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RESEARCH ARTICLE

# The Mediating Role of Benefit Management for Sustaining the Performance of Infrastructure Projects

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## Abstract

Benefit management is a valuable approach, promoted and supported by strategic management for maximizing organizational benefits. It has also been recognized as a means of improving project performance, though more research is needed to understand how it works. This research adds to the contemporary literature on public sector project management by studying the links between project governance, benefit management, and project performance from a developing country perspective. This study provides insights for project professionals who are working in government organizations for optimizing the benefits of investment. The study provides a reference to formulate strategies for managing and governing the performance of government-funded projects in developing countries like Pakistan. The research uses a positivist approach and quantitative design.

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The quantitative technique is employed to address all the aspects of the study. The structural equation modeling revealed that benefit management acted as a mediating factor in the relationship between project governance dimensions and public sector project performance. This study highlights the importance of incorporating a comprehensive benefit management approach to streamline the benefit management process by aligning projects with the organizational strategy for sustaining project performance. These findings stress the need for a comprehensive benefit management approach in improving the project performance of government-sponsored projects. The study attempts to improve the understanding of project professionals about the role and significance of benefit management, which will be helpful to get organizational support for the employees who are striving to improve the project performance in Pakistan.

## Keywords

**Public Sector; Benefit Management; Project Governance; Project Performance**

## Introduction

Over the last few decades, there has been growing concern among researchers and practitioners that, despite improvements in project management practices, a high percentage of projects continue to fail to achieve their intended outcomes, resulting in enormous financial losses for funding organizations ([Ingle and Mahesh, 2020](#); [McDermot, et al., 2020](#)). The Project Management Institute (PMI), ([PMI, 2018](#)) global survey showed that, on average, nearly one in three projects do not meet their goals. In the same survey, it is estimated that approximately US\$ 1 million is wasted every 20 seconds by organizations because of poor project management practices. This is equivalent to around US\$ 2 trillion wasted a year. As projects become larger and more complex worldwide, investors and funding organizations place a higher priority on the value deriving from investments in projects ([Bhatt and Sarkar, 2020](#); [Jin, et al., 2021](#)). For a project to deliver value, project benefits need to be appropriately identified and realized. Accordingly, benefit management (BM) has gained attention as an important area of consideration in project management ([Bradley, 2016](#)). Although BM is crucial for project success ([Zwikael and Smyrk, 2015](#)), there is considerable evidence to suggest that organizations are not able to properly execute benefit management strategy and therefore unable to realize project benefits ([Breese, et al., 2015](#)). According to a survey conducted by Klynveld Peat Marwick Goerdeler (accounting firm) (KPMG) in 2005, only 2 percent of organizations achieved targeted benefits in the previous year. Surprisingly, almost 33 per cent of organizations do not even consider financial benefits in their approach. According to [PMI \(2016\)](#) these findings also remain valid in as the percentage of organizations reporting low maturity in benefits realization is at 40 percent, a number that has been on an increasing trend over the past years..

Scholars have examined the factors for the effective and consistent BM approach in projects and have suggested project governance (PG) as one of the most significant factors ([Hesselmann and Kunal, 2014](#); [Bradley, 2016](#)). Effective BM could be enabled through a comprehensive governance framework that ensures project outcomes are associated with the proposed benefits ([Hjelmbrekke, Lædre and Lohne, 2014](#)). Other similar studies have also underlined the importance of BM in enhancing project performance ([Badewi, 2016](#)). However, literature is scarce on the process through which BM does affect project performance (PP). Moreover, regarding the governance mechanisms, there is still room to explore the present literature that facilitates the adoption and implementation of benefit realization practices ([Hesselmann and Kunal, 2014](#)). This research investigates the interrelationship of PG, BM and PP in public sector projects in Pakistan. It has been widely acknowledged that efficient and reliable infrastructure is essential for sustained economic growth ([Khan, et al., 2021a](#)).

Governments around the world are focussing on infrastructure projects to meet the enormous infrastructure requirements that are estimated to range between US\$ 2.9 trillion to US\$ 6 trillion on an

annual basis ([OECD, 2018](#)). The Belt and Road Initiative (BRI) strategy by the Chinese government aims to facilitate trade and investment through infrastructure development across six economic corridors covering one-third of global GDP ([Abid and Ashfaq, 2015](#)). Pakistan is a strategic partner in China's BRI through the China-Pakistan Economic Corridor (CPEC), which includes infrastructure projects currently valued at over US\$ 60 billion. It is estimated that 2 to 2.5 percentage points will be added through CPEC to Pakistan's annual economic growth by 2030. The success of CPEC and other BRI-related projects mainly depends on the successful delivery of infrastructure projects. However, government-sponsored infrastructure projects all over the world tend not to meet their objectives, thereby resulting in cost overruns. For that reason, this is timely research that attempts to examine the relationship between PG and BM.

Given the growing importance of infrastructure projects on a global scale and the aforementioned limitations of the existing research, there is a need to undertake a comprehensive study to examine the relationships between PG, BM and PP. This research presents empirical evidence that will help both academics and practitioners to improve project performance through benefit management.

## Literature Review

BM has been discussed as the process of identifying, defining, planning, tracking, and realizing business benefits for a company. ([Jenner, 2015](#)). The crux is to undertake the investment with the objectives in mind to work backwards for the achievement of the required end goal. This concept has been acknowledged in recent years. It is the unifying force that binds all management strategies together ([Bradley, 2016](#)) and is also known as Benefit Realization Management which is employed in the past to enhance the success of Information Technology projects ([Breese, 2012](#)). Accordingly, it has been considered by other industries as well ([Chih and Zwikael, 2015](#)). Even though a considerable amount is spent on projects, most organizations are not adopting this practice. Additionally, BM can serve as a foundation for effective and enhanced organizational performance. ([Zwikael and Smyrk, 2015](#)). It recognizes the project owner as the one who is ultimately responsible for the realization of the benefits derived from the project.. Likewise, the Association of Project Management (APM), [APM \(2011\)](#) has recognized the role of governance in enabling BM. There is a need for a comprehensive mechanism to work out the expected benefits and the process for BM ([PMI, 2016](#)).

When it comes to project management, the decision-makers are responsible for putting organizational strategies into action in light of the mechanisms provided by Transaction Cost Economics (TCE) Theory ([Biesenthal and Wilden, 2014](#)). According to TCE, each economic transaction carries a cost, referred to as the 'transaction cost,' and organizations strive to minimize these costs. ([Williamson, 1979](#)). In the project management context, it describes the contractor and supplier selection process ([Winch, 2001](#)). According to [Williamson \(1979\)](#), TCE requires firms to change their governance structures to reduce transaction costs. It also presupposes a complicated buyer-seller relationship. TCE has an influence on the decisions of the project manager about part outsourcing the project. It also establishes the project's roles and responsibilities. ([Williams, et al., 2010](#)). According to [Ahola, et al. \(2014\)](#), the mechanism of project governance emphasized the application of TCE theory, particularly in the construction sector. TCE suggests that the governance structure should be selected to maximize the value net of both production and governance costs. The suppliers can provide benefits and improved performance because of their area of expertise. [Walker and Kwong Wing \(1999\)](#) argue that TCE provides a theoretical foundation for decision-makers that can be integrated with project management theory and associated organizational models. Scholars have studied the factors for the effective and consistent BM approach in projects and have suggested PG as one of the most significant factors ([Bradley, 2016](#)).

The subsequent sections discuss the basis for hypothesized relationships.

## PG AND PP

PG helps to manage the project progress and permits relevant stakeholders to help in decision-making (Khan, et al., 2021a). It establishes a mechanism that safeguards accountabilities to realize their business case (Zwikael and Smyrk, 2012). Triple constraints, i.e., scope, time, and cost have been acknowledged and have been used as PP criteria by scholars (Sirisomboonsuk, et al., 2018). PG helps organizations to enhance the performance of their projects (APM, 2011). Waris, et al. (2022) have suggested that in public projects, PG allows and helps in PP and enhanced stakeholder management. Hence, the first hypothesis suggests:

H1. PG has a positive relationship with PP.

## PG AND BM

Scholars have been advocating and discussing BM in the current literature on project management (Jenner, 2015). Research studies have acknowledged governance as an enabler for BM (Hjelmbrekke, Lædre and Lohne, 2014). Similarly, APM (2011) has acknowledged the role of governance in BM. Effective governance helps in the implementation and application of BM. Conversely, in the literature, the governance mechanisms that facilitate BM are underexplored (Hesselmann and Kunal, 2014). Hence, BM needs an in-depth study and comprehensive mechanism to work out the expected benefits, align them with the needs of the stakeholders, and also incorporate the essential changes to enable the process for BM (PMI, 2016).

Thus, H2. PG and BM have a positive relationship.

## BM AND PP

BM practices can be examined by their effect on PP. It allows organizations maximum gains from project investments (PMI, 2016). According to Bradley (2016), BM is a tool to define project needs and acceptance criteria, as well as identify risks, engage relevant stakeholders, and monitor the BM. Benefits enable achieving the investment objectives for undertaking the project (Coombs, 2015), and it becomes an essential facet of PP (Cooke-Davies, 2002). In the wider context, to ensure the PP, BM needs to be employed along with other programs and portfolio management. Serra and Kunc (2015) have suggested that the integration of BM strategy into the corporate governance processes helps organizations to increase their ability to define and manage their success criteria. Zwikael and Smyrk (2011) stressed establishing a governance structure to maintain the focus of projects on achieving the expected outcomes.

Thus, H3. BM and PP have a positive relationship.

## MEDIATING ROLE OF BM

As postulated earlier, in line with the different empirical studies, PP and PG have a positive relationship (Joslin and Müller, 2016). Also, the researchers emphasized adoption and implementation of BM practices through PG (Zwikael and Smyrk, 2015). Scholars have highlighted the role of BM in enhancing PG (Serra and Kunc, 2015). According to Doherty (2014), the success factors are interdependent, and they may operate in a balancing approach. Thus, in line with the above discussion, the fourth, mediation hypothesis is suggested:

H4. BM mediates the relationship between PG and PP.

This study has drawn the critical PG dimensions from the literature to construct its relationship with the mediating factor of BM. The PG consists of three observed variables; portfolio direction (PD), sponsorship,

effectiveness and efficiency (SEE), and disclosure and reporting (DR) (Sirisomboonsuk, et al., 2018). As PG is involved in project performance, many scholars and practitioners have argued that poor project performance is due to the lack of project governance. They have recommended PG for enhanced PP (Sirisomboonsuk, et al., 2018). Effective BM mechanisms can improve PG, but these mechanisms are underexplored in the literature (ul Musawir, et al., 2017).

Thus, the researchers have mediated the BM with the relationship of constructs of PG and PP, the dimensional hypotheses are suggested as:

- $H_{4a}$ : The relationship between PD and PP is mediated by BM.
- $H_{4b}$ : The relationship between SEE and PP is mediated by BM.
- $H_{4c}$ : The relationship between DR and PP is mediated by BM.

### CONCEPTUAL MODEL

At the project level, the decision-makers are responsible for implementing the organizational strategies in the light of mechanisms provided by TCE (Biesenthal and Wilden, 2014). TCE has an influence on the decisions of the project manager about partially outsourcing the project. Consequently, it also forms the roles and responsibilities in the project (Williams, et al., 2010). According to Leiblein (2003), TCE posits that firms having inappropriately aligned transactions will suffer unfavourable performance consequences. TCE provides rigour to organization theory by giving the analytical framework for identifying hypotheses for empirical work (Walker and Kwong Wing, 1999). The researchers emphasized adoption and implementation of BM through PG (Badewi, 2016).

Thus, in line with the above discussions, the conceptual model in Figure 1 depicts all the hypothesized relationships.

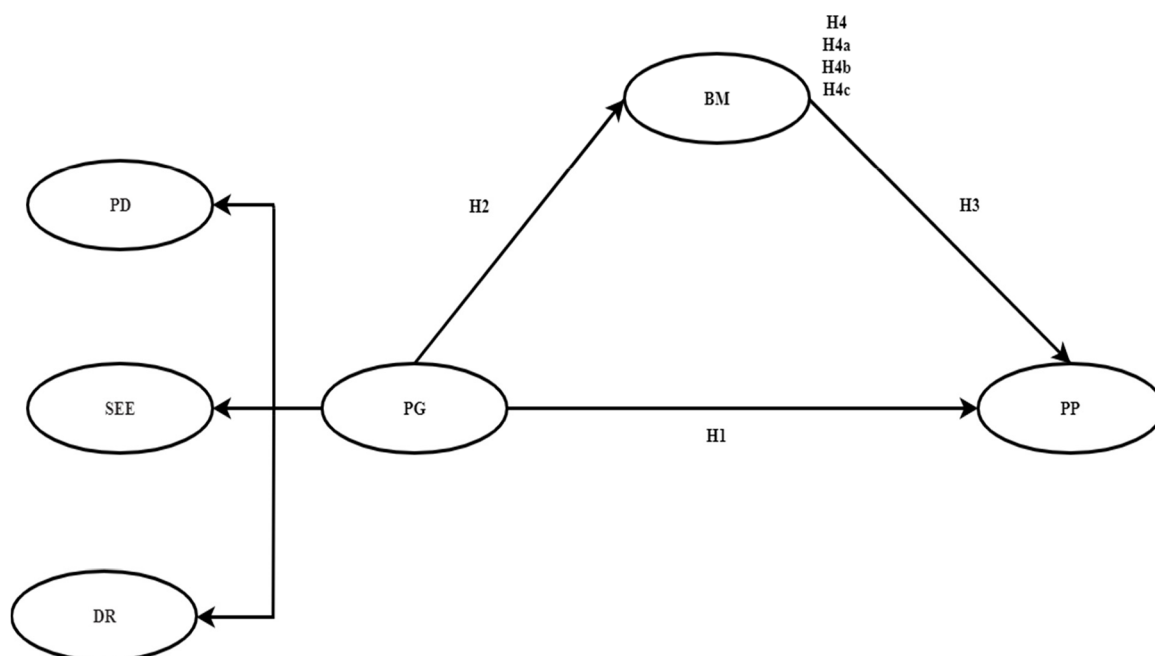


Figure 1. Conceptual model

## MEASUREMENT OF VARIABLES

Items are adapted to measure each construct/variable. The main variables of this study are PG, BM and PP. The dimensions/constructs of PG are PD, SEE and DR. The Survey instrument and constructs are customized according to the working environment of Pakistan. Measurement of the variables is shown in [Table 1](#), [Table 2](#) and [Table 3](#) respectively. These tables summarize the adapted indicators/operating variables.

Table 1. PG

Constructs	Observed variables	References
PD	Q40: portfolio are aligned; Q41: portfolio contains a high value; Q42: the breakdown of spending reflects organizational strategy; Q43: portfolio of new projects has an excellent balance; Q44: appropriate number of new infrastructure projects available.	<a href="#">(Khan, et al., 2021a)</a>
SEE	Q45: stronger project leader/teamwork; Q46: the amount of administrative activity; Q47: leadership; Q48: support from organizational management; Q49: unfair treatment of the project.	<a href="#">(Khan, et al., 2021a)</a>
DR	The communication is: Q50: Timely; Q51: accurate; Q52: adequate; Q53 complete; Q54: credible	<a href="#">(Khan, et al., 2021a)</a>

Table 2. BM

Construct	Observed variables	References
BM	Q55: Target outcomes; Q56: measurable value created; Q57: clearly defined strategic objectives; Q58: An approved business case describing all outputs; Q59: outputs/outcomes of project reviewed; Q60: stakeholders awareness about the results; Q61: adhered actual project outcomes; Q62: incorporation of project outputs into the regular business; Q63: organization kept monitoring project outcomes after the closure of project ; Q64: pre-planned, regular process performed by organization Q65: BM strategy applied in project; Q66: project BM strategy is under analysis.	<a href="#">(ul Musawir, et al., 2017)</a>

Table 3. PP

Construct	Observed variables	References
PP	Q67: Efficiency; Q68: schedules; Q69: budgets; Q70: Amount of produced work; Q71: Quality; Q72: goals.	<a href="#">(Khan, et al., 2021a)</a>

The survey is comprised of different sections representing the items of each construct. Each item is measured on a 5-point Likert-type scale.

## Research Methods

For this study, a quantitative approach was adopted to address the different facets. The cross-sectional time horizon option was chosen to conduct the quantitative aspect of the study. The main data collection method was a questionnaire survey that was administered among professionals of the public sector organizations. In this study, the questionnaire was designed primarily to obtain quantitative data with an ample opportunity provided for the respondents to make comments to incorporate any information which may have been missed by the questions. A structured questionnaire was used to collect quantitative data and to test the hypotheses. The researchers accessed the entire population of the study. The total population of the study is 1009 employees. This number were provided by the responsible officers of the relevant departments. The unit of analysis for the study is the professionals of the Planning Commission of Pakistan (PC), Islamabad. PC is responsible for sponsoring, approving, and monitoring government-sponsored projects in Pakistan.

In this study, AMOS-SEM has been applied for data analysis. According to [Hair, et al. \(2009\)](#), 300 is a good sample size in SEM. However, in the past, [Hair, et al. \(1998\)](#) have recommended a sample size of 200 to test the model using SEM because this sample size can be used in any standard estimation procedure for valid results. This study is confirmatory in nature and aims for a model fit which makes covariance-based structural equation modelling (CB-SEM) a more appropriate analysis method. CB-SEM is mostly preferred over PLS-EM when researchers aim for testing an existing theory. This is in contrast with the usage of PLS-SEM which is deemed appropriate for exploratory research and prediction purposes. As mentioned earlier, this study is confirmatory, moreover; there were ample responses, the data set followed the normality assumptions and no formative constructs were included in the model ([Hair, et al., 2019](#)). Therefore, the researchers preferred CB-SEM over PLS-SEM and the analysis was conducted using the software package AMOS.

Simple random sampling was followed in this research. The researcher selected a sample size of 300 to meet the requirement. A questionnaire was mailed to project professionals of PC. In pretesting the response rate was 50%. Therefore, the sample size was inflated 50%, i.e., 450, to get the required sample size of 300. Out of 450, 350 responses were obtained. 50 responses were discarded due to missing values and inadequate answers. A sample of 300 was used for the analysis. Results of the pilot test showed that the values of the items are within the range of 0.710 to 0.871, which gives confidence about the instrument. According to [Hair, et al. \(2010\)](#), the acceptable value for Cronbach's coefficient alpha is 0.5 and values greater than 0.70 are highly satisfactory.

## Data Analysis

The respondents were gazetted officers in the Planning Commission of Pakistan who have satisfactory working experience ranging from 5 years to more than 15 years. The survey shows that 60% of the respondents were Master's Degree holders. Qualifications having M.Phil and PhD were 35% and 5 % respectively. Also, 82 % of male and 18% of female professionals participated in the survey. This demographic information reveals that respondents have a good academic background, relevant work experience, and representative gender ratio for providing sufficient details and inputs for the outcome of this research work. Thus, their views are important and valuable to establish the findings.

Structural model testing was performed using AMOS, which indicated how the latent constructs are related. According to [Hair, et al. \(2010\)](#), the structural model describes the dependence relationships between hypothesized constructs of the model. The underlying directional relationships among PG, BM and PP were examined through path analysis. R-square measures and statistical significance of the path coefficients were used to test the structural model. The standardized paths should be at least 0.20 and ideally above 0.30 to be considered meaningful ([Chin, 1998](#)). According to [Kline \(2011\)](#), the standardized path

coefficients having values close to 0.10 or above can be interpreted as a small effect, values close to 0.30 should be considered as a medium effect and close or above 0.50 has a large effect. However, in business research, endogenous latent variables are considered good when the R-square value is 0.20 and above (Hair, et al. 2010). Findings show that the overall indices for assessing the model fit are within the recommended range. Table 4 shows the summary of the model fit indices for the structural model.

Table 4. Model fit indices of the Structural Model

Category	Index	Level of acceptance	Obtained
Absolute fit	Chisq	P > 0.05	1109.663
	RMSEA	RMSEA < 0.08	0.076
	GFI	GFI > 0.90	0.89
Incremental fit	AGFI	AGFI > 0.90	0.91
	CFI	CFI > 0.90	0.90
	TLI	TLI > 0.90	0.91
	NFI	NFI > 0.90	0.89
Parsimonious fit	Chisq/df	Chi square/ df < 5.0	2.983

Results show that the overall indices for assessing the model fit are acceptable and within the recommended range (Zainudin, 2012). Thus, the hypothesized three-factor CFA model fits the sample data very well. The structural model in Figure 2 depicts the relationships between PG, BM and PP.

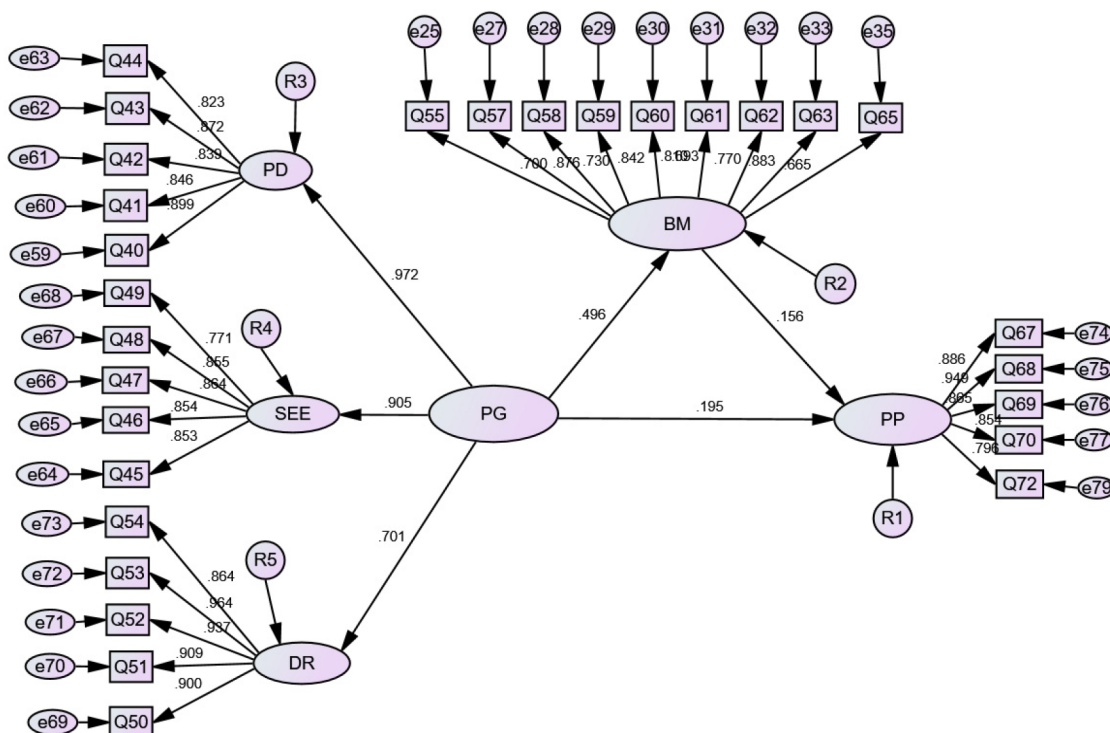


Figure 2. Structural Model



### MEDIATING ROLE OF BM ON PG AND PP

Results from a mediation analysis in [Table 5](#) and [Table 6](#) show that PG is indirectly linked with PP through the relationship of BM. The direct path is shown through “c” ( $c = 0.250, p = 0.0001$ ), indicating a stronger relationship between PG and PP. The indirect path consists of two steps; path “a” and path “b.” Results of path “a” indicated that PG has strong positive influence on BM ( $a = 0.496, p = 0.0001$ ) and this positive amount of BM subsequently shifts to PP as indicated in path “b” ( $b = 0.156, p = 0.0001$ ). Now the relationship of PG and PP in the presence of mediator “BM” was tested and reported in the diagram through the notation of “c’.” This indirect relationship was also significant, which showed the partial mediation of BM in the main relationship. Further, bootstrap 95% confidence interval based on 5000 bootstrap samples indicated that indirect effect ( $ab = 0.078$ ) was completely above than zero (0.037-0.121). These findings confirm the role of BM as a mediator in the relationship between PG and PP.

Table 5. Effect of PG on PP

Path	Variables	Beta Estimates	S.E	C.R.	P-Value	LLCI	ULCI	Result
Path (a)	PG → BM	0.496	0.038	10.612	0.0000	0.332	0.484	Significant
Path (b)	BM → PP	0.156	0.054	3.589	0.0004	0.087	0.297	Significant
Indirect (c’=)	PG → PP	0.195	0.041	4.612	0.0000	0.091	0.250	Significant
Direct (c)	PG → PP	0.250	0.036	7.473	0.0000	0.110	0.274	Significant

Table 6. Bootstrap results

	Effect	Boot SE	Boot LLCI	Boot ULCI
(BM) Indirect effect of PG on PP	0.078	0.021	0.037	0.121
(BM) Completely standardized indirect effect of X on Y	0.115	0.030	0.054	0.175

[Figure 3](#) reflects both types of relationships; direct and indirect. The direct path is shown through “c” whereas the indirect path is shown through “c’.”

### MEDIATING ROLE OF BM ON PD AND PP

Results from a mediation analysis in [Table 7](#) and [Table 8](#) show that PD is indirectly linked with PP through the relationship with BM. The direct path is shown through “c” and the value ( $c = 0.250, p = 0.0001$ ), confirming a strong relationship between PD and PP. The indirect path is consisting of two steps; path “a” and path “b.” Results of path “a” indicated that PD has strong positive influence on BM ( $a = 0.384, p = 0.0001$ ) and this positive amount of BM subsequently shifts to PP as indicated in path “b” ( $b = 0.207, p = 0.0001$ ). Now the relationship of PD and PP in the presence of mediator “BM” was tested and reported in the [Figure 4](#) through the notation of “c’.” This indirect relationship was also significant, which showed the partial mediation of BM in the main relationship. Further, bootstrap 95% confidence interval based on 5000 bootstrap samples indicated that indirect effect ( $ab = 0.080$ ) was completely above than zero (0.042-0.119). These findings confirm the role of BM as a mediator in the relationship between PD and PP.

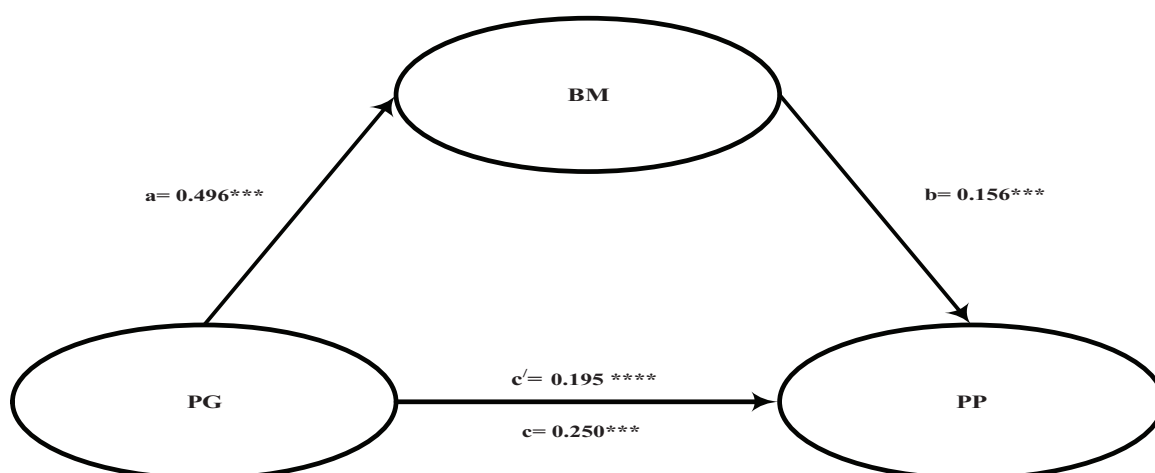


Figure 3. Effect of PG on PP

Table 7. Effect of PD on PP

Path	Variables	Beta Estimates	S.E	C.R.	P-Value	LLCI	ULCI	Result
Path (a)	PD → BM	0.384	0.038	10.150	0.0000	0.310	0.458	Significant
Path (b)	BM → PP	0.207	0.053	3.900	0.0001	0.103	0.312	Significant
Indirect (c')	PD → PP	0.170	0.040	4.230	0.0000	0.091	0.250	Significant
Direct (c)	PD → PP	0.250	0.036	7.034	0.0000	0.180	0.320	Significant

Table 8. Bootstrap results

	Effect	Boot SE	Boot LLCI	Boot ULCI
(BM) Indirect effect of PD on PP	0.080	0.020	0.042	0.119
(BM) Completely standardized indirect effect of X on Y	0.120	0.029	0.064	0.177

Figure 4 reflects both types of relationships, the direct and indirect relationship between PD and PP. The indirect path consists of two steps; path “a” and path “b” whereas, the direct path is shown through “c” and the indirect path is shown as “c’”.

#### MEDIATING ROLE OF BM ON SEE AND PP

Results of Table 9 and Table 10 show that SEE is indirectly linked with PP through the relationship of BM. The direct path “c” having value,  $c = 0.365$ ,  $p = 0.0001$  indicates a strong relationship between SEE and PP. Results of path “a” shows that SEE is having strong positive influence on BM ( $a = 0.467$ ,  $p = 0.0001$ ) and this positive amount of BM subsequently shifts to PP as indicated in path “b” ( $b = 0.154$ ,  $p = 0.0033$ ). Now the relationship of SEE and PP in the presence of mediator “BM” was tested and reported in the Figure 5 through the notation of “c’.” This indirect relationship was also significant, which showed the partial mediation of BM in the main relationship. Further, bootstrap 95% confidence interval based on 5000

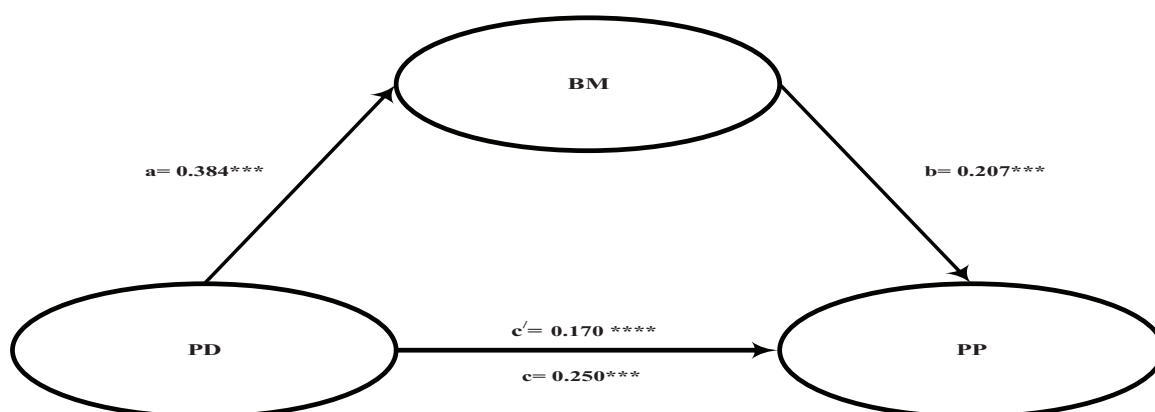


Figure 4. Effect of PD on PP

bootstrap samples indicated that indirect effect ( $ab = 0.072$ ) was completely above than zero (0.027-0.117). These findings confirm the role of BM as a mediator in the relationship between SEE and PP.

Table 9. Effect of SEE on PP

Path	Variables	Beta Estimates	S.E	C.R.	P-Value	LLCI	ULCI	Result
Direct (a)	SEE → BM	0.467	0.045	10.416	0.0000	0.378	0.555	Significant
Direct (b)	BM → PP	0.154	0.052	2.967	0.0033	0.052	0.256	Significant
Indirect (c')	SEE → PP	0.293	0.047	6.264	0.0000	0.201	0.385	Significant
Direct (c)	SEE → PP	0.365	0.041	8.989	0.0000	0.285	0.444	Significant

Table 10. Bootstrap results

	Effect	Boot SE	Boot LLCI	Boot ULCI
(BM) Indirect effect of SEE on PP	0.072	0.023	0.027	0.117
(BM) Completely standardized indirect effect of X on Y	0.091	0.029	0.034	0.148

Figure 5 depicts both types of relationships, i.e. direct and indirect relationships between SEE and PP. The indirect path consist of two steps; path “a” and path “b” whereas, the direct path is shown through “c” and the indirect path is shown as “c’”.

#### MEDIATING ROLE OF BM ON DR AND PP

Results Table 11 and Table 12 show that DR is indirectly linked with PP through the relationship of BM. The direct path “a” indicated that DR has strong positive influence on BM ( $a = 0.244$ ,  $p = 0.0001$ ) and this positive amount of BM subsequently shifts to PP as indicated in path “b” ( $b = 0.302$ ,  $p = 0.0001$ ). Now the relationship of DR and PP in the presence of mediator “BM” was tested and reported in the Figure 6 through the notation of “c’.” This indirect relationship was insignificant. This shows the full mediation of BM in the relationship between DR and PP. Further, the bootstrap 95% confidence interval based on 5000

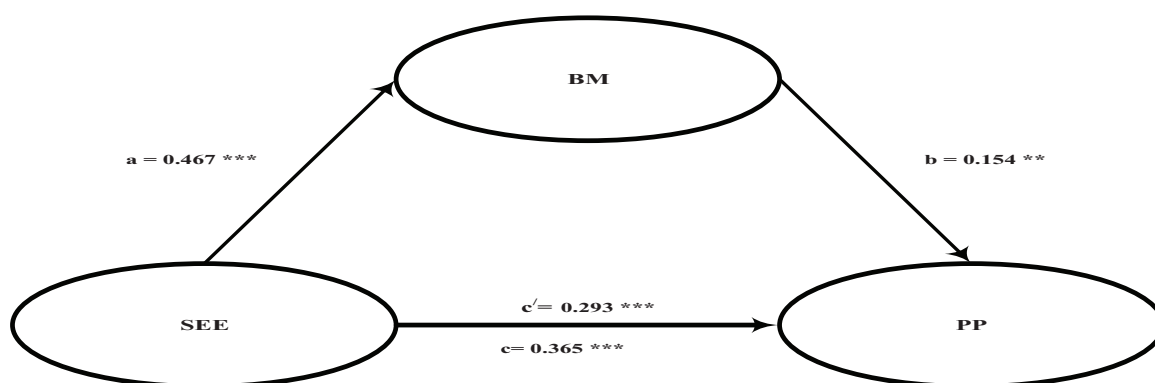


Figure 5. Effect of SEE on PP

bootstrap samples indicated that the indirect effect ( $ab = 0.074$ ) was completely above zero (0.038- 0.114), which showed the full mediation of BM in the main relationship. These findings confirm the role of BM as a mediator in the relationship between DR and PP.

Table 11. Effect of DR on PP

Path	Variables	Beta Estimates	S.E	C.R.	P-Value	LLCI	ULCI	Result
Direct (a)	DR → BM	0.244	0.054	4.488	0.0000	0.137	0.351	Significant
Direct (b)	BM → PP	0.302	0.049	6.224	0.0000	0.207	0.398	Significant
Indirect (c')	DR → PP	0.074	0.047	1.564	0.1189	-0.019	0.166	Insignificant
Direct (c)	DR → PP	0.147	0.048	3.047	0.0025	0.052	0.242	significant

Table 12. Bootstrap results

	Effect	Boot SE	Boot LLCI	Boot ULCI
Indirect effect of DR on PP	0.074	0.019	0.038	0.114
Completely standardized indirect effect of X on Y	0.087	0.023	0.045	0.135

Figure 6 shows the direct and indirect relationship between DR and PP. The indirect path consists of two steps; path “a” and path “b” whereas, the direct path is shown through “c” and the indirect path is shown as “c’”.

## HYPOTHESES TESTING

Table 13 shows a summary of the hypotheses’ results. In this research, 7 hypotheses were tested, of which 6 were accepted. The results show significant relationships among the predicted links.

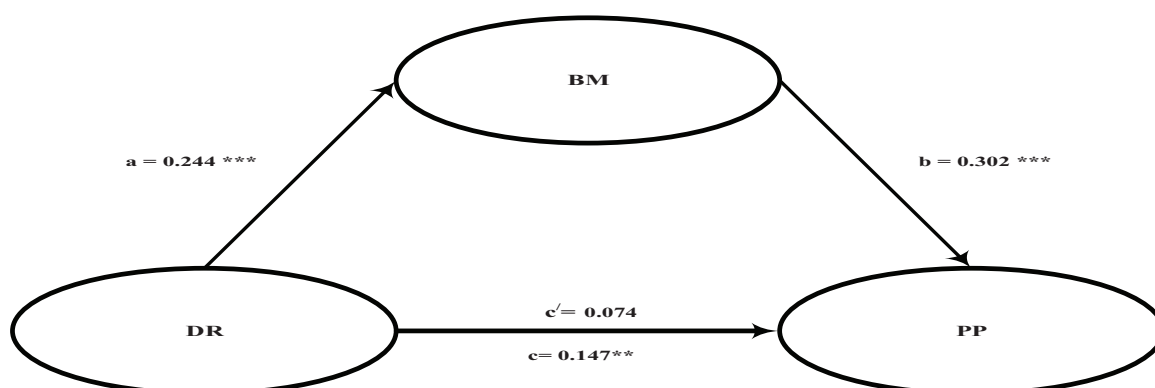


Figure 6. Effect of DR on project PP

The value ( $\beta = 0.250$ ,  $p = 0.0001$ ) for direct relationship reveals a strong relationship between PP and PP, which provides support for H1.

The relationship between PG & BM is significant ( $\beta = 0.496$ ,  $p = 0.0001$ ), provides support for H2.

Hypothesis H3 is supported as the direct relationship between BM & PP is significant ( $\beta = 0.156$ ,  $p = 0.0004$ ). The findings of mediation analysis indicate that PG is directly and indirectly linked with PP through BM, which confirms that BM is a mediator between PG and PP. A positive relationship between PG and PP is mediated by BM, where the direct relationship is significant ( $\beta = 0.195$ ,  $p = 0.0001$ ), which provides support for H4: *BM mediates the relationship between PG and PP*. It is Partial mediation as well. The findings indicate that in mediating the relationship of BM with the dimension of PG. 1<sup>st</sup> sub hypothesis i.e., H4a: *BM mediates the relationship between PD and PP* ( $\beta = 0.170$ ,  $p = 0.0001$ ) and 2<sup>nd</sup> sub hypothesis H4b: *BM mediates the in the relationship between SEE, and PP* ( $\beta = 0.293$ ,  $p = 0.0001$ ) are supported. The 3<sup>rd</sup> sub hypothesis H4c: *BM mediates in the relationship between DR and PP* was not supported, where the relationship of DR and PP in the presence of mediator “BM” was insignificant ( $\beta = 0.074$ ,  $p = 0.1189$ ) showing full mediation. However, still, overall BM mediates in the relationship between PG and BM.

Table 13. Hypotheses results

Sr.	Hypotheses	Summary results	Supported / not supported
1	H <sub>1</sub> :	( $\beta = 0.250$ , $p = 0.0001$ ) significant	Supported
2	H <sub>2</sub> :	( $\beta = 0.496$ , $p = 0.0001$ ) significant	Supported
3	H <sub>3</sub> :	( $\beta = 0.156$ , $p = 0.0004$ ) significant	Supported
4	H <sub>4</sub> :	( $\beta = 0.195$ , $p = 0.0001$ ). It's Partial mediation as well.	Supported
5	H <sub>4a</sub> :	( $\beta = 0.170$ , $p = 0.0001$ ) significant	Supported
6	H <sub>4b</sub> :	( $\beta = 0.293$ , $p = 0.0001$ ) significant	Supported
7	H <sub>4c</sub> :	( $\beta = 0.074$ , $p = 0.1189$ ). insignificant (Full mediation)	Not supported

## Discussion

To pursue the first research question, the researchers investigated the relationship between PG and PP. The results of the study indicate that PG is directly linked with PP. The reported value was significant ( $c = 0.250$ ,  $p = 0.0001$ ), that confirms the PG and PP relationship.

A review of the literature indicates that project governance is emerging as a new paradigm for the enhancement of project performance as it influences performance through different mechanisms. The conceptual model in [Figure 1](#) shows the relationship between the two concepts. A link has been predicted between PG and PP. The results in [Table 4](#) provide evidence that PG shares ties with PP. These findings are in line with the literature that PG has a positive impact on PP ([APM, 2015](#)). As public sector projects in Pakistan are not performing well, an operational strategy, PG is suggested to accomplish enhanced PP ([Khan, et al., 2019](#)). To apply PG for enhanced PP, public sector organizations need to redesign their criteria by incorporating other relevant dimensions to increase their value creation ([Ismail, et al., 2019](#); [Khan, et al., 2021a](#)).

To answer the second research the relationship between PG, BM and PP was investigated. The findings of the study show that BM has a partial mediation effect in the relationship between PG and PP. Further, the BM was also mediated with the dimensions of PG i.e., PD, SEE, DR and PP. The indirect relationship between PG and PP was also significant ( $c = 0.195$ ,  $p = 0.0001$ ) which showed the partial mediation of BM in the main relationship.

Further, the bootstrap 95% confidence interval based on 5000 bootstrap samples indicated that the indirect effect ( $ab = 0.078$ ) was completely above zero (0.037–0.121), which also confirms the benefit management as a mediator. The result supports the propositions of some scholars that PG is a new paradigm of PG that helps to improve PP ([Khan, et al., 2021a](#)). The findings of dimensional results suggest that the project professionals should emphasise three dimensions of PG to enhance PP.

Many studies have identified governance as an enabler for benefit management ([Hjelmbrekke, Lædre and Lohne, 2014](#)). Furthermore, according to [ul Musawir, et al. \(2017\)](#), effective governance can play a role in the adoption and implementation of benefit management. Hence, project governance is essential for effective benefit management. Given this, the link between project governance and benefit management was investigated. The hypothesis states,  $H_2$ : *There is a positive relationship between PG and BM*. The findings of this study confirm the link between PG and BM and thus support the hypothesis. The results indicate that there is a significant positive relationship between PG and BM. It provides empirical support to the understandings of numerous studies that have advocated that PG facilitates the implementation of BM practices ([Jenner, 2014](#)). A proper PG mechanism can play a substantial role in resolving the issues. Top management support is essential to facilitate the BM process by aligning project benefits with organizational strategy ([Hjelmbrekke, Lædre and Lohne, 2014](#)).

BM was applied in the projects. It has a positive impact on PP as it helps organizations to maximise returns on investments in projects ([PMI, 2016](#)). BM serves as a tool to define project needs, identify risks, engage relevant stakeholders and help in achieving project objectives ([Bradley, 2016](#)). [Cooke-Davies \(2002\)](#) has suggested BM as an important facet of PP, and according to [Badewi \(2016\)](#), it has a positive impact on project investment success. Likewise, [PMI \(2016\)](#) also recommended BM as a positive practice for project management performance and project investment. Given this, the link between BM and PP was investigated. The hypothesis states,  $H_3$ : *There is a positive relationship between BM and PP*. The findings of the study indicate that BM has a significant positive effect on PP, which corroborates the findings of the literature that BM has a relationship with PP ([Serra and Kunc, 2015](#); [Badewi, 2016](#)). Successful delivery and performance of the public sector projects are important to realize their intended benefits to the citizens. Most public sector projects are complex to deliver. The leading causes of failure of projects are; ambiguous objectives, lack of resources, and over-ambitious costs and schedule ([IPA, 2017](#)). These mistakes have an

impact on the amount of the realized benefits and can be avoided by tackling them at the early stages of the projects. BM helps in the successful delivery of the projects (IPA, 2017). BM practices have been linked to some of the dimensions of success, which are also significantly associated with the overall perception of success and performance in the context of project management performance (Serra and Kunc, 2015). Therefore, there is a need for an in-depth study for better application of benefit management.

#### MEDIATING ROLE OF BM

As discussed in the previous section, there is a positive and direct relationship between PG and PP, and scholars have also emphasized adoption and implementation of BM practices through PG (Badewi, 2016). BM can improve PG and PP (ul Musawir, et al., 2017). Thus, in line with the above discussion, the fourth, mediation hypothesis suggests *H4. BM mediates the relationship between PG and P*. BM was also found to mediate the relationship between the three constructs of PG and PP. The three constructs/observed variables of PG i.e., PD, SEE and DR have been drawn from the literature (Sirisomboonsuk, et al., 2018; Khan, et al., 2021a). Many scholars and practitioners have argued that poor project performance is due to the lack of PG and they have recommended PG for enhanced PP (Sirisomboonsuk, et al., 2018). The aim to investigate the mediating role of BM on the relationship between the observed variables of PG and PP was to explore the underexplored mechanism and to improve the project performance as well. Therefore, and in line with the literature, in this study, the researcher has mediated the BM with the relationship of constructs of PG and PP.

One of the central notions of this study is that PG and BM practices help in enhancing project performance. The findings of the study support this view as BM was partially mediated in the relationship between PG and PP, which indicates that PG and BM, together would encourage PP (ul Musawir, et al., 2017). One of the possibilities of positive results might be the respondents' academic qualification and relevant work experience. It may indicate the level of understanding of the concepts of PG and BM practices. Further, the BM was also mediated in the relationship between the three constructs/dimensions of PG and PP. The result supports the propositions of the scholars that PG helps to improve PP (Crawford, et al., 2008). The findings suggest that public sector organizations should also emphasize the dimensions of PG to enhance project performance. Khan, et al. (2021a) have also suggested emphasizing the dimensions of PG.

The full mediation of BM in relation of DR & PP shows that this mediating path is stronger than the direct path. It is very pertinent to work on the DR to improve the project governance in public sector programs in developing countries in general and in Pakistan in particular. In Pakistan, one of the major reasons for the project delays, project failure, and poor performance of public sector projects is the unsatisfactory reporting system (Khan, et al., 2021b). Where the official documents have to follow prescribed steps through different administrative layers (Khan, et al., 2021a; Waris, et al., 2022). Due to the bureaucratic organizational structure, the delays in the approval process are sometimes surprisingly long, and even important messages are not circulated appropriately from top management to project managers. There are numerous underutilized projects which are considered as completed projects, but they could be possibly utilized in a better way if managed by the beneficiaries (Ayat, et al., 2021). The findings of the study suggest an alternative mechanism to boost the relationship of DR through BM, which will improve the PG further, thus improving the performance of the projects.

As PG is an essential constituent BM approach, and it is also the driver for the BM process, it can be concluded that PG enables and supports BM practices. This assessment and understanding are also supported by the leading industry standards i.e., APM, MSP, PRINCE2, and IPMA.

However, it is suggested that a BM approach must be implemented by project professionals, and it should be embedded into the PG dimensions. This will help to track and review the project benefits and will ensure

the delivery of benefits to the program and line management (OGC, 2009). Organizations having BM orientations have a higher success rate and overall performance (Chih and Zwikael, 2015). Thus, BM can be a mechanism to engage with all the relevant stakeholders and can have a positive impact on PP. Hence, to conclude, BM supported by PG helps to ensure the project investments (Serra and Kunc, 2015). It should be supervised by professionals who are BM-oriented.

## Conclusions

### MAJOR FINDINGS AND PRACTICAL IMPLICATIONS

Public sector infrastructure projects all over the world tend not to meet their objectives, thereby resulting in huge financial losses. Given the growing importance of infrastructure projects on a global scale and a dearth of research on government-sponsored projects, this research explores the interrelationships between PG, BM and PP of infrastructure projects in Pakistan. In doing so, it extends the existing literature on public sector project management by providing insights into the PG mechanism and its integration through the mediation of BM for enhanced PP.

First, this study examined the relationship between PG and PP and revealed that PG has a positive direct relationship with the performance of public sector infrastructure projects. This evidence is consistent with prior studies that find a strong relationship between PG and PP. Next, it investigated the mediating role of BM in improving the PP in Pakistan. Empirical results show that PG is directly and indirectly linked with PP through BM, which confirms BM as a mediator in the relationship between PG and PP. Specifically, BM was found to mediate the relationship between the three constructs of PG and PP. Overall, research concludes that BM supported by PG enhances the performance of infrastructure projects.

These findings stress the need for a comprehensive BM approach for improving the project performance of government-sponsored projects. This is important given the fact that a large number of organizations do not recognize project benefits as a criterion for project performance. In addition, the results of this study enhance the understanding of project managers about the role and significance of PG to improve project performance through BM. This should facilitate the adoption of effective BM practices, thereby providing much-needed support for all stakeholders who are engaged in PG and are striving to improve the performance of infrastructure projects. This study, therefore, is expected to serve as a roadmap in identifying the issues, together with the factors that hinder the performance of public sector infrastructure projects. The foremost theoretical contribution of this research is the mediation that identifies benefit management as the process through which project governance improves project performance. The originality of this research lies in its treatment of mediation of benefit management to demystify the relationships between variables of project governance and project performance. This study has attempted to improve the understanding of project professionals about the significance of benefit management. It will also assist policymakers to identify the issues, together with the factors that hinder attaining improved project performance.

### LIMITATIONS AND FUTURE DIRECTIONS

This study has some limitations, as the findings have been developed from the feedbacks of the survey, which are liable to recall and may cause errors. The indicators for measuring various constructs are the results of self-reporting. While self-reporting is common, it could have been improved by asking questions in a longitudinal field study. Furthermore, the PP could have been assessed through some definite organizational evaluations.

The future researcher can expand this study to other countries, regions and also look at other aspects like legal or political environments. Further, qualitative research is required to develop a PG framework



that better explains the governance mechanism for project-oriented organizations. Moreover, government institutions may encourage the adoption of benefit management with the support of top management. With this, managers will be encouraged to focus on organisations' strategies and public needs along with project goals.

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