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Impact of Project Management Methodology, Project Governance, and Knowledge Sharing Behavior on Project Success with the moderating effect of Documentation Culture: A case study of Pakistani organizations

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Abstract: Despite burgeoning interest in the project success, there are still significant gaps in our understanding of its antecedents. The study aims to bridge this gap and investigates project management methodologies, project governance, and knowledge sharing behaviour as critical antecedents of project success. The study explores the boundary effects of documentation culture that might underpin the hypothesized relationships. The study collected data from 305 individuals working in project organizations in Pakistan. The data were processed in SMART PLS (v 3.3) to assess the measurement model and the structural model. The findings reveal that project management methodologies, project governance, and knowledge sharing behaviour are significant factors that determine project success. Besides, the study found that documentation culture moderates the underlying association *such that* the relationships are more pronounced at higher levels of documentation culture and vice versa. The study presents substantial contributions to theory and practice.

1- Introduction

Despite burgeoning interest in the project success, there are still significant gaps in our understanding of this phenomenon (Davis, 2017). Although a great deal of effort has been put into investigating the antecedents of project success. Prior studies report that project success has always remained a challenging issue for practitioners and researchers (Wu, Liu, Zhao, & Zuo, 2017). This just makes present research more salient to explore the antecedents of project success so that a more robust and practical framework should be developed that might offer maximum capacity for the success of the projects. This is because unsuccessful projects translate into severe losses to the project stakeholders (Maqbool, Sudong, Manzoor, & Rashid, 2017). Unfortunately, many projects cannot be completed within their budget constraints,

schedule, and scope, ergo compromising the desired satisfaction and quality of their stakeholders (Maqbool *et al.,* 2017). According to Standish Group International (2009) report, the success of projects dropped to 32 percent from 34 percent in 2009. Papke-Shields *et al.* (2010) found deficient project outcomes in 86 percent of their respondents that were surveyed from 600 organizations across 22 countries. Hence, there is a constant surge of investigating factors that contribute to the success of projects (Ma & Fu, 2020).

Considered these allusions, the present research aims to address the following issues about the project success *such that* (1) exploring the antecedents of project success in project organizations in Pakistan, and (2) outstretching the boundary conditions of project success in project organizations in Pakistan. To address the aforementioned issues, the current study discourses threefold purposes. First, the study speculates that the success of a project depends on a variety of factors rather than a single factor. Some preliminary investigations unveiled prior attempts in exploring factors that influence project success. For instance, (Maqbool *et al.,* 2017) have examined the human side of project success and found significant positive effects of emotional intelligence, project manager's competencies, and leadership style on project success. Pathan and Carvalho (2012) found an association between project management methodologies on project success. Similarly, Joslin and Müller (2016) reported a significant relationship between project governance and project outcomes. Likewise, Gemünden (2015) linked knowledge sharing with project success through a sequential mediation mechanism. However, there lacks empirical evidence that cast a variety of factors that contribute to the success of projects. Therefore, the present study encompasses project governance, project management methodologies, and knowledge sharing behaviour as the key enablers of project success for project organizations in Pakistan.

Second, in addition, to guide the theoretical arguments about the direct effects of project governance, project management methodologies, and knowledge sharing behaviour on project success; this study also seeks to expand the boundary effects documentation culture that might underpin the proposed associations. Some prior research on documentation culture renunciates project documentation as a critical factor that affects the success and failure of project organizations (Todorović *et al.,* 2015). Because the omission of documentation in the development process of projects may lead to corporate memory loss (Turk, France, & Rumpe, 2002). On contrary, good documentation allows companies to identify areas of weakness, measure present performance, and start improvement actions (Coleman & Verbrugen, 1998). Therefore, the study speculates that the direct effects of project governance, project management methodologies, and knowledge sharing behaviour on project success are intervened by an effective documentation culture *such that* the associations are more pronounced at high levels of documentation culture and vice versa.

Third, most of the research on project success has been conducted in the Western cultural contexts, *i.e.,* low power distance ("relatively equal distribution of power") and individualism (Zheng, Wan, Chen, & Wang, 2014). However, it is highly arguable to generalize findings from cultures that appear to be opposites from non-Western cultural contexts as showed by high power distance ("respect for the social hierarchy") and collectivism ("prioritizing the group over the individual") (Hofstede, 1983). For instance, these cultural differences impact the governance practices (Xiang, Li, & Shou, 2013) as well as the knowledge sharing behaviour of individuals (Chen, Zhou, Probert, & Su, 2017). Therefore, it is of huge significance to

investigate these factors in non-Western cultural settings and assess their effects on project success. Formally, the study seeks to investigate (1) the direct effects of project governance, project management methodologies, and knowledge sharing behaviour on project success in the non-Western cultural settings, and (2) the moderating effects of documentation culture in the direct relationships of project success and its antecedents.

Hypotheses development

One of the most researched topics in project management is project success. Nonetheless, the meaning of the word "success" varies substantially (Joslin & Müller, 2015). One of the major distinctions is presented by Cooke-Davies (2002) who distinguished project success, "which is measured against the overall objectives of the project, and accomplished through the use of the project's output", and project management success, "which is measured at the end of the project against success criteria, *such as* those relating to internal efficiency, typically cost, time, and quality" (Atkinson, 1999). Müller and Turner (2007) corroborated that the achievement of these measures may get affected throughout the project life cycle through "success factors". The current study encompasses these success factors and projects that project governance, project management methodologies, and knowledge sharing behaviour influence project success. To investigate the roles of these factors in project success, the subsequent section develops the relevant hypotheses.

Project governance and its linkage to project success

According to Klakegg *et al.* (2009), governance should encompass all organizational levels *such as* "corporate governance" that makes board level and management level responsible for their deeds and actions, and project level governance *such as* that is in harmony and alignment with organizational level governance but also should consider individual projects. The Organization for Economic Co-Operation and Development (OECD) defined corporate governance as:

> "Involving a set of relationships between a company's management, its board, its shareholders and other stakeholders [...] and should provide proper incentives for the board and management to pursue objectives that are in the interests of the company and its shareholders and should facilitate effective monitoring *OECD* (2004, p. 11)".

However, the definition of project governance according to The Project Management Institute (PMI®) is "an oversight function that is aligned with the organization's governance model and that encompasses the project life cycle [and provides] a consistent method of controlling the project and ensuring its success by defining and documenting and communicating reliable, repeatable project practices" (PMI, 2013, p. 34). Müller, Pemsel, and Shao (2015) argued that project governance extends beyond individual projects to a group of projects, *i.e.,* portfolio or program of projects.

Drawing on these definitions, we can find a mere distinction between individual projects and programs or portfolios of projects. According to Joslin and Müller (2016), the governance of a group of projects aligns with corporate governance. Extensive literature suggests that a positive connection exists between corporate governance and corporate performance. Weaker corporate governance predicts poor corporate performance (Hirschey, Kose, & Anil, 2009). On contrary, independent board leaders and greater shareholder rights culminate into enhanced corporate performance (Hirschey *et al.,* 2009). Thus, a theoretical deduction

drawn from these assumptions supports our corollary that project governance leads positively to project success. This is also considering the prior studies of Sirisomboonsuk, Gu, Cao, and Burns (2018); Ul Musawir, Serra, Zwikael, and Ali (2017) that effective project governance results in successful project delivery.

Hence, hypothesis 1 is:

H1. There is a positive relationship between project governance and project success.

Project management methodologies and their linkage with project success

For the last few decades, researchers in the realm of project management have shifted their attention from individual methods and tools to multiple tools and methods (Lehtonen & Martinsuo, 2005). It has also led to a lot of inconsistencies to describe tools and methodologies that are inherent in this transition (Joslin & Müller, 2016). For instance, Prince 2 – a process-oriented project method referred to as "a method that supports some aspects of project management" (TSO, 2009). These methodologies have been categorized into baseline models, practice models, knowledge models, and process models (Anderson & Merna, 2003).

Project management methodologies are complex and hence several international standards have been reviewed to define project management methodologies (Müller & Jugdev, 2012). The Project Management Institute (2013) defined project management methodologies as "a system of practices, techniques and procedures, and rules". However, it is also noted that project management methodologies are not universally described (*e.g.,* Wells, 2012). This is the reason the present study adopts Joslin and Müller's (2016) definition of project management methodologies–"elements as processes, tools, techniques, knowledge areas, and comprehensive capability profiles".

It is also noted that empirical evidence on project management methodologies is deficient and results are contradictory because of the complex nature of this phenomenon (Joslin & Müller, 2016). For instance, it split literature on the specific outcomes of project management methodologies into its contribution in achieving goals (Cooke-Davies, 2002) or perceived appositeness of project management (Lehtonen & Martinsuo, 2006). Positive attitudes and unrealistic expectations are also the desired outcomes of project management methodologies (Lehtonen & Martinsuo, 2006). In case, if expected results are not achieved from these methodologies, another set of methodologies (White & Fortune, 2002 might replace these). Therefore, it is a worthy consideration to apply a specific set of methodologies to achieve project-specific desired outcomes (Joslin & Müller, 2016). The authors found positive correlations between project management methodologies such that "the experience of using project management methodologies and the correct choice of tools, techniques, and processes are both success factors".

Hence, hypothesis 2 is:

H2. There is a positive relationship between project management methodologies and project success.

Knowledge sharing behaviour and its linkage with project success

Knowledge sharing refers to "a behaviour or process where an individual voluntarily shares their unique skills, experiences and expertise with individuals inside or outside a project team" (Raziq *et al.,* 2020). Knowledge can be “tacit” or “explicit”. Tacit knowledge refers to "the intangible knowledge, which typically lives in an individual's mind, in the individual's form's experiences, insights and values, and, which may not be easily transferred to another individual" (Nonaka, 1994). Whereas, explicit knowledge refers to “the knowledge in tangible form, which can be easily stored, transferred and communicated across individuals and organizations” (Davenport & Prusak, 2000). van den Hooff and de Ridder (2004) argued that sharing knowledge, either tacit or explicit, is beneficial for individuals and organizations because it enables the creation of new knowledge. Similarly, Raziq *et al.* (2020) endorsed that knowledge sharing is of supreme importance for project organizations. Knowledge sharing facilities working in projects, because individuals work in groups, execute projects’ operations and hence require facilitation of knowledge for carrying out these activities (Raziq *et al.,* 2020). Typically, knowledge sharing is executed in projects during the project life cycle (Kerzner, 2013).

Project success is, specifically, measured in terms of budget, time, and scope (Joslin & Müller, 2016). Besides, project success involves a management aspect, *i.e.,* "effective team management and performance", and the last delivery of the project aspect (Raziq *et al.,* 2020). Knowledge sharing fosters teamwork in project organizations, which is directly related to enhanced team performance and product quality (Lindsjørn *et al.,* 2016). Similarly, Pangil and Moi Chan, 2014) also found positive correlates between knowledge sharing and team effectiveness. Toral *et al.* (2010) concluded that knowledge sharing predicts project success. Gibson *et al.* (2019) conducted their study on multinational firms and found reportage of knowledge sharing on project success. In a similar thread, Dietrich (2007) suggested that knowledge sharing is critical for producing new knowledge, handling unexpected situations, meeting the goals of the projects, and the success of the project.

Hence, hypothesis 3 is:

H3. There is a positive relationship between knowledge sharing behaviour and project success.

The moderating role of documentation culture

The study further expects the moderating effects of documentation culture on the associations between project management method, project governance, knowledge sharing behaviour, and project success. Some argue extensive documentation in project management culminates ineffective communication between users, managers, and developers, especially in the analysis phase (Garceau, 2015). Good documentation "allows companies to measure current performance, identify areas of weakness, and start improvement actions" (Coleman & Verbruggen, 1998). The study conducted by Luqi *et al.* (2004) emphasized the importance of comprehensive systems documentation, which records all phases of the project life cycle and possesses the capability to manage even complicated issues often related to real-time systems. Such a system enables stakeholders or users to communicate with each other and effectively monitor the “system development process” by rendering opportunities to receive the squirrelled information (Zhang *et al.,* 2004). Documentation facilitates knowledge creation, knowledge acquisition, and knowledge transfer, and knowledge application and identification at the project level (Todorović *et al.,* 2015). Similarly, Ruuska *et al.* (2009) reported an association between documentation procedure and project governance. Whereas,

lack of documentation leads to inefficiency in project governance (Garland, 2009), ultimately reducing the likelihood for the project success. In addition, a research study concluded by Špundak (2014) highlighted the need for formal documentation with traditional as well as an agile management methods. The authors also corroborated that documentation is necessary for each method, however, the traditional project management method requires intensive formal documentation than the agile project management method, which is focused on tacit knowledge. Combining these allusions, we projected that an effective documentation culture is essential for project success in each stage of the project life cycle.

Therefore, the following hypotheses are developed:

H4. Documentation culture moderates the relationships between (a) project governance, (b) project management method, and (c) knowledge sharing behaviour, and project success.

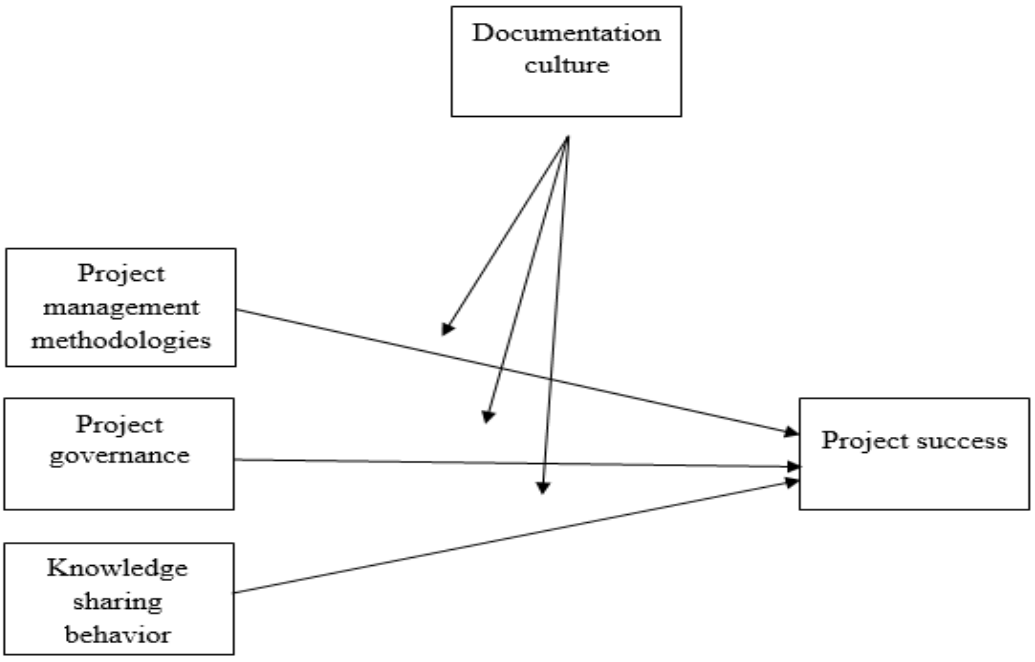


Figure 1. Conceptual model

2- Method

Participants and procedures

To test the hypothesized model, the researcher gathered data from individuals working in project organizations at management levels in Pakistan at different time intervals of four weeks each (*i.e.,* two waves). The authors deployed a one-month lag between each wave to minimize the biases such as illusory correlation and consistency motifs (Peng, 2013). We distributed the research instrument to the arbitrarily selected respondents. Each participant received a cover letter that specifies the details of the survey, along

with a questionnaire. It explained the significance of the study and ensured confidentiality to comfort any assessment apprehension. At time 1, the authors collected 343 responses out of 390 distributed questionnaires (with a response rate of 88%) about project management methodologies, project governance, and knowledge sharing behaviour; documentation culture; and individual demographics, including age, gender, education, employment tenure, and project characteristics, such as project life cycle. At time 2, the authors contacted these 343 participants again to gather project success responses and received 312 responses, of which 305 could match with the original responses (response rate, 77%).

Finally, all the responses were merged that were gathered in each wave with the key generated by each participant as per the directives given in the surveys (*i.e.,* initials followed by their birth month). Of the 305 respondents, 65% of males took part in the survey with a mean age of 32.98 years with a standard deviation of 5.48 years. 65% of participants were holding a bachelor's degree or above, and a mean employment tenure was 3.97 years, with a standard deviation of 0.78 years. Concerning the project's characteristics, the mean life cycle was 4.35 years, with a standard deviation of 1.34 years.

Measures

We have adapted the measurement scales to test the hypothesized model from previous studies. We distributed the questionnaires in English, as it is a medium of instruction in educational institutes and business organizations in Pakistan. We anchored the questionnaires on a 5-point scale from 1 ("strongly disagree") to 5 ("strongly agree").

Project management methodologies

Instrument to measure project management methodologies was adapted from Joslin and Müller (2015) and measured using a 20-item scale. Sample items included "the organization's project management methodologies have a comprehensive set of tools", and "the organization's project management methodologies have a comprehensive set of processes".

Project governance,

Instrument to measure project governance was adapted from Müller and Lecoeuvre (2014) and measured using a 10-item scale. Sample items included "in my organization, decisions are made in the best interest of the shareholders and owners of the organization and their return on investment (ROI)", and "in my organization, prevails an image that profitability determines the legitimacy of actions".

Knowledge sharing behaviour

Instrument to measure knowledge sharing behaviour was adapted from Bock *et al.* (2005) and measured using a 5-items scale. Sample items included "I will always provide my know-where or know-whom at the request of other organizational members".

Project success

Instrument to measure project success was adapted from Khan and turned (2013) and measured using a 25-item scale. Sample items included "resources mobilized and used as planned", and "minimum number of agreed scope changes".

Documentation culture

Instrument to measure documentation culture was adapted from Gollner *et al.* (2015) and measured using an 18-item scale. Sample items included "how would you describe the culture of your organization?", and "do you have a concern about the transitions to a documentation culture?".

3- Results

Measurement model

The study deployed a reflective hypothesized model and checked, at the first stage, "internal consistency" using "Cronbach's alpha" and "composite reliability" (CR) metrics, and "convergent and discriminant validity" by assessing "outer loadings", "average variance extracted" (AVE), "Fornell-Larcker", and "heterotrait-monotrait" (HTMT) indices (Hair *et al.,* 2017). To confirm "internal consistency" in the study, values of Cronbach's alpha and CR should be greater than the minimum threshold level of 0.6 and 0.7 (Nunally & Bernstein, 1994). Results illustrated in table 1 provide evidence of "internal consistency". To test "convergent validity", AVE scores were assessed and data reveals that all the AVE values are above the minimum acceptable value of 0.5 (Hair *et al.,* 2017). Similarly, "outer loadings" were also assessed to measure indicators' reliability and all the values above 0.4 were kept for further data analysis except for PMM2, PG4, PS6, PS8, and DC11, which were dropped in the subsequent analysis because of poor loadings (Hair *et al.,* 2017).

Table 1. Validity and reliability for constructs

	Loadings	AVE	CR	Cronbach's alpha
Project management methodologies		0.646	0.880	0.842
PMM1	0.510			
PMM3	0.709			
PMM4	0.734			
PMM5	0.762			
PMM6	0.830			
PMM7	0.746			
PMM8	0.635			
PMM9	0.425			
PMM10	0.719			
PMM11	0.713			

PMM12	0.656			
PMM13	0.759			
PMM14	0.545			
PMM15	0.658			
PMM16	0.465			
PMM17	0.455			
PMM18	0.745			
PMM19	0.781			
PMM20	0.749			
Project governance		0.501	0.864	0.812
PG1	0.771			
PG2	0.427			
PG3	0.616			
PG5	0.736			
PG6	0.796			
PG7	0.839			
PG8	0.819			
PG9	0.703			
PG10	0.439			
Knowledge sharing behavior		0.624	0.842	0.776
KSB	0.703			
KSB	0.834			
KSB	0.759			
KSB	0.801			
KSB	0.668			
Project success		0.600	0.892	0.876
PS1	0.505			
PS2	0.806			
PS3	0.729			
PS4	0.564			
PS5	0.564			
PS7	0.765			
PS9	0.765			
PS10	0.545			
PS11	0.834			
PS12	0.589			
PS13	0.632			
PS14	0.800			
PS15	0.712			
PS16	0.612			
PS17	0.704			
PS18	0.735			
PS19	0.689			

PS20	0.786			
PS21	0.634			
PS22	0.801			
PS23	0.764			
PS24	0.721			
PS25	0.520			
Documentation culture		0.712	0.778	0.714
DC1	0.590			
DC2	0.610			
DC3	0.723			
DC4	0.801			
DC5	0.800			
DC6	0.623			
DC7	0.700			
DC8	0.789			
DC9	0.846			
DC10	0.786			
DC12	0.675			
DC13	0.679			
DC14	0.568			
DC15	0.456			
DC16	0.623			
DC17	0.754			
DC18	0.692			

Note. PMM: project management methodologies; PG: project governance; KSB: knowledge sharing behavior; PS: project success; DC: documentation culture

After confirming convergent validity, the study also checked discriminant validity to ensure that intra-construct correlation should be greater than inter-construct correlations (Hair *et al.*, 2017). For this purpose, we assessed discriminant validity using the HTMT criterion (Henseler *et al.*, 2009). HTMT criterion is a more robust measure of discriminant validity than cross-loadings and Fornell-Larcker (1981) (Henseler *et al.*, 2015). To examine the HTMT ratio, the study used the bootstrapping technique with a re-sample of 5,000 using a one-tailed t-test at 90% significance level, to warrant an error probability of 5%. Table 2 shows the results of the HTMT ratio. All the values are below the maximum acceptable threshold level of 0.85 ($HTMT_{.85}$) and 0.90 ($HTMT_{.90}$). Thus, its discriminant validity was validated.

Table 2. Heterotraitmonotrait (HTMT) Criterion

	PMM	PG	KSB	PS	DC
PMM					
PG	0.508				
KSB	0.612	0.892			
PS	0.560	0.875	0.879		
DC	0.399	0.846	0.814	0.891	

Note. PMM: project management methodologies; PG: project governance; KSB: knowledge sharing behavior; PS: project success; DC: documentation culture

Structural model

After validating the measurement model, the study assessed the structural model using a non-parametric, bias-corrected and sped up (BCa) bootstrapping technique with a re-sample of 5,000 to yield the "path coefficient" (β) values and their relevant *t*-values. In addition, "coefficient of determination" (R^2), "predictive relevance" (q^2), and "effect size" (f^2) are reported to examine the association among latent variables (Hair *et al.,* 2017). Results of this analysis presented in table 3 reveal that project management methodologies have a significant positive correlation with project success (β = 0.301; t = 6.155; p = 0.000; f^2 = 0.301), supporting *H1*; project governance has a significant positive relationship with project success (β = 0.174; t = 3.663; p = 0.000; f^2 = 0.174), supporting *H2*; and knowledge sharing behavior has a significant positive relationship with project success (β = 0.234; t = 8,669; p = 0.000; f^2 = 0.204), supporting *H3*.

Table 3. Effects on endogenous variables

Hypotheses	β	CI (5%, 95%)	SE	*t*-value	p-value	Decision	f^2	R^2	Q^2
PMM → PS	0.301**	(0.222; 0.377)	0.049	6.155	0.000	Supported	0.301	0.577	0.332
PG → PS	0.174**	(0.104; 0.262)	0.047	3.663	0.000	Supported	0.174		
KSB → PS	0.234**	(0.146; 0.345)	0.050	8.669	0.000	Supported	0.204		
PMM*DC → PS	0.289**	(0.212; 0.389)	0.052	11.229	0.001	Supported	0.332		
PG*DC → PS	0.273**	(0.143; 0.428)	0.089	3.081	0.002	Supported	0.145		
KSB*DC → PS	0.258**	(0.186; 0.308)	0.027	2.146	0.032	Supported	0.389		

Note. PMM: project management methodologies; PG: project governance; KSB: knowledge sharing behavior; PS: project success; DC: documentation culture; **significance p < 0.05 (1.96)

The study hypothesized a moderated model; therefore, the intervening role of documentation culture was also assessed using a two-stage approach, consistent with Hair *et al.'s* (2017) recommendations. To test the interaction effect, CIs and effect we tested size using BCa bootstrapping procedure with 5,000 re-samples.

The analysis found that interaction term (project management method*documentation culture) has a significant impact on project success (β = 0.289; t = 11.229; p = 0.001; f^2 = 0.332), with a large effect size (Kenny, 2016). The analysis found that interaction term (project governance*documentation culture) has a significant impact on project success (β = 0.273; t = 3.081; p = 0.002; f^2 = 0.145), with a medium effect size (Kenny, 2016). The analysis found that interaction term (knowledge sharing behavior*documentation culture) has a significant impact on project success (β = 0.258; t = 2.146; p = 0.032; f^2 = 0.389), with a large effect size (Kenny, 2016). Table 3 illustrates that CIs didn't straddle 0 to get the β value of the interaction effect, supporting *H4a, H4b, and H4c*.

In line with Dawson's (2014) recommendations, the simple slope interaction effect was also plotted to understand the direct associations between project management methodologies, project governance, knowledge sharing behaviour, and project success, moderated by documentation culture. Figures 2, 3, and 4 present graphical representations of the effect of interaction terms (project management method*documentation culture); (project governance*documentation culture); and (knowledge sharing behaviour*documentation culture) on the project's success. The analysis presented in figures 2, 3, and 4 validates the proposed moderated model, *i.e.,* documentation culture strengthens (1) the positive connection between (i) project management methodologies, (ii) project governance, and (iii) knowledge sharing behaviour on project success *such that* the relationship is more pronounced at higher levels of documentation culture (vice versa).

Figure 2. Interaction term (PMM*DC)

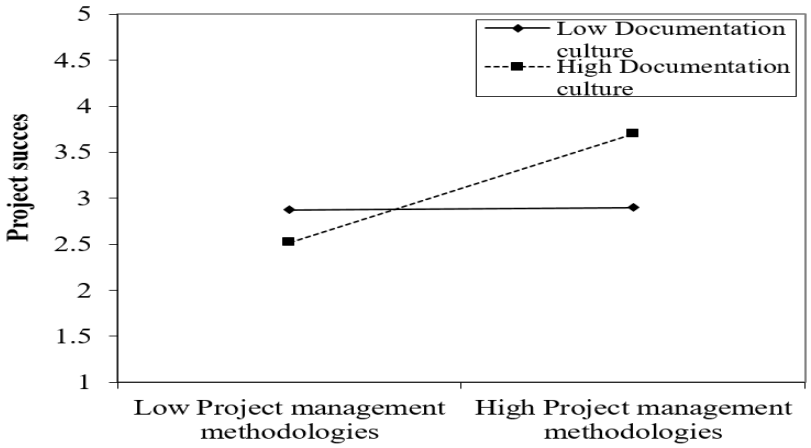


Figure 3. Interaction term (PG*DC)

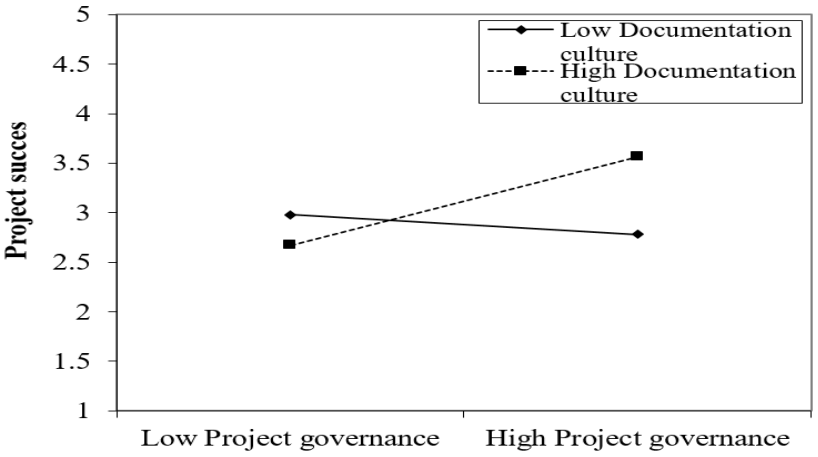
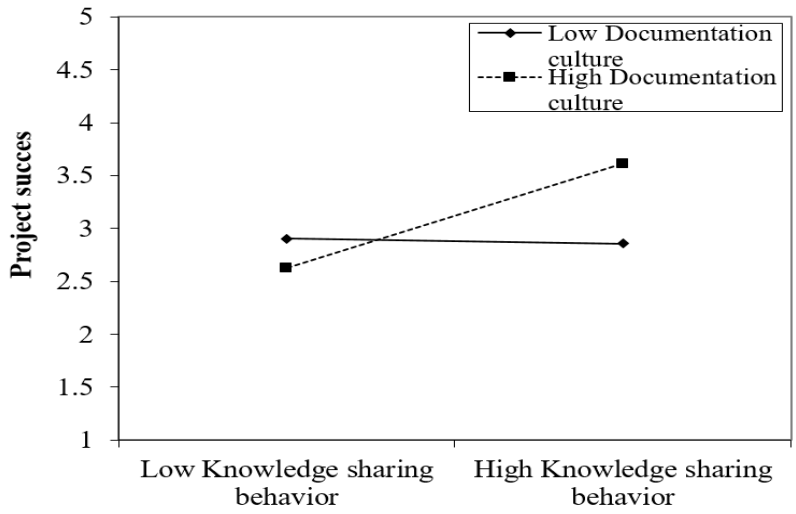


Figure 4. Interaction term (KSB*DC)



The study also assessed the good-of-fit index (GFI) using Tenenhaus *et al.'s* (2005) diagnostic tool (shown in table 4). The authors defined GFI as "the geometric mean of the average communality and average R^2". Results show a GFI value above the cutoff value of 0.36 for a large effect size of R^2, confirming a good model fit (Hoffman & Brinbrich, 2012). Besides, the standardized root means square residual (SRMR) was also tested to confirm the model fitness. SRMR assesses "the model's difference between the implied correlation matrix and the observed correlation matrix" (Hair *et al.,* 2017). In this analysis, the SRMR value of 0.077 was less than the maximum threshold value of 0.80, ensuring a good model fit. Finally, the predictive relevance of the hypothesized model was also tested using Stone-Geisser's Q^2, with an omission distance of 6. The analysis generated a Q^2 value greater than 0. Hence, the model's predictive relevance was also established.

Table 4. Goodness-of-Fit Index (GFI)

Constructs	AVE	R^2
PMM	0.646	
PG	0.501	
KSB	0.624	
DC	0.712	
PS	0.600	0.577
Average scores	0.616	
($GFI = \sqrt{\overline{AVE} \times \overline{R^2}}$)	0.596	

Note. PMM: project management methodologies; PG: project governance; KSB: knowledge sharing behavior; PS: project success; DC: documentation culture

4- Discussion and Conclusion

This research investigates the direct effects of project management methodologies, project governance, and knowledge sharing behaviour on project success in project organizations in Pakistan. The authors collected data from project organizations in Pakistan across fresh waves. Empirical analysis of this study confirmed the proposed relationships, *such as* project management methodologies, project governance, and knowledge sharing behaviour, significantly influence the project success. In addition, the study also assessed the intervening role of documentation culture between the study variables. The study found that documentation culture significantly moderates the associations between project management method, project governance, and knowledge sharing behaviour, and project success *such that* the relationships are more pronounced at higher levels of project success and vice versa. The subsequent section presents the study's theoretical and practical implications and directions for future research.

Implications for theory and practice

The current study presents extant contributions to the existing knowledge of project success. First, the study speculated that, despite the burgeoning interest in project success (Davis, 2017), there are still significant gaps in our understanding of the underlying phenomenon. The research contributed to the theory of project success by associating it with project management methodologies, project governance, and knowledge sharing behaviour as the key antecedents. Although prior studies have made substantial attempts in examining these factors that contribute to the project success in isolation. For instance, Joslin and Müller (2015) found a positive correlation between project governance and project success. Besides, the authors also identified that project management methodologies are crucial factors that determine the success of projects. In a similar vein, Pangil and Moi Chan (2014) highlighted the role of knowledge sharing behaviour in effective project management and project success. However, these studies have investigated the role of these variables in isolation, which undermines existing studies on project success and warrants further examination of the construct by exploring a wide range of antecedents that influence the success of projects. Therefore, the findings of this study contribute rich insights to the project management literature. According to Wu *et al.* (2017), it was necessary to investigate several antecedents that translate into project

success because (i) project success is a complicated phenomenon and it requires a holistic investigation of the key antecedents, and (ii) heightened project failure rate due to lack of deliberations on the holistic assessment of project success.

Second, the study's theoretical contribution extends beyond the examination of direct effects of project management methodologies, project governance, and knowledge sharing behaviour on project success, to the exploration of the boundary effects of documentation culture that underpin this relationship. Despite the immense importance of good documentation for project success, prior studies report that project success is compromised because of the lack of formal documentation. Therefore, this quantitative study brings light on the importance of a good documentation culture for project success. The findings suggest that documentation culture moderates the relationships between project management methodologies, project governance, and knowledge sharing behaviour, and project success. The findings of this research are in harmony with previous studies, which found that poor documentation system leads to corporate memory loss (Turk *et al.,* 2002), whereas good documentation transforms into improved effectiveness and accomplishment of performance measures (Coleman & Verbrugen, 1998).

Third, some preliminary investigations on the key constructs suggested that most of earlier scientific inquire have been conducted in the Western cultural contexts. Whereas, studies encompassing these variables in the non-Western cultural contexts are deficient. For instance, in a non-Western cultural context, *i.e.,* attributed to a high-power distance culture, it is important to study the impact of project governance, or knowledge creation, knowledge acquisition, and knowledge transfer on project success. Hence, the investigation of the proposed theoretical framework in a non-Western cultural context makes this study more salient.

Finally, the study offers meaningful insights for practice. Such as the findings of this study offer substantial empirical evidence to support the applications of these variables in the success of projects. For instance, project managers should realize the importance of knowledge sharing for the exchange of timely information, *both* tacit and explicit, which is an essential element of project success. Similarly, all the project managers must know the governance paradigm as well as should have access to comprehensive project management methodologies. This would allow project managers to know which project management methodologies are to apply to a project. Last but not the least, we found documentation culture to be an intervening variable that accounts for project success, coupled with project management methodologies, project governance, and knowledge sharing behaviour. This study presents substantial evidence instead of documentation culture because documentation can minimize project failures by leveraging governance, essential knowledge sharing, and project methodologies. Project managers should take necessary interventions to manage the formal documentation of projects.

Limitations and future directions

The study presents several theoretical and practical implications. These are subject to several limitations. First, the use of time-lagged data is the strength of this study. However, future studies should employ a longitudinal design to generalize the predictability of the proposed theoretical framework. Second, we conducted this study in a non-Western cultural context, therefore, the findings of this study should not be generalized in Western countries. This merits future studies to be conducted in Western countries. Finally,

future studies may investigate interpersonal factors such as leadership style as a moderating variable that might also underpin the relationship between project management methodologies, project governance, knowledge sharing behaviour and project success.

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