

Received March 7, 2020, accepted April 10, 2020, date of publication April 17, 2020, date of current version May 1, 2020.

Digital Object Identifier 10.1109/ACCESS.2020.2988511

Project Management Maturity and Organizational Reputation: A Case Study of Public Sector Organizations

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This work was supported by the Universiti Putra Malaysia under Grant 9001103.

ABSTRACT Reputation of the public sector organizations has been in the limelight of research since the last few years. It is because a positive reputation attracts foreign direct investment, elevates the trust of the general public in their government, increases the net tax collections and in aggregate improves the image and identity of the country. The aim of the present study is to propose and evaluate a research model that includes project management maturity as an antecedent to organizational reputation. The suggested research model is assessed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Furthermore, the hypotheses generated in the study were examined based on a sample of 425 respondents from the project-based public sector organizations of Pakistan. Moreover, the findings indicate that there is a significant positive relationship between maturity in project management and reputation of public sector organizations. Additionally, it is determined from the findings of the study that different dimensions of project management maturity such as process management, project management training, knowledge management transfer, continuous improvement and the use of project management software positively affect the reputation of the public sector organizations in Pakistan.

INDEX TERMS Organizational reputation, project management maturity, public sector organizations, public policy, projects.

I. INTRODUCTION

Organizations in the current globalised world continuously seek ways to stay competitive, make profits and to contribute back to society. The intangible assets of organizations, such as brands, copyrights and patents, are among the few assets that guarantee financial returns and produce significant outcomes [1]–[3]. Likewise, one of the valuable intangible assets for organizations is organizational reputation. Furthermore, it is determined that a strong reputation may result in a competitive advantage to organizations. Reputation is a general term used in both public and private organizations, and it is

commonly understood as the perception of the stakeholders that is shaped by the products and services offered by organizations [4].

Several advantages have been associated with having a positive reputation in both public and private organizations [5]–[8]. The reputation of a public sector organization is more crucial because it helps in shaping the overall reputation of a country. According to Reputation Institute, countries having a strong reputation can attract foreign direct investment (FDI), a highly skilled workforce, tourists, and being able to sell the products and services of the country abroad [9]. One of the criteria of Reputation Institute for rating the countries was how well the public sector organizations were performing in the underlying countries.

The associate editor coordinating the review of this manuscript and approving it for publication was Jenny Mahoney.

Therefore, public sector organizations have started to realise the value of reputation, as many of its effects are crucial for their survival. A positive reputation of an organization among the stakeholders is understood as reputational capital [10]. Furthermore, he states that a positive reputation will contribute to added employee loyalty, easier recruitment, a basis for the legitimacy of the organization and reduced transaction costs.

In Pakistan, the reputation of public sector organizations is predominantly negative, due to the poor performance of the government policies and projects causing discontent among the public and other stakeholders. According to Reputation Institute, Pakistan has fallen into the lowest tier consecutively for five years (2011-2016) and has been considered as a poor performer in its public sector organizations [9]. Similarly, a survey was conducted by the BBC in 2014 about country ratings, Pakistan was rated as the second worst country, after Iran, due to its poor performance on the public sector projects [11]. Likewise, Pakistan has been rated at 56th position among 60 countries in the U.S. News Best Countries Ranking 2016 for investment. The Index of Economic Freedom in 2016 considered the public sector institutions in Pakistan as highly unstable where volatile economic turbulence discourages foreign investment. This disastrous course for reputation needs to be rectified [12].

Establishing an organizational reputation from the stakeholders' perspective is, therefore, essential for public sector organizations. Moreover, research regarding the factors that determine reputation has become important for many academicians [13], [14], organizations [15] and countries [16]. Consequently, studies have focused on corporate social responsibility, corporate governance, firm age and managerial styles [17]–[19] for the development of reputation.

Apart from the traditional measures used for developing an organizational reputation, studies have also observed that different aspects of projects and project management can improve the reputation of organizations. Successful results on projects [20], sustainability [21] and organizational project management maturity [22] have been associated with the organizations reputation. However, it has been observed that the former two variables, i.e. sustainability and project success have a significant effect on the reputation of organizations in the context of Pakistan. Whereas, the effect of project management maturity on the reputation of public sector organizations remains unclear and has not yet attracted the attention of academia and practitioners in Pakistan.

Thus, the major objective of this study is to put forward a conceptual model comprising, project management maturity and organizational reputation. Furthermore, this study aims to empirically evaluate the effect of project management maturity and its dimensions namely: i) Project management software, ii) Project management training, iii) Knowledge management & transfer, iv) Continuous Improvement, v) Project Management Awareness and vi) Process Management on the reputation of public sector organizations in Pakistan.

II. LITERATURE REVIEW

A. PUBLIC SECTOR ORGANIZATIONS IN PAKISTAN

Pakistan is a country of almost 200 million people making it the sixth most populated country of the world with a total land area of 796,095 km² and a gross domestic product (GDP) of 305 billion US dollars [23]. Pakistan has a per capita income of 1467 US dollars, it, therefore, lies in the category of lower-middle income developing countries [24]. The Annual budget for 2018-19 is almost 43 billion USD with a GDP growth rate of 5.7 per cent which is the highest in the last decade. Additionally, Pakistan needs to create job and business opportunities for its young population, (64 per cent of the population is below the age of 30, and 29 per cent is between the ages of 15-29 years, UNDP, 2018).

A recent survey of country reputation indicates that Pakistan is facing a severe reputational crisis. Pakistan has been rated as one of the worst countries to travel to and invest in by the residents of the European Union [25]. International media is flooded with negative reports about Pakistan, such as disasters, terrorism, water scarcity and the corrupt political system [25]. In addition, the poor performance of public sector organizations has impeded the global reputation of the country. Due to these reasons, the reputation of Pakistan has successively been placed on the lowest tier of the continuum for the past five years and it is termed as a poorly reputed country [9]. Furthermore, the reputation of public sector organizations is an important asset for a country as it attracts foreign direct investment, highly skilled human resources, access to new markets and customers, and retaining market share [26]–[28]. A wide stream of research can be found about the reputation of private sector organizations, however, contrarily very limited study has been carried out regarding the reputation of public sector organizations in developing countries, such as Pakistan.

B. ORGANIZATIONAL REPUTATION

Reputation is a valuable intangible asset of a company [29] and it is becoming more significant to managers and scholars around the world [30], [31]. The term reputation has its origins in the 1950s when a related concept of the corporate image was developed [32]. Currently, the term reputation has a fuzzy understanding among academicians and practitioners and there is no agreement on the definition so far. Therefore, in this study, a thorough review of the existing literature was conducted and a range of definitions for reputation were discovered.

Traditionally, organizational reputation was defined by [33] as an aggregate of experience of different stakeholders (e.g. employees, people etc.) who interact with the organization. Whereas, [5] argues that the actions and results of organizations are the basis for the development of organizational reputation. Later, [34] the term reputation was defined as the opinion of stakeholders, such as customers, suppliers, employees and competitors about an organization. In the same year, Walsh described reputation as to,

how positively or negatively people evaluate the performance of an organization [35]. Moving forward, it was determined that reputation is the collection of interpretations and perceptions of stakeholders, which they associate to the behaviour, communication and outcomes of the organization [36]. Most recently, organizational reputation is understood as a reflection of collective stakeholder judgments made over time about an organization's communication and actions [37].

With respect to the definitions presented above, it is noteworthy that the most common elements of organizational reputation are the judgements, evaluations and estimations of stakeholders that are developed by the stakeholders as a result of interaction with organizations.

Moreover, reputation matters for several reasons. It is advocated in the literature that organizational reputation is one of the most important assets and causes several promising impacts within different stakeholder groups [38]. Reference [8] asserts that reputation allows organizations to form long-lasting and solid bonds of trust with customers and stakeholders and it enhances an organization's ability to create value. On the other hand, reputation helps corporations to survive in times of economic turbulence and to gain competitive advantage [39].

In parallel, reputation provides prospects to organizations in creating and retaining market share, affecting the opinion of customers and other stakeholder groups [26]. Likewise, firms with good reputations are considered to have (i) higher levels of satisfaction among key stakeholders, such as: investors, employees and customers [40], (ii) financial stability [28], and (iii) loyalty of the customers [41]. A positive organizational reputation can draw market entry barriers for competitors and allows a company to attract new customers [27]. Thus, it can be understood from the discussion that reputation has a number of effects for organizations. On the other hand, most of the literature stated above pertains to the reputation of private organizations. Furthermore, there is a scarcity of literature available on public sector organizations and their reputation's in developing countries, such as Pakistan.

Hence, the question at hand is how to create a positive and reliable reputation? Antecedents, such as financial performance [42], organizational behavior/actions [43] social media use [44] purchase intentions and customer trust [45] have recently been empirically tested with organizational reputation.

Moreover, in the context of Pakistan, it has been suggested that the IT-related industry can improve its reputation by delivering high-quality services and products [46]. In the same way, a study was conducted in Pakistan and it was determined that the reputation of organizations can be enhanced by corporate social responsibility [47]. However, the studies do not provide enough empirical evidence. Additionally, the reputation of the private sector has remained in the limelight in the existing literature, overlooking the reputation of the public sector.

Statements conveying a persistently negative image of public organizations have been heard for many years [48]. Reference [49] postulates that when the public interacts with organizations, reputation is built, and these interactions should be in a favorable way, as this is the basic purpose of public sector organizations. Reference [50] argue that organizational legitimacy is one of the benefits of reputation that compels organizations towards its adoption in the public sector. Furthermore, the general acceptance and the legitimacy of public sector organizations can be affected by reputation. Golgeli advocated that reputation has a direct impact on the success of public sector organizations [51]. In addition, increasing levels of stakeholder expectations and economic pressures are leading public sector organizations to reinvent their reputations [52]. Likewise, in public sector organizations, reputation has received comparatively less attention and that it is not fully understood and needs further investigation [10], [53].

However, for public sector organizations, it is observed from the literature that corporate social responsibility has a positive influence on reputation [13], [54], [55]. Similarly, in Pakistan, factors in project management, such as sustainability [21] and successful results on projects [20] are believed to enhance the reputation of public sector organizations. Additionally, the current literature suggests that if public-sector organizations wish to mend their reputation, they should lay emphasis on project management maturity [20].

C. PROJECT MANAGEMENT MATURITY

Traditionally, maturity was understood as the capability of an organization to manage and monitor communications, quality, development and maintenance [56]. Later on, Kerzner described maturity as the development of structures and processes in organizations which are repetitive by nature, increasing the probability of projects to be successful [57]. Whereas, recently the term maturity is understood as an assessment of an organizations growth, completeness and development in order to successfully manage operations [58]. Simply stated, maturity is the attainment of developmental goals and improvement in every domain of an organization.

On the contrary, project management maturity is interpreted in the literature as the incorporation of project management practices and methodologies in organizations enhancing competencies and skills organization wide [59]. Similarly, project management maturity is understood as the adoption and implementation of a project management approach in the organization, improving the decision-making process [60].

Moreover, project management maturity can be better understood and explained by project management maturity models. Upon scrutiny of the literature, it has been determined that there exists a wide range of maturity models, which have been developed by project management consulting organizations.

D. PROJECT MANAGEMENT MATURITY MODELS

A project management maturity model is a systematic mechanism that allows organizations to excel towards maturity [61].

These Project Management Maturity Models (PMMM's) serve as a reliable and concrete method for organizations to assess different aspects of project management maturity. In addition, the main objective of PMMM's is to allow organizations to compare the involvement of project management standards at different phases of a project [62]. Similarly, the aim of PMMM's is to determine how mature an organization is and what are the available paths for organizations to become more mature [63]. Also, PMMM's guide organizations on how to become more systematic, organized and standardized [60], [64].

On the contrary, PMMM's have gained popularity in recent times as one of the approaches that create value for organizations [65]. Additionally, in a recent study, it was determined that the appropriate use of PMMM's can lead to successful results on projects [66]. Moreover, maturity in organizations is preferable and higher the maturity the better the organizations will perform on projects [67].

The value of PMMM's has been acclaimed by various international project management bodies. In the US, the Project Management Institute (PMI) has created the Organizational Project Management Maturity Model (OPM3) [68]. Whereas, in the UK, the Portfolio, Programme and Project Management Maturity Model (P3M3) is in the process of development by the Ministry of Commerce [69]. Also, project management professional bodies around the world are currently struggling to design and develop PMMM's that will cater to their organizational requirements [70]. Thus, it can be stated here that PMMM's are becoming essential for organizations that wish to create value and improve their project practices.

The most established and widely used maturity models are the Capability Maturity Model (CMM), Kerzner's Project Management Maturity Model (KPMMM) and the Organizational Project Management Maturity Model (OPM3) these are individually discussed in the following sections:

1) CAPABILITY MATURITY MODEL

In the late '80s, the Software Engineering Institute (SEI) in collaboration with Mitre Corp. started the development of a project-maturity framework that would enable developers to improve their processes. In this quest they developed two methods i) software process assessment and ii) a questionnaire that assesses the maturity of the software processes. Over the next five years, the SEI combined the maturity frameworks which resulted in the Capability Maturity Model (CMM). The ultimate purpose of this model was to improve software development and maintenance capabilities. Furthermore, the CMM served as a guide on how to gain control of maintenance processes and achieve excellence in management. Also, the CMM was developed to identify current process maturity and to determine critical issues that could lead to enhanced processes. The first version of the CMM was released in 1991. The potential benefits of the CMM have been acknowledged in a number of studies,

such as i) enhancing productivity [71], ii) better organizational performance [72] and iii) improved project success rates [73].

Moreover, the CMM operates under a five-tier maturity structure which was proposed by the SEI for continuous improvement of the processes in software organizations. These five levels determine the maturity of the process and serve as a guide to prioritize the efforts for improvement. These five levels were i) Initial Level (determining if the processes are disciplined), ii) Repeatable (suggesting if the organization is consistent in following standard practices), iii) Defined (indicating if the processes are predictable), iv) Managed (Ensuring that the processes are in a systematic order), v) Optimising (Indicating if the processes are continuously improving). In the CMM the lowest level, i.e. Initial Level, signifies informal processes and the highest level, i.e. Optimisation Level shows that there are formalised structures, where processes are documented and continuously improving. However, the focus of the first model was the maturity of software processes. Whereas, the application of the CMM is now beyond the domain of software engineering and is also applied in the field of knowledge management and supply chain management innovation networks [74], [75].

2) KERZNER PROJECT MANAGEMENT MATURITY MODEL

Kerzner believed that the simple use of project management knowledge did not guarantee beneficial results to organizations, such as project success [76]. In fact, he argued that it may lead to repetitive mistakes and make problems worse. He further iterated that the foundation for achieving excellence on projects can be best described by project management maturity. Therefore, in an effort to enhance the performance of projects, Kerzner in 2001 proposed a maturity model by the name of the Kerzner Project Management Maturity Model (KPMMM).

His model is an extension of the Capability Maturity Model (CMM) but with different levels of maturity. He described the first level as a Common Language which ascertains whether organizations that deal in projects are able to realise the worth of project management knowledge. His second level of maturity, i.e. Common processes emphasises on process definition and development. The third level of maturity in his model is Singular Methodology suggesting that corporate methodologies should be combined into a singular methodology, and this methodology should revolve around project management knowledge. The fourth level of maturity in his model is Benchmarking, i.e. recognising the importance of process improvement on a continuous basis. Finally, his fifth level of maturity is Continuous Improvement which directs the organization to evaluate the information which is gathered through level four and deciding if this information is helpful in improving the singular methodology. He further iterated that these levels are not mutually exclusive and could overlap or coexist.

TABLE 1. Summary of project management maturity models.

Model	Origin	Target	Description
CMM [56]	Software Engineering Institutes	Software and Services organizations	5 levels - initial, repeatable, defined, managed and optimizing.
KPMMM [76]	Extension of CMM	Project-driven organizations	5 levels - Common Language, common processes, singular methodology, Benchmarking, Continuous improvement
OPM3 [78]	Project Management Institute	Project-driven organizations	4 Levels - Standardize, Measure, Control, Improve

3) ORGANIZATIONAL PROJECT MANAGEMENT MATURITY MODEL

In between 1998 and 2003, the Project Management Institute created the Organizational Project Management Maturity Model (OPM3) to improve project management practices within organizations [77]. The Organizational Project Management Maturity Model incorporates the intellect of the project management community from around the world from a wide range of industries. This model was purely designed to meet the needs of project-based organizations in ascertaining their maturity level. The OPM3 was primarily designed to establish a link between the organizational strategy and the projects of organizations. Additionally, models, such as the CMM and the KPMM focus on process improvement.

Contrary to the CMM and KPMM models, the OPM3 has four stages of maturity, i) Standardise: managing processes and supplementary changes, yielding consistent best practices, ii) Measure: inculcating customer requirements and critical deliverables of projects in the project objectives, resulting in quantifiable outcomes, iii) Control: comparison of the actual results with the planned outcomes, evaluating the variances and identifying room for improvement, v) Improve: implementing and sustaining the process improvements. Moreover, these four levels of maturity in the OPM3 are assessed using a scoring method in the different domains of the organization and organizational enablers.

E. SUMMARY OF PROJECT MANAGEMENT MATURITY MODELS

The project management maturity models have been summarised in Table 1. In this table, we explain the point of origin as well as the targeted audiences for which the maturity models were designed and a brief description of the models ascribing the necessary levels that the organizations should go through to achieve successful results.

F. MEASURING PROJECT MANAGEMENT MATURITY

Vlahov [62], Albrecht and Spang [79] recently combined the main ingredients of the models which are presented in

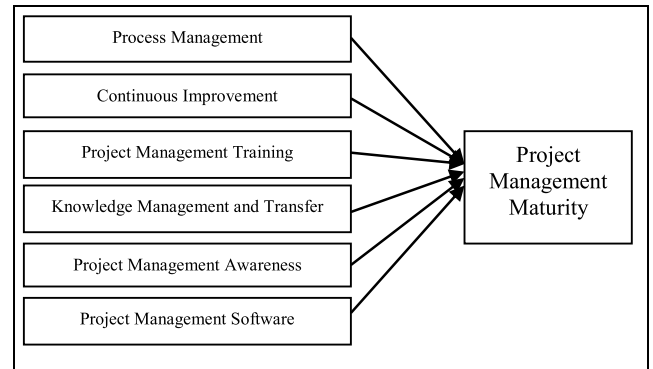


FIGURE 1. Measurement of project management maturity.

Figure 1. They produced a comprehensive list of dimensions (continuous improvement, process management, project management training, knowledge management & transfer, resource project management and project management software) to gauge project management maturity in organizations. Although, the reliability and validity of the questionnaire in the private sector of the developed world are pungent, however, the soundness of the instrument in the public sector of the developing world remains unclear. Therefore, in this study, we will adopt and empirically test the viability of their measurement instrument which is based on the basic principles of the CMM, KPMMM, and OPM3.

G. BRIDGING ORGANIZATIONAL REPUTATION AND PROJECT MANAGEMENT MATURITY

Organizational reputation has been the centre of attention for academicians from different disciplines, such as marketing, management, sociology, accounting, finance, economics, and strategy [80]. Antecedents, such as project success [20], sustainability [21], financial performance [42], organizational behavior/actions [43] social media use [44] purchase intentions and customer trust [45] have recently been empirically tested with organizational reputation. However, these studies did not provide sufficient evidence. Thus, taking into consideration this narrow stream of literature, the current study undertakes the challenge to determine the workability of a model that includes project management maturity as an antecedent to organizational reputation.

Additionally, it has been observed from the sparse existing literature that organizations that have mature structures and processes are considered to have a better reputation [81]. Moreover, it is argued that managing the reputation of an organization is a difficult activity [82], specifically when it involves multiple stakeholders. This escalating complexity requires project management maturity in organizations that assures the efficient use of resources. Similarly, a number of projects are not completed within the defined schedule and estimated budget and do not provide the expected value to organizations because of immature project management practices [83]. Meanwhile, in a research report, PM Solutions claimed that there is a direct and strong correlation between

TABLE 2. Project management maturity & organizational reputation.

Project Management Variables	Relevance to Organizational Reputation	Proposed by
Project Management Maturity	Improved management systems and firm age have a positive association with the reputation of organizations.	- [14], [22], [60], [84]–[86]

the project management maturity of an organization and its overall performance [61].

Similarly, the concern of project management maturity has surfaced in organizations because the ideal way to change complex situations, such as reputation is through maturity in project management [59]. Table 2 shows the relevance of project management maturity with respect to organizational reputation. From the extant literature, there is significant evidence that the association of reputation with its antecedents varies from country to country [84]. Therefore, in this study, we seek to contribute to the literature by empirically examining the impact of project management maturity on organizational reputation in the context of public sector organizations in Pakistan.

Hence, it may be assumed that the concept of project management maturity in organizations, as suggested by the literature, is closely associated with the reputation of the organizations which will be investigated in this study. Based on the argument we propose:

H1: There is a positive relationship between project management maturity and organizational reputation.

Furthermore, H1 is divided into partial hypotheses based on project management maturity dimensions discussed earlier.

1) PROCESS MANAGEMENT

Process management was traditionally understood as the development, design and execution of organizational processes. However, in recent literature, it is proposed that process management is the management of the interaction between processes, analyzing and optimizing the processes [87]. In terms of projects, process management is the determination of processes that are vital for project completion and the standardization of project processes. Furthermore, it is debated in the existing literature that adequate management of processes on projects may lead to a favorable impact on the reputation of the organization [79]. Thus, it is inferred here:

H1a: There is a positive relationship between process management and organizational reputation.

2) CONTINUOUS IMPROVEMENT

Organizations should continuously develop their systems and processes to create value. Moreover, organizations that deal

specifically in projects should lay emphasis on striving for improvement in project structures. Furthermore, it is debated in the existing literature that organizations which continuously improve themselves add intangible value, such as reputation to their organizations [64]. Thus, based on the reasoning stated above it is suggested that:

H1b: There is a positive relationship between continuous improvement and organizational reputation.

3) PROJECT MANAGEMENT TRAINING

Another aspect of project management maturity in organizations that is exhaustively discussed in the literature is project management training. Training is defined as the development of the capabilities and skills of the workforce to achieve the strategic objectives of organizations [88]. Training in project management is considered to have a positive influence on the outcomes of a project [89]. Also, project management training creates and adds value to the organization performing projects [90]. Based on the arguments presented above it is proposed that:

H1c: There is a positive relationship between project management training and organizational reputation.

4) KNOWLEDGE MANAGEMENT AND TRANSFER

Knowledge Management & Transfer is the creation, utilisation and distribution of knowledge [75]. However, knowledge transfer is different from the mere exchange of information because it involves capturing, creating, disseminating knowledge and ensuring its organization-wide availability. Moreover, managing and transferring knowledge in an organization and on projects is an important element that leads to competitiveness and creates value [88]. The role of knowledge management and transfer is underestimated and needs attention. Thus, we suggest:

H1d: There is a positive relationship between knowledge management and transfer and organizational reputation.

5) PROJECT MANAGEMENT AWARENESS

Globally, organizations and academicians have started to familiarize themselves with project management because it is emerging as a core competency. Project management awareness is considered as the general cognizance of project management being critical for overall organizational success. Similarly, the inclusion of project management methodology in the organizational philosophy is a clear indication of organizational familiarity with project management [91]. Project management awareness among project stakeholders, including project team members, assists in attaining project and organizational objectives [92]. Hence, we propose:

H1e: There is a positive relationship between project management awareness and organizational reputation.

6) PROJECT MANAGEMENT SOFTWARE

Project management maturity in organizations can also be judged by the application of project management tools,

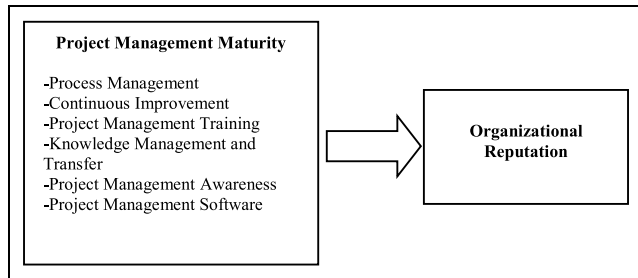


FIGURE 2. Proposed research model.

specifically the use of software. It is observed from the existing literature that organizations can be more efficient and enhance their performance by using project management software [66]. The use of software does not only guarantee successful project results, but it also helps in creating intangible value for the organizations, such as reputation. Therefore, it is hypothesised:

H1f: There is a positive relationship between project management software and organizational reputation.

The relationship between project management maturity, its dimensions and organizational reputation are schematically presented in Figure 2. It can be understood from the figure that project management maturity may play a role in the creation or enhancement of the reputation of organizations.

III. METHODOLOGY

Scientific progress depends on systematic research and the relevant methodology. The basic notion of research is to provide answers to questions and to generate new knowledge [93]. In this research, a positivist research paradigm is adopted to assess the relationship between project management maturity and organizational reputation. Positivism is referred to as a “scientific method” which is founded on the philosophy of empiricism and rationale [94].

Furthermore, in a positivist research paradigm, constructs are measured and evaluated quantitatively to predict a cause and effect relationship. In the following sections regarding the methodology employed in this study, questionnaire development with partial least squares structural equation modelling assessment techniques are discussed comprehensively.

A. QUESTIONNAIRE DEVELOPMENT

A questionnaire, also known as a research instrument, is the set of questions (questions can be either phrases, words, sentences, or even images) used to elicit information and expert opinion from respondents which are relevant to the nature of the study [95]. In this study, a research instrument was developed consisting of three different sections. In the first section, the demographics of the respondents were noted, such as qualifications, age, and experience. The purpose of including this section is to validate if the participant in the study possesses adequate knowledge and experience in the relevant field of inquiry.

The next section of the questionnaire intends to measure Project Management Maturity and its dimensions (Process Management, Continuous Improvement, Project Management Training, Knowledge Management & Transfer, Project Management Awareness and Project Management Software). This part of the instrument was adopted from Albrecht and Spang [79]. The third section of the questionnaire is used to measure the dependent variable, i.e. Organizational Reputation. This section comprises of fourteen different adjectives suggested by Chun and Davies [96]. A five-point “Likert Scale” is used to collect the responses ranging from 1 = strongly disagree to 5 = strongly agree. A sample of 20 random respondents was drawn from the population to determine if the questionnaire possessed correctness and clarity. As a result, a few modifications to the statements measuring project management maturity were made for better understandability. The responses from the pilot test were not included in the study.

B. SAMPLE AND DATA COLLECTION

In 1996 Marshall suggested a “key informant technique” to determine the sample for conducting a quantitative study [97]. According to this technique, middle-level managers should be preferred as respondents because they have the desired level of experience and knowledge. Simply stated, project managers, program managers or project directors are the most suitable respondents for this study because they have a sound understanding of project management maturity in their organizations.

Consequently, managers working in mid-level positions of organizations engaged in different projects for the Government of Pakistan are determined as the unit of analysis for this study. The details of the organizations sampled were obtained from the Pakistan Engineering Council. However, it was observed that 75,713 organizations were registered with this government body as of 2017. For the ease of access to target respondents, a non-probabilistic sampling method is adopted in this study. Moreover, two different techniques are used to calculate the sample size. The first technique employed to determine the sample size is that suggested by [98]. Based on their assumptions, a sample of 384 respondents is sufficient to represent the population. Whereas, the second technique to determine the sample size used the G*Power tool [99]. At a power of 95%, a statistical significance level of 5%, and an effect size of 15% the proposed sample size appeared to be 119 respondents. Hence, a sample size in between these two suggested ranges is considered sufficient to represent the population.

Data was collected from across Pakistan, i.e. four provinces (Balochistan, Khyber Pakhtunkhwa, Sindh and Punjab) and the capital (Islamabad) to gain maximum coverage. Moreover, this data was compiled from January 2017 until April 2017. Through e-mail, an online link for the instrument was forwarded to 1500 firms, from the database provided by the Pakistan Engineering Council. After a month, a soft reminder was given to the respondents to fill in the questionnaire.

TABLE 3. Demographic profile of the respondents.

		Frequency	Percent (%)
QUALIFICATION	Diploma	39	9.2
	Bachelors	242	56.9
	Masters	136	32.0
	PhD	8	1.9
			100.0
GEOGRAPHY	Khyber Pakhtunkhwa	91	21.4
	Balochistan	128	30.1
	Punjab	85	20.0
	Islamabad	60	14.1
	Sindh	61	14.4
			100.0
PROJECT EXPERIENCE	20 years plus	83	19.5
	16 to 20 years	25	5.9
	11 to 15 years	29	6.8
	6 to 10 years	91	21.4
	1 to 5 years	197	46.4
		100.0	
POSITION	Project Manager	253	59.5
	Project Director	27	6.4
	Portfolio Manager	23	5.4
	Program Manager	54	12.7
	Architect	13	3.1
	Team Member	51	12.0
	Others	4	0.9
			100.0

However, among the completed questionnaires, only 425 responses were considered usable. The sample size obtained was, however, greater than that determined necessary through the G*power and the Krejcie & Morgan technique.

The demographic profiles for the respondents who participated in this study are displayed in Table 3. Moreover, it is observed that the majority of the respondents either possess a Bachelor's or Master's degree. This indicates that the sampled respondents has sufficient knowledge of the matter under investigation. Similarly, from Table 3, it is noteworthy that the respondents are well scattered across Pakistan. Likewise, the majority of the participants in the survey were young project managers having less than 10 years of experience. However, almost 20% of the respondents had experience of more than 20 years in public sector projects. The responses were mainly given by project and program managers working in these organizations. Thus, from the demographics of the respondents, it is observed that a major chunk of the participants in the study possessed sufficient knowledge and experience in public sector projects.

C. ANALYZING THE DATA

Initially, researchers relied on univariate and bivariate techniques to analyze and understand data. However, it has become necessary to use more advanced multivariate techniques to analyze the relationships among multiple variables. Structural Equation Modelling (SEM) is one of the modern multivariate statistical methods that enable a researcher to compute the relationship among multiple variables concurrently. Furthermore, SEM has been divided into two subcategories i) Covariance Based – Structural Equation Modelling (CB-SEM) and ii) Partial Least Squares Structural Equation Modelling (PLS-SEM).

In this study, we employed PLS-SEM because this technique is considered to be more robust in the prediction of cause and effect relationships among variables. Also, PLS-SEM i) surpasses any data distributional assumptions (non-parametric), ii) can handle constructs with a single item, iii) easily incorporates formative and reflective constructs, iv) handles complex models with many structural model relationships and higher order constructs, v) minimises the amount of unexplained variance and vi) provides a high level of Power [100].

In PLS-SEM the data is evaluated in two separate parts, i.e. i) Measurement model analysis and ii) Structural model analysis [101]. Measurement model analysis enables the researcher to evaluate the relationship among the latent (unobservable) variables and their items. Whereas, the structural model analysis enables a researcher to understand and comprehend the relationship between the exogenous (independent) construct and the endogenous (dependent) construct. Furthermore, the structural model analysis facilitates the researcher in answering the proposed hypotheses.

IV. RESULTS

In this study, we have employed the two-stage approach suggested by Becker, Klein and Wetzels [101] to analyze the quantitative data. The measurement model is analysed for internal consistency, validity and collinearity in the first stage. A graphical display of the measurement model is provided in Figure 3 below.

A. MEASUREMENT MODEL ANALYSIS FOR LOWER ORDER REFLECTIVE CONSTRUCTS (1ST STAGE)

1) RELIABILITY

Primarily, the internal consistency (reliability) of the items in the instrument is analysed by using two different methods. Reliability is traditionally determined by observing the Cronbach Alpha (α) coefficient. For an instrument to be reliable, it is important that the alpha (α) coefficient should be greater than 0.6 [102]. It can be observed from Table 4 that the alpha values of all of the LOC's are more than 0.6, thus, exhibiting sufficient internal consistency.

Additionally, it has been suggested by Hair *et al.*, [100] that along with the Cronbach Alpha coefficient, it is also important to assess the Composite Reliability (CR) of the

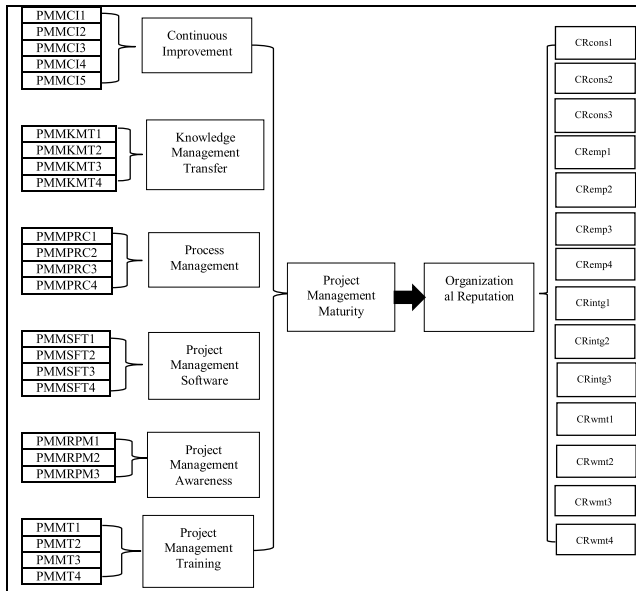


FIGURE 3. Measurement model.

TABLE 4. Results of the assessment of the measurement model for lower order constructs.

Construct	Items	Min. Factor Loading	AVE	CR	Cronbach's α
Process Management	4	≤ 0.656	0.596	0.854	0.771
Continuous Improvement	5	≤ 0.722	0.532	0.850	0.781
Project Management Training	4	≤ 0.715	0.579	0.846	0.756
Knowledge Management & Transfer	4	≤ 0.730	0.578	0.845	0.756
Project Management Awareness	3	≤ 0.805	0.681	0.865	0.765
Project Management Software	4	≤ 0.796	0.701	0.903	0.857
Organizational Reputation	14	≤ 0.560	0.517	0.937	0.927

instrument. The CR determines the reliability of the individual indicators contributing to a latent construct. The threshold value determined by Hair *et al.*, [100] for the CR is 0.7 and above. In this study, the CR values of the latent variables are well beyond the recommended threshold. This indicates that the instrument is reliable for further analysis. The CR values for the latent variables are presented in Table 4.

2) CONVERGENT VALIDITY

After having confirmed the reliability of the questionnaire, the instrument is tested for validity. Validity refers to the degree of accuracy in measuring what we intend to measure [95]. In PLS-SEM, both the convergent and discriminant validity of an instrument is evaluated [100]. Convergent

TABLE 5. Discriminant validity of the lower order constructs.

	1	2	3	4	5	6	7
Continuous Improvement (1)	0.730						
Reputation (2)	0.538	0.719					
Knowledge Management Transfer (3)	0.596	0.582	0.760				
Process Management (4)	0.570	0.513	0.525	0.772			
Project Management Awareness (5)	0.501	0.488	0.542	0.540	0.825		
Software (6)	0.504	0.495	0.558	0.422	0.546	0.837	
Training (7)	0.499	0.502	0.571	0.462	0.537	0.631	0.761

validity is the magnitude of the indicator in correlation with its alternate measures. Convergent validity is determined by assessing the factor loadings and the Average Variance Extracted (AVE). Factor loadings greater than 0.7 indicate that the indicators have too much in common. Whereas, indicator loadings between the range of 0.4 to 0.7 are also adequate if the AVE of the construct is beyond the threshold. The minimum factor loadings of the constructs in this study are displayed in Table 4. It can be noted that the minimum factor loadings for all of the constructs are in the acceptable range.

Similarly, the aggregate variance accounted for by the indicators towards the latent construct is known as the Average Variance Extracted (AVE). The threshold determined by Hair *et al.*, [100] for the AVE is 0.5 and above. The values for the AVE are given in Table 4 and it can be observed that they are well beyond the threshold. Thus, it can be stated here that the instrument satisfies the criterion of convergent validity.

3) DISCRIMINANT VALIDITY

Having confirmed the convergent validity, we will now assess the discriminant validity of the constructs. Discriminant validity is understood as the degree to which one variable is empirically different from the others [103]. In this study, we assess the discriminant validity using the Fornell-Larcker criteria [104]. According to them, for a construct to be discriminately valid, the square root of the Average Variance Extracted (AVE) of a construct should be greater than its correlation (r) with other constructs ($\sqrt{AVE} > r$).

The square root of the AVE for the lower order constructs in this study are displayed diagonally in bold figures in Table 5. Whereas, the correlation between the constructs is displayed in plain figures in Table 5. It is observed that all of the lower order constructs satisfy the criterion of discriminant validity. Thus, it is stated here that the constructs used in this research are empirically distinct from each other.

TABLE 6. Collinearity among the indicators of project management maturity.

Higher Order Formative Construct	First Order Construct	Multicollinearity (VIF)
Project Management Maturity	Continuous Improvement	1.904
	Knowledge Management Transfer	2.024
	Process Management	1.763
	Project Management Awareness	1.854
	Project Management Software	1.983
	Project Management Training	1.990

B. MEASUREMENT MODEL ANALYSIS FOR THE HIGHER ORDER FORMATIVE CONSTRUCT (2ND STAGE)

In the second stage of the measurement model analysis, the latent variable scores obtained from the previous stage are used to develop the higher order construct. As discussed earlier in the present study, project management maturity is modelled as a higher order formative construct.

1) ASSESSMENT OF COLLINEARITY

Collinearity can prove to be problematic for formative constructs. Collinearity is understood as the exaggerated correlation among the items of a formative construct [100]. In the case of collinearity, a researcher must remove the redundant indicators having a high level of correlation. The Variance Inflation Factor (VIF) is used to determine collinearity among the items of a construct and it is reciprocal to Tolerance. Reporting the VIF values for collinearity has become the standard practice. In PLS-SEM, a VIF value of 5 and above suggests a potential collinearity threat [105].

Whereas, in our study, the VIF values for all the indicators of project management maturity are well below the threshold. Therefore, it can be stated that there are no collinearity issues among the dimensions of project management maturity.

2) ASSESSMENT OF FACTOR LOADINGS AND OUTER WEIGHTS OF THE DIMENSIONS OF PROJECT MANAGEMENT MATURITY

Assessing the relevance of the outer weights of a formative construct is an important requirement of measurement model analysis [100]. In PLS-SEM the construct is formed by the formative indicators and it is understood by the standardized scores of the outer weights given by SMART PLS. These scores indicate the items relative importance and contribution towards the construct. The scores for the outer weights of indicators of project management maturity are given in Table 7. Additionally, it is recommended that these outer weights should be checked for their significance. The significance values for the outer weights are retrieved through the bootstrapping technique.

However, it is noted from the results of bootstrapping that the outer weights of only one indicator (project management

TABLE 7. Significance of the outer weights and loadings of the indicators of project management maturity.

(Higher Order Construct)	Lower Order Construct (Dimensions)	Outer Weight	Significance of the Weights (p-value)	Factor Loading
Project Management Maturity	Continuous Improvement	0.235	0.009	0.801
	Knowledge Management Transfer	0.365	0.000	0.867
	Process Management	0.241	0.001	0.764
	Project Management Awareness	0.116	0.087	0.727
	Software	0.154	0.029	0.737
	Training	0.152	0.043	0.748

TABLE 8. Collinearity statistic (VIF) for the structural model.

Variables	Organizational Reputation
Project Management Maturity	1.000
Continuous Improvement	1.904
Knowledge Management and Transfer	2.024
Project Management Awareness	1.854
Software	1.983
Training	1.990
Process Management	1.763

awareness) are not significant, i.e. p-value > 0.05. In general, such indicators should be considered for removal. But, if they cause content validity issues, they should be retained only if their outer loadings > 0.5 [100]. It is observed from Table 7 that the indicator (project management awareness) has a factor loading of 0.727 and the values for outer weights are usually lower than those of factor loadings. Therefore, project management awareness is retained and considered as relatively important, but not absolutely important, in this study.

C. ASSESSMENT OF THE STRUCTURAL MODEL

In the second part, the structural model is evaluated to answer the proposed hypotheses in the study. In PLS-SEM a structural model is assessed in four steps. Initially, the multicollinearity among the exogenous and endogenous constructs is evaluated. The variance inflation factor (VIF) values are listed in Table 8. It can be observed that the collinearity statistic (VIF) values are well below the threshold value of ‘5’ indicating that there are no multicollinearity issues in the structural model.

In the second part of the structural model analysis, the path coefficients, i.e. beta (β) values of the different relationships in the research model are analysed. Furthermore, these β

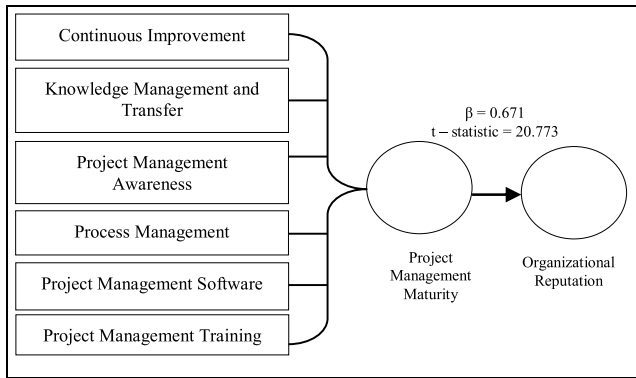


FIGURE 4. Structural model exhibiting the relationship between project management maturity and organizational reputation.

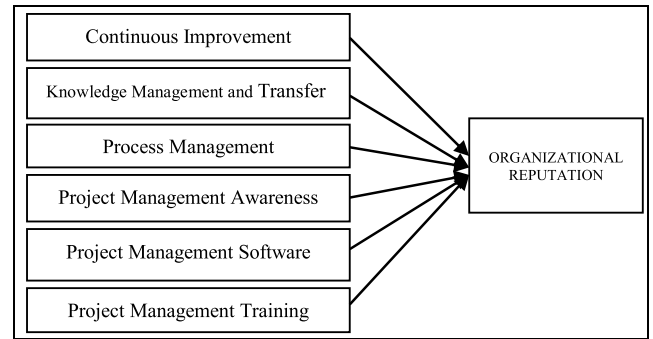


FIGURE 5. Structural model exhibiting the relationship between the dimensions of project management maturity and organizational reputation.

TABLE 9. Summary of the structural model.

	Hypothesis	β	p-Value	T Statistic	Decision
1	Project Management Maturity \rightarrow Organizational Reputation	0.671	0.000	20.773	Supported
1a	Process Management \rightarrow Organizational Reputation	0.162	0.001	3.247	Supported
1b	Continuous Improvement \rightarrow Organizational Reputation	0.158	0.008	2.669	Supported
1c	Project Training \rightarrow Organizational Reputation	0.102	0.043	2.026	Supported
1d	Knowledge Management Transfer \rightarrow Organizational Reputation	0.245	0.000	4.271	Supported
1e	Project Management Awareness \rightarrow Organizational Reputation	0.078	0.088	1.708	Not Supported
1f	Project Software \rightarrow Organizational Reputation	0.103	0.034	2.122	Supported

- values are evaluated to answer the hypotheses proposed earlier. The major objective of the study is to determine the significance of the relationship between project management maturity and organizational reputation. Project management maturity in this study is modelled as a higher order formative construct having six different dimensions.

This can be observed from the structural model presented in Figure 4, presented below. The significance of the β - value and the t - statistic is retrieved after bootstrapping in PLS-SEM. However, it is noted from Table 9 that the relationship between project management maturity and

organizational reputation is significant as $\alpha = 0.05$. The β - value is 0.671 and the t - statistic is 20.773 indicating that for every one standard deviation increase in project management maturity the probability of improving the reputations of organizations are 67.1%.

Similarly, in this study, the effect of the dimensions of project management maturity is also individually estimated. The structural model for the relationships is presented in Figure 5.

However, the results for the β - values, p - values and the t - statistic are provided in Table 9. It can be observed that except for project management awareness, all the other dimensions of project management maturity have a significant impact on the reputation of public sector organizations. The β - values and their p - values which are given in Table 9 are retrieved from performing the bootstrapping of the structural model. In total, out of seven proposed hypotheses in this study, six relationships are supported, and one is not supported by the data. The summary of the results of the structural model is presented in Table 9.

In the third stage of the structural model analysis, the R - square (Coefficient of determination) is evaluated to understand the total amount of variance explained by the constructs. Project management maturity alone explains 44.4% of the variance in organizational reputation. Whereas, the dimensions of project management maturity explain 45.5% of the variance in organizational reputation.

After having determined the coefficients of determination, the structural model is analysed for F - square (effect size) of the dimensions of project management maturity on the overall model. It is determined from the results that continuous improvement (F - square = 0.026), knowledge management and transfer (F - square = 0.055) and process management (F - square = 0.03) have a small to medium effect on the model. Whereas, project training and project software have a small effect on the overall model. Thus, it can be understood that among the dimensions of project management maturity, knowledge management and transfer is the most important in determining the reputation of public sector organizations.

V. DISCUSSION

Initially, in this research, project management maturity was tested on its relationship with organizational reputation. However, it was determined that project management maturity was significantly associated with organizational reputation, where 44.4% of the variation in organizational reputation was explained by project management maturity. Where a β - value of 0.671 ($p < 0.001$) unit increase in project management maturity correlates with an improvement in the reputation of an organization. The results of this study are in coherence with the prior findings of De Souza and Gomez [59]. They determined that if organizations have mature project management practices in place, it may result in several benefits including an improved reputation. The findings also support the evidence presented by Ali *et al.*, [84] who argue that the antecedents to reputation may vary from country to country, whereas in this study it has been statistically proven that, in the context of Pakistan, project management maturity has a significant impact on the reputation of public sector organizations.

Furthermore, the present study provides sufficient quantitative evidence that among six of the dimensions of project management maturity specified by Albrecht and Spang [79] continuous improvement ($\beta = 0.158$, $p < 0.01$), knowledge management and transfer ($\beta = 0.245$, $p < 0.01$), process management ($\beta = 0.162$, $p < 0.01$), project management training ($\beta = 0.102$, $p < 0.05$) and the use of project management software ($\beta = 0.103$, $p < 0.05$) have a significant impact on the reputation of public sector organizations. The findings are in parallel with the reasoning's presented in previous studies [64], [66], [79], [88], [90], [106]. Moreover, it is noted that among the significant factors; knowledge management and transfer and continuous improvement in public sector organizations are vital for reputation creation.

However, project management awareness did not exhibit a significant statistical impact on organizational reputation. This may be due to the fact that the respondents in public sector organizations in Pakistan are sceptical about project management awareness as a cause for the creation or improvement of reputation. In summary, the proposed research model exhibited sufficient statistical evidence about the relationship between project management maturity, its dimensions and organizational reputation.

VI. CONCLUSION

Reviving reputational integrity for public sector organizations is crucial, especially in developing countries, such as Pakistan, where most organizations are facing a reputation crisis. In this study, the author has provided empirical evidence that proves the relationship between project management maturity and organizational reputation. Moreover, this study demonstrates how maturity in project management contributes to the value creation process for public sector organizations.

However, there are several factors that determine whether an organization is mature in project management practices. The most common ones are process management, continuous

improvement, project management training, knowledge management transfer, project management awareness and the use of project management software. One of the objectives of the present study was to determine if these factors also have an impact on the reputation of public sector organizations in Pakistan.

Subsequently, the findings of the research suggest that public sector organizations in Pakistan can gain reputational capital if they have standardized and consistent project processes. Furthermore, the results of this study indicate that continuous improvement and investment in project management training can have a favorable impact on the identity and image of organizations. Knowledge dissemination across the projects and the use of software are also determined to add value to organizations. Thus, if public sector organizations in Pakistan wish to mend their reputation, attract foreign direct investment, and sustain during economically turbulent times, they should focus on implementing project management maturity models.

VII. LIMITATIONS AND FUTURE RESEARCH AVENUES

In this study, the data was collected from public sector project managers in Pakistan, therefore, the results of the study cannot be generalised. However, in future, researchers could conduct similar studies in different research settings to determine if project management maturity effects organizational reputation. Similarly, in the present study, project management maturity is evaluated using a combination of the traditional and modern PMMM's, whereas, in future researchers can use other PMMM's to measure organizational project management maturity. This study assessed project management maturity as an antecedent to organizational reputation, and it paved a way for future research on bridging project management and reputation.

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