [12] Breshers, E. M., & Volker, R. D. (2018). Leadership Theories. In *Facilitative Leadership in Social Work Practice*.
- [13] Bryde, D. (2008). Perceptions of the impact of project sponsorship practices on project success. *International Journal of Project Management*, Vol. 26, pp. 800-809.
- [14] De Wit, A. (1988) Measurement of Project Success. *International Journal of Project Management*, 6, 164-170.
- [15] Fiedler, F. E. (1978). The contingency model and the dynamics of the leadership process. In *Advances in experimental social psychology* (Vol. 11, pp. 59-112). Academic Press.
- [16] Fink, L. *Operational Excellence versus Breakthrough Innovation*.
- [17] Harold Kerzner, (2003). *Advanced Project Management: Best practices on implementation*, John Wiley & Sons.
- [18] Hoegl, M., & Parboteeah, K. P. (2007). Creativity in innovative projects: How teamwork matters. *Journal of engineering and technology management*, 24(1-2), 148-166.
- [19] Jiang, J. J., Klein, G., & Margulis, S. (1998). Important behavioral skills for IS project managers: The judgments of experienced IS professionals. *Project Management Journal*, 29(1), 39-43.

- [20] Joslin, R., & Müller, R. (2016). The relationship between project governance and project success. *International Journal of Project Management*, 34(4), 613-626
- [21] Kandemir, K. (2020). *CRITICAL SUCCESS FACTORS IN INDUSTRIAL PLANT CONSTRUCTION PROJECTS* (Doctoral dissertation, Bogazici University).
- [22] L.A. Ika, Project success as a topic in project management journals,
- [23] Levý, L. (2020). The relationship between authentic leadership in project managers and project success (Vol. 81).
- [24] Maqbool, R., Sudong, Y., Manzoor, N., & Rashid, Y. (2017). The Impact of Emotional Intelligence, Project Managers' Competencies, and Transformational Leadership on Project Success: An Empirical Perspective. *Project Management Journal*, 48(3), 58-75.
- [25] Thomas, J. L., Mullaly, M., Thomas, J. L., & Mullaly, M. (2009). Explorations of value: Perspectives of the value of project management. *Project Management Journal*, 40(1), 2-3.
- [26] Müller, R., & Jugdev, K. (2012). Critical success factors in projects. *International journal of managing projects in business*, (5),757-775.
- [27] Müller, R., & Turner, J. R. (2007). Matching the project manager's leadership style to project type. *International Journal of Project Management*, 25(1), 21-32.
- [28] Müller, R., & Turner, J. R. (2005). The project manager's leadership style as a success factor on projects: a literature review. *Project Management Journal*, (1997), 49-61.
- [29] Müller, R., & Turner, R. (2010). Leadership competency profiles of successful project managers. *International Journal of Project Management*, Vol. 28, pp. 437-448.
- [30] Müller, R., Zhu, F., Sun, X., Wang, L., & Yu, M. (2018). The identification of temporary horizontal leaders in projects: The case of China. *International Journal of Project Management*, Vol. 36, pp. 95-107.
- [31] Nachbagaer A,(2019),On the Influence of project and organization culture on managing turbulences in projects,PMUni Workshop.
- [32] Narayanaswamy, R., Grover, V., & Henry, R. M. (2013). The impact of influence tactics in information system development projects: A control-loss perspective. *Journal of Management Information Systems*, 30(1), 191-226.
- [33] Nauman, S., & Khan, A. (2006). Patterns of leadership for effective project management. *Journal of Quality and Technology Management*, Vol. 20.
- [34] Nixon, P., Harrington, M., & Parker, D. (2012, January). Leadership performance is significant to project success or failure: A critical analysis. *International Journal of Productivity and Performance Management*, Vol. 61, pp. 204-216.
- [35] Novo, B., Landis, E., & Haley, M. L. (2017). Leadership and Its Role in the Success of Project Management. *Journal of Leadership, Accountability, and Ethics*, 14(1), 73-78.
- [36] Prabhakar, G. P. (2008). Projects and their management: A literature review. *International Journal of Business and Management*, 3(8), 3-9
- [37] PMBOK. (2017). *PMBOK Guide - 6th Edition*. In Project Management Institute (Vol. 40).
- [38] Saunders, M., Lewis, P., & Thornhill, A. (2015). *Research methods for business students* (7th New ed). Res. methods Bus. students. 7th ed. England: Pearson, 124.
- [39] Shao, J. (2018). The moderating effect of program context on the relationship between program managers' leadership competences and program success. *International Journal of Project Management*, Vol. 36, pp. 108-120.
- [40] Sicotte, H., & Langley, A. (2000). Integration mechanisms and R&D project performance. *Journal of Engineering and technology management*, 17(1), 1-37.
- [41] Sveningsson & Alvesson , 2016, *Managerial lives: Leadership and Identity in an imperfect world*, Cambridge University Press.
- [42] Tahir, M., & Naeem, H. (2017). The Impact of Switch Leadership on Project Success: Empirical Evidence from UAE. *European Scientific Journal, ESJ*, Vol. 13, p. 241.
- [43] Vaníčková, R. (2020). Human factors errors and identification of causes of successful/unsuccessful completion of business projects. *SHS Web of Conferences*, 73, 01030.
- [44] Wit, A. De. (1988). Measurement of project success. *International Journal of Project Management*, Vol. 6, pp. 164-170.
- [45] Yakhchali, S. H., Farsani, H. H., & Leadership, A. (2013). Do Different Project Categories Need Different Leadership Styles?
- [46] Yang, L. R., Huang, C. F., & Wu, K. S. (2011). The association among project manager's leadership style, teamwork and project success. *International Journal of Project Management*, Vol. 29, pp. 258-267.
- [47] Yazici, H. J. (2009). The Role of Project Management Maturity and Organizational Culture in Perceived Performance. *Project Management Journal*, Vol. 40, pp. 14-33.
- [48] Zhu, W., Riggio, R. E., Avolio, B. J., & Sosik, J. J. (2011). The effect of leadership on follower moral identity: Does transformational/transactional style make a difference?. *Journal of Leadership & Organizational Studies*, 18(2), 150-163. *Project Management Journal*. 40 (4) (2009) 6-19.