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The Impact of Implementing Project Management Knowledge Areas on Public Project Quality in Palestine

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الملخص:

هدف هذا البحث إلى معرفة تأثير مجالات المعرفة الخاصة بإدارة المشاريع على جودة المشاريع العامة في فلسطين، وتحديداً مشاريع البنية التحتية التي تنفذها وتديرها وزارة الأشغال العامة والإسكان.

استخدم الباحثان المنهج الوصفي والتحليلي وتم استخدام برنامج التحليل الإحصائي المتقدم Smart-PLS3 لتحليل نماذج البحث (الهيكلية والقياس)، وتم جمع البيانات باستخدام استبيان وزع على 113 مقاولًا وموظفا من وزارة الأشغال العامة والإسكان.

خلصت الدراسة إلى أن المجالات المعرفية لإدارة المشروع ، وهي (التكلفة، الاتصالات، الموارد، المشتريات) لها تأثير إيجابي قوي على جودة المشاريع العامة في فلسطين، حيث كان لإدارة اتصالات المشروع التأثير الأكبر، تليها إدارة موارد المشروع. وكان لإدارة التكلفة وإدارة مشتريات المشروع أقل تأثيراً.

أوصى البحث بضرورة إنشاء هيئة عليا في الحكومة الفلسطينية تكون مسؤولة عن ضمان جودة المشاريع العامة ومراقبة الجودة، ويجب اعتماد مجالات معرفة إدارة المشاريع المعروفة في جميع المشاريع العامة.

كلمات مفتاحية: إدارة المشاريع, مجالات المعرفة، نوعية المشروع، وزارة الاشغال والاسكان.

Abstract:

This research aims to investigate the impact of implementing Project Management Knowledge Area's on the quality of public projects in Palestine, specifically infrastructure projects executed and managed by the Ministry of Public Works and Housing.

The researchers used a descriptive and analytical approach; the advanced statistical analysis program Smart-PLS3 was used to analyze the research models (Structural and measurement), data was collected using a questionnaire distributed to 113 employees and contractors working in or with the Ministry of Public Works and Housing.

The study concluded that Project Management Knowledge Areas, namely (Cost, Communications, Resource, and Procurement) have a strong positive impact on public project quality in Palestine, where Project communications Management had the highest impact, followed by Project Resource Management, followed by Project Cost Management, and Project Procurement Management had the lowest impact.

The research recommended that a higher commission in the Palestinian government in charge of public project quality assurance and quality control should be established, the well known Project Management Knowledge areas should be adopted in all public projects, and the project management and project teams should have more exposure to international standard practices in the public project sector.

Keywords: Project Management, knowledge Areas, Project Quality, Ministry of Public Works and Housing (MPWH).

i. Introduction

The Palestinian state being a fairly young, disadvantaged country faces significant difficulties accomplishing its strategic objectives and plans because of its restricted assets, and Israeli constraints (PNA, 2011), the most important difficulty is the execution of publicly managed projects, which are essential in building a solid and organized state (Janem, 2011).

Considering the exceptional conditions wherein public projects are executed in Palestine (shortage of assets, absence of large-project supervision proficiency and the obstructions caused by the Israeli-Palestinian conflict), it's critical to implement Project Management (PM) strategies that guarantee project quality, productivity and maintainability.

PM is defined by (Kerzner, 2017) as "The planning, organizing, directing, and controlling of company resources for a relatively short-term endeavor that has been established to complete specific goals and objectives", this brief goal describes a project which is defined as a "Temporary endeavor undertaken to create a unique product, service, or result" (PMBOK, 2017).

Project management knowledge areas (PMKA's) are "Fields or areas of specialization that are commonly employed when managing projects, a knowledge area is a set of processes associated with a particular topic in project management" (PMBOK, 2017), the significance of these areas vary according to the type of project, and are essential to understand, manage and execute all through the project's life (Gasik, 2016).

The agreed upon PMKA's are, Implementation Management, Scope Management, Time Management, Cost Management, Quality Management, Resource Management, Communications Management, Risk Management, Procurement Management, and Stakeholder Management (Hayajneh, Hamada & Aljawarneh, 2020, p. 454).

In Palestine the official government ministry in charge of executing and managing public projects is the Ministry of Public Works and Housing (MPWH), this ministry is responsible for all kinds of government projects including, open road works, open use structures, and public housing projects (MPWH, 2019).

As mentioned earlier, Palestinian public projects are confronted with a considerable amount of threats, to conquer those threats, the implementation of new and advanced methods and strategies in project management becomes of special importance.

This study is one of the few researches that explore the usage of PMKA's in Palestine. It is also the first to contemplate their impact on the quality of public projects in Palestine in an effort to improve quality, efficiency and productivity in public projects in Palestine. The researcher in this study considered the public project sector in Palestine and the impact that PMKA's has on them. He also identified which of the PMKA's is executed and to what degree.

ii. Statement of the Problem

Due to the importance of public projects and the level of scrutiny they face by the public sector (Wirick, 2009), and the challenges that face Palestinian public projects specifically (scarcity of funds, Israeli occupation, lack of resources and prolonged project lifecycles, etc), and the continuous technical and managerial problems that they face (Mahamid, 2013b), the need for better project management techniques and skills is needed, an important indicator for efficiency in project management is the PMKA's (PMBOK, 2017).

Quality is the degree to which a project deliverable fulfills requirements. So quality can only be achieved if all the stated requirements defined in the project scope statement are met, and all planned processes are achieved in an organized and timely manner, in this study the quality of a project will be evaluated according to efficiency and effectiveness of the implemented project management knowledge areas, the Study problem can be summed up by this main question:

"What is the impact of implementing Project Management Knowledge Areas on public project quality in Palestine?"

Several secondary questions rise from the main question:

1. Which PMKA's does the MPWH implement in managing public projects?
2. How do the implemented knowledge areas impact pubic project quality?
3. How can the MPWH improve public project quality in Palestine?

iii. Research Objectives

This study aims to investigate the impact of implementing PMKA's on public project quality in Palestine, specifically infrastructure projects executed and managed by the MPWH.

Furthermore the study has a number of sub-objectives which are:

1. To identify the project management knowledge areas implemented in public projects in Palestine.
2. To identify the level of public project quality in Palestine.
3. To provide recommendations to enhance the quality of MPWH project management practices.

iv. Importance and Originality

Researching the impact of the application of PMKA's on public project quality especially in underdeveloped countries is of special importance, due to the fact that resources available for public projects are limited and must be well managed to ensure an optimal outcome and efficient use (Mahamid, 2013b).

The MPWH in Palestine faces many challenges that dictate the implementation of the state-of-the-art techniques to improve its performance on public projects. There are very few studies that addresses this issue; therefore, this study is expected to be a valuable tool that officials can use to improve performance in the execution of public projects, and will help those officials in the decision making process regarding project execution.

THEREFORE, THE OUTCOME OF THIS STUDY AND THE APPLICATION OF ITS RESULTS ARE EXPECTED TO HAVE A POSITIVE IMPACT REGARDING THE EFFICIENT USE OF THE LIMITED RESOURCES AVAILABLE TO THE MPWH AND IMPROVE PUBLIC PROJECT QUALITY.

v. Theoretical Framework and Literature review

Project Definition

A project is an "Undertaking to achieve a goal, or to create a new product or to provide a particular result or service, within a specified period that has a clear beginning and target end or completion date" (Hermano & Martín-Cruz, 2019).

Where the PMBOK (2017), defined it as "A temporary endeavor undertaken to create a unique product, service, or result", (Meredith, Mantel Jr, & Shafer, 2017) define projects as "endeavors that have a definite life cycle, defined scope, importance, and that are unique'.

It is clear that all the definitions agree as does the researcher's that a project is a pre-defined scope of activities that has a clear start and end date with a clear budget, the project start date could be as early as the date of inception and the completion should be the date when the goal or target is achieved, a project is considered a temporary effort

having a start and a finish (Gasik, 2015), and it's also characterized by its uniqueness of the planned outcome, resulting from the successful execution of the project (Izmailov, Korneva, & Kozhemiakin, 2016).

Project management

Project Management (PM) is defined as per the (PMBOK, 2017) as "The application of knowledge, skills, tools, and techniques to project activities to meet the project objectives", PM can be implemented effectively and efficiently by the application of project management processes throughout the project (Spalek, 2014).

Effective PM enables groups, individuals, private and public organizations to meet their goals, stakeholder needs, improve chances of success, find viable solutions for problems and issues, timely response to risks, efficient use of resources, identify failing projects and attempt to recover or terminate them, improve management of constraints and balance their influence on the project (Badewi, 2016).

However, poor PM will result in, missing deadlines, overruns in costs, low quality, repeated work, unnecessary project expansion, the negative impact on the organization reputation, stakeholders needs not met, and failure to achieve the goals of the project (Kerzner, 2017).

Project Management Knowledge Areas (PMKA's)

The PM processes can also be classified by Knowledge Areas, a Knowledge Area is defined as "A clear area of project management defined by its knowledge requirements and set according to project practices, outcomes, techniques, processes and tools" (PMBOK, 2017).

Project management knowledge areas are defined in many frameworks and knowledge bodies that support project management, like, (IPMA, 2016; Lock & Wagner, 2016; PMI, 2017)but the (PMBOK, 2017) illustrates and defines these areas the clearest.

It is important to note that, in spite of the PMKA's being interrelated, they are independently defined, the Four Knowledge Areas that are included in this research are: project cost management, project resource management, project procurement management, project communications management.

Project Cost Management

Project Cost Management (PCM) usually includes the deferent processes used to plan, estimate, finance, budget, manage, and control costs of the project to achieve completion within the budget (Tonchia, 2018).

In some small projects, cost estimate and budget can be viewed as a single process which can be performed by one person within a short period of time (Kerzner, 2017). In this research these two processes were defined as separate processes due to the deference in the tools and techniques of each of them (Idan & Dheyab, 2019).

Project Resource Management

Resources are the main requirement to successfully execute a project, and to ensure this success those resources should be used efficiently and effectively, therefore, an essential part of project execution is the coordination and management of resources of all kinds (Human, physical, equipment, facilities, and infrastructure…etc) (Pinha & Ahluwalia, 2019).

Project Resource Management (PRM) includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project (Svensson & Dollerup, 2020). An important part of the project resource planning process is to assign roles and responsibilities to each project team member and those roles and responsibilities are defined and monitored throughout the duration of the project, the roles of the project team identified in the resource plan need to be filled with competent and qualified personnel (Shariatmadari, Nahavandi, Zegordi, & Sobhiyah, 2017).

Project Procurement Management

Project Procurement Management (PPM) consists of the needed processes to buy or obtain services, products, or results from outside sources. PPM involves the required control and management processes for the preparation and administration of contracts, contract addendums, memoranda of agreements (MOAs), purchase orders, or internal service level agreements (SLAs) (de Araújo, Alencar, & de Miranda Mota, 2017).

Usually the people who are responsible and authorized to procure goods and services are selected from the purchasing department staff members or project management team, PPM can also includes contract responsibility where the project management in charge of the project will deal directly with the service provider (Rane, Narvel, & Bhandarkar, 2019).

PPM includes a number of processes including; planning, where decisions for acquiring or purchasing a certain product or service and how to go about doing that are made, then, the team in charge prepare the contract documents, which includes requests for proposal sent to a number of providers, the feedback or quotations from the contacted providers or sellers are collected and analyzed by the procurement team, and the contract is awarded for the best submitted offer, then, the contract agreement is signed between the concerned parties (Morozov, Kalnichenko, & Liubyma, 2016).

Project Communications Management

Project Communications Management (CM) is extremely vital in the running and execution of a project, a clear communication protocol must be adopted during the projects life-cycle and all parties involved must strictly adhere to this protocol, lack of communications may result in misinformation and may delay the decision making process, which can cause delay in project execution or affect its final outcome (Saleh, 2012).

It's important for the project manager to make sure that the communications protocol is strictly followed, and all involved and interested parties are informed of the project status at all times, good communication is essential for meeting the stakeholders requirements and goals, and for solving the projects problems in a timely and effective manner (Galvis-Ardila, Anduquia, & Diez-Silva, 2020).

Project Quality

Quality is defined by Juran & Godfrey (1999, p. 26) as "Features of products or services which meet customer needs and thereby provide customer satisfaction". The Project Management Institute defines quality as "the degree to which a set of inherent characteristics fulfills requirements" (PMI, 2017, p. 44).

According to the Project Management Body of Knowledge (PMBOK, 2017, p. 273), Project Quality includes the processes and activities that determine quality policies, objectives and responsibilities so that the project will satisfy the needs for which it was undertaken.

The researcher finds that according to the various definitions of Project quality it mainly refers to the degree or extent that the deferent project requirements are fulfilled or satisfied. The final result intended by any project can be described in terms of quality parameters, depending on the degree of fulfillment of the project requirements, and on the weight of each component of the project (Pheng, 2018).

Finishing the project on time within the set budget does not matter if the end result is of poor quality, that's why it's important to make a quality management plan before the execution of the project starts, and this plan should be implemented at all stages of the project execution (Nguyen et al., 2018).

The steps taken during the project execution to inspect, test, and monitor the quality is called quality assurance (QA), which is usually composed of detailed procedures to inspect evaluate and monitor quality, and to suggest and implement corrective measures and remedies to maintain and improve project quality (Javed & Liu, 2017).

The project quality plan should state clearly and in detail the project requirements, and it should be designed and structured so that it keeps close monitoring and control on

the qualities of the processes to ensure the fulfillment of the specifications of the project (Shaikh & Darade, 2016).

vi. Literature review

The study of **(Abdulla, Alhashimi, & Hamdan, 2019)** evaluated the effect of Project Management Methodologies (PMMs) on project success in the oil and gas industry in the Kingdom of Bahrain. It also investigated the diverse project strategies utilized alongside their qualities and shortcomings. Mixed research methods were used to accomplish the goals of the study, it uncovered that project success is critically affected by the applied comprehensive PMMs, while supplemented PMMs have an insignificant effect on project success. This study suggested that the companies in the oil and gas industry in Bahrain have to focus more on project management methodologies and improve on them to achieve higher project success.

(Abuazoom, Hanafi, & Ahmad, 2019) studied the impact of human resource management (HRM) practices have on project quality in the construction industry of Libya, the quantitative research method was used in this study, the study found that the key HRM practices significantly influence project quality performance, and it suggests that it's important to implement HRM practices to ensure project quality and the success of the organisation.

(Ghamidi, 2019) aimed to identify the importance of knowledge management and its relationship to project management by recognizing its impact on the operations integration and the project success, the study concluded that it is crucial to implement knowledge management processes in managing projects, and to improve project quality, the main recommendation was to implement knowledge-based PM, and adopt its operations throughout the project life by holding training workshops to exchange knowledge, and to teach managers and staff about effective KM methods, that can be performed in Projects.

(Dahleez, 2017) investigated the application of PMKA's by Non-government organizations in Gaza Strip and he studied to what extent the implementation impacted project quality, the researcher used a questionnaire to collect the required data, the result of the research has shown that the knowledge areas that have a clear impact on project quality are as follows: Project integration, Project risk, Project procurement, Project human resources, in light of these results the researcher suggested some steps to be taken to improve performance in order to meet the acceptable world standard, the researcher has also suggested that more attention should be made to the time and risk parameters.

vii. Research Methodology

Research Design

The present research used the descriptive analytical approach which is a scientific analysis and interpretation method used to achieve a specific objective to explain a certain social, humanitarian or other phenomena (Al-Hamlan & Baniabdelrahman, 2015), for collecting data and then analyzing that data, using a questionnaire as the main tool for collecting the data of the research, a questionnaire was developed to research the impact of PMKA's on public project quality; two stages of analysis were conducted. Stage one a preliminary analysis to determine which of the ten knowledge areas in project management is implemented in Palestine and to what degree.

viii. Research Population and Sample

The population of this research was the heads of "MPWH" general administrations (Buildings, Roads, Technical follow-up, and Supervision), the planning department & project managers, contractors, consultants working with the ministry, which was according to the MPWH (73) employees working in different departments, and a total of (46) consulting and contracting firms.

The whole population was taken as a sample of (119) personnel, questionnaires were sent via Google forums to all sample members, (116) questionnaires were retrieved and (3) were excluded bringing the final total questionnaires to (113).

Statistical Analysis

Reliability

Cronbach's Alpha Method, is used to measure the reliability of the questionnaire (Easterby-Smith, Thorpe, & Lowe, 2002; George, 2003). The researcher calculated the reliability, as shown in table (1).

Table (1): Cronbach's Coefficient Alpha for the entire questionnaire

Factor	Number of items	Cronbach's Alpha value
Project cost management	5	0.762
Project resource management	6	0.767
Project communication management	5	0.796
Project procurement management	5	0.894
Project quality	10	0.802
Total degree	**31**	**0.817**

Source: Researchers Analysis

Participant Profile

The following table shows the descriptive analysis of the research sample:

Table (2) Sample Distribution According to Each Demographic Variable.

Variable	Variable level	Number	Percentage
Sex	Male	101	89.40%
	Female	12	10.60%
	Total	113	100
Age	less than 30 years	10	8.85%
	between 30-45 years	38	33.60%
	more than 45 years	65	57.50%
	Total	113	100
Experience	less than 5 years	0	0%
	between 5-15 years	45	39.80%
	more than 15 years	68	60.20%
	Total	113	100
Education	bachelors	83	73.50%
	masters	30	26.50%
	PHD	0	0%
	Total	113	100
Number of projects	less than 5 projects	0	0%
	5-10 projects	71	62.80%
	more than 10 projects	42	37.20%
	Total	113	100

Source: Researchers Analysis

A descriptive frequency analysis of the demographic data for the research sample shown in Table (4.1) showed that with regard to gender (sex), males form (n=101, 89.4%), and females form (n=12, 10.6%) of the research sample, this significant difference between male and female employees can be attributed to the fact that the construction industry is male dominated.

And with regard to age the first group was more than 45 years old (n=65, 57.5%) which is important due to the experience needed for project management, and none of the sample individuals had less than 5 years experience. And with regard to education (n= 83, 73.5%) hold a bachelors degree, and (n=30, 26.5%) hold a masters degree, with no individual holding a PHD, because most PHD holders take on a teaching job rather than a government position.

And with regard to number of projects the first worked on 5-10 projects (n=71, 62.8%), the second worked on more than 10 projects (n=42, 37.2%), and none worked on less than 5 projects.

Table (3) Values for the SEM adjustment quality after the elimination of the OVs with lower values for the factorial loads

Constructs	AVE	CR	rho-A
Project quality	**0.508**	**0.859**	**0.827**
Project cost management	**0.582**	**0.846**	**0.809**
Project resource management	**0.573**	**0.841**	**0.847**
project procurement management	**0.765**	**0.928**	**0.912**
project communication management	**0.563**	**0.860**	**0.899**

Source: Researchers analysis

From table (3), we found that the variables used in this research are reliable and had an Average Variance Extracted (AVE) value of more than (0.5) which is in the acceptable range, and Cronbach's Alpha and Composite Reliability values larger than (0.7). All values of the variables are in the acceptable range to conclude good reliability.

Discriminant Validity

Table (4) Correlations and measures of validity among variables

	AVE	PQ	PCM	PRM	PPM	CM
Project Quality	**0.508**	**0.712**				
Project cost management	**0.582**	0.449	**0.763**			
Project resource management	**0.573**	0.781	0.372	**0.786**		
project procurement management	**0.765**	0.698	0.256	0.443	**0.875**	

project communication management	**0.796**	0.663	0.585	0.528	0.476	**0.797**

Source: Researchers analysis

Table (4) suggests the AVE and cross component loading extracted for all latent variables. All the objects have a better loading on their corresponding construct than the move loadings on the other constructs in the model. The AVE for every component exceeded the respective squared correlation among elements, giving proof of discriminant validity (Fornell & Larcker, 1981).

Structural Model Assessment

After accepting the results of the convergent validity of the measurement model, we evaluate the results of the structural model. This involves studying the predictive capabilities of the model and the relationships between research variables. A set of criteria has been tested and should be used to evaluate the structural model. The basic criteria for testing the structural model include:

A. Coefficient of determination (R^2)

The coefficient of determination is the most popular indicator for evaluating the structural model, this indicator tests the predictive strength of the model, the researcher found that R^2 for the structural model for this research was 79.9%, which means that 79.9% Project Quality variable was explained by the independent variables (cost, communication, resource, and procurement management), and that is considered of high explanatory value.

B. Effect size f^2

Effect size shows how every independent variable affects the dependent variable on its own, from table (5) we notice that project cost management has a high effect on project quality on its own with a 47.8% value, and Project resource management has a high effect on project quality with a value of 80.3%, and project procurement management has a high effect as well on project quality with a 49.9% value, while project communication management has a low effect on project quality with a 8.9% value.

Table (5) Effect size f^2

	value	Result
PCM	**0.478**	**high**
PRM	**0.803**	**high**
PPM	**0.499**	**high**
CM	**0.089**	**low**

Source: Researchers analysis

C. Predictive Relevance Q^2

While the R square values denote predictive accuracy the Predictive Relevance Q^2 "Indicates the model's predictive relevance which is called 'Stone-Geisser's Q^2 value'" (Hair Jr, Hult, Ringle, & Sarstedt, 2016). The Q^2 values that greater than zero for a certain reflective endogenous variable indicate the path model's predictive relevance for the construct (Hair, Ringle, & Sarstedt, 2013).

Running the blindfolding procedure with omission Distance (D) value =7, we got the Q2 values greater than zero as shown in Table (6) which indicate our path model's predictive relevance is high.

Table (6) Predictive Relevance Q^2(Construct Cross validated Redundancy)

Total	SSO	SSE	Q^2 (=1-SSE/SSO)
Project Quality	678.000	421.510	0.778
Project cost management	452.000	452.000	0.318
Project resource management	452.000	452.000	0.315
project procurement management	452.000	452.000	0.603
project communication management	565.000	565.000	0.391

Source: Researchers analysis

D. Goodness of Fit of the Model (GoF)

The purpose of GoF is to account on the research model at both levels, namely measurement and structural model with focus on the overall performance of the model (Esposito Vinzi, Chin, Henseler, & Wang, 2010; Hair Jr et al., 2016), The calculation formula of GoF is as follow:

The criteria of GoF to determine whether GoF values are large, small, medium, or no fit to be consider as global valid PLS model were given by (Henseler & Sarstedt, 2013).

$$GOF = \sqrt{\overline{R}^2 \text{ x } \overline{(AVE)}}$$

$$GOF = \sqrt{0.799 \times 0.508}$$

$$GOF = \sqrt{0.406}$$

GOF= 0.637

The value of the Gof is (0.637), it can be said that the GoF of the model is large enough to be considered a sufficient global PLS model validity.

ix. Hypothesis Testing

Main Hypothesis:

H1: The application of PMKA's (procurement, cost, communications, and HR,) has a positive impact on public project quality in Palestine.

Sub-Hypotheses:

H1.1: The application of project cost management (PCM) has a positive impact on public project quality (PQ) in Palestine.

H1.2: The application of project resource management (PRM) has a positive impact on public project quality (PQ) in Palestine.

H1.3: The application of project procurement management (PPM) has a positive impact on public project quality (PQ) in Palestine.

H1.4: The application of project communications management (CM) has a positive impact on public project quality (PQ) in Palestine.

Table (7) and figures (4.3) and (8) show the research hypothesis analysis as follows:

Table (7) Path coefficients of the research hypothesis

	Std.□	Std. Error	T-Value	P-Value	Decision
H1: PMKA-> Project Quality	0.751	0.048	86.143	0.000	supported**
H1.1: PCM -> Project Quality	0.383	0.062	4.374	0.000	supported**
H1.2: PRM -> Project Quality	0.677	0.370	11.283	0.000	supported**
H1.3: PPM -> Project Quality	0.603	0.043	11.288	0.000	supported**
H1.4: CM-> Project Quality	0.606	0.043	3.582	0.001	supported**

Source: Researchers analysis **Significant **P≤ 0.01, *P≤ 0.05**

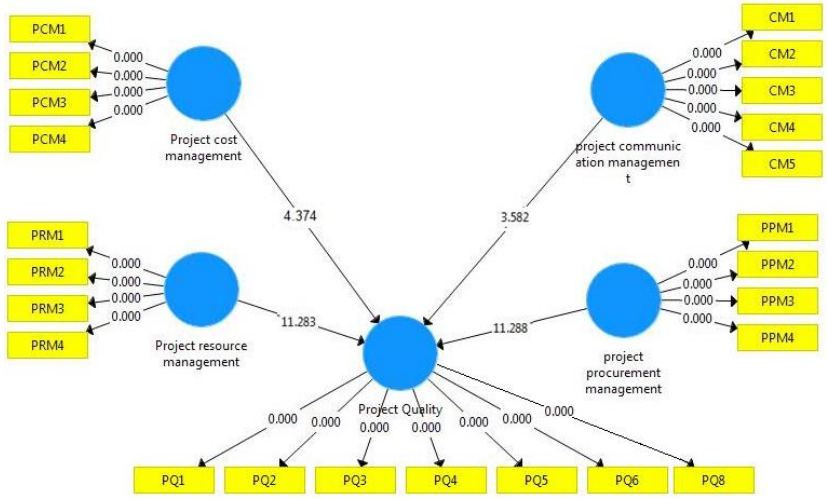

Figure (1) T-values

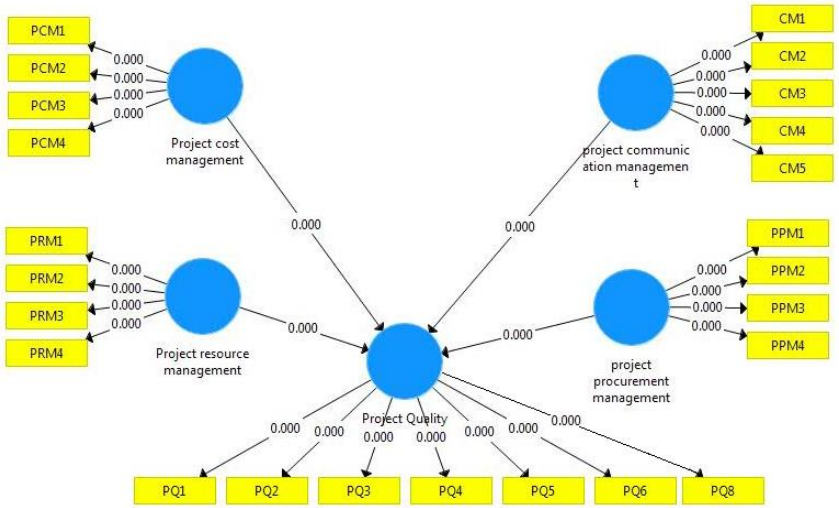

Figure (2) P-values

From Table (7) we find that the standard beta is positive, so the associations are positive, also we find that the values of (T) are significant at (P≤0.01) which indicates a strong significance level, and the hypothesis testing results are as follows:

- The main hypothesis **(H1)** which states that the application of PMKA's (cost, HR, communications, procurement) has a positive impact on public project quality in Palestine is accepted, with a T-value of 83.143, and a significance value of P= 0.000≤ 0.01, and Std.□ of 0.751 which indicates that the application of PMKA's (cost, HR, communications, procurement) has a significant and positive impact on public project quality in Palestine.
- The secondary hypothesis **(H1.1)** which states that the application of project cost management has a positive impact on public project quality in Palestine is

accepted, with a T-value of 4.374, and a significance value of P= 0.000≤ 0.01, and Std. of 0.383 which indicates that the application of project cost management has a significant and positive impact on public project quality in Palestine.

- The secondary hypothesis **(H1.2)** which states that the application of project resource management has a positive impact on public project quality in Palestine is accepted, with a T-value of 11.283, and a significance value of P= 0.000≤ 0.01, and Std. of 0.677 which indicates that the application of project resource management has a significant and positive impact on public project quality in Palestine.
- The secondary hypothesis **(H1.3)** which states that the application of project procurement management has a positive impact on public project quality in Palestine is accepted, with a T-value of 11.288, and a significance value of P= 0.000≤ 0.01, and Std. of 0.603 which indicates that the application of project procurement management has a significant and positive impact on public project quality in Palestine.
- The secondary hypothesis **(H1.4)** which states that the application of project communications management has a positive impact on public project quality in Palestine is accepted, with a T-value of 3.582, and a significance value of P= 0.001≤ 0.01, and Std. of 0.606 which indicates that the application of project communications management has a significant and positive impact on public project quality in Palestine.

Conclusion

The findings of this study are consistent with the findings of (Dahleez, 2017) in his study on the impact of PMKA's on NGO's project quality in Gaza, he found that resource and procurement management have a positive impact on public project quality, on the other hand, Dahleez found that communication and cost management don't have a positive and significant impact on project quality, which contradicts the finding of this study.

Another study on the implementation of strategic project management processes in major NGO's in Gaza (Bseiso, 2011), concluded that the planning and control processes are highly implemented in NGO projects which is consistent with this study's findings.

This study in researching the impact of project management on project quality is consistent with the studies of (Abdulla et al., 2019; Dumrak, Baroudi, & Hadjinicolaou, 2017; Enshassi, Arain, & El-Rayyes, 2014; Todorović, Petrović, Mihić, Obradović, & Bushuyev, 2015), in concluding that project management processes and knowledge areas have a positive impact on project quality, while they took deferent approaches in evaluating project quality they all came to the same conclusion.

This study is also consistent with the findings of (Faten Albtoush, Doh, Abdul Rahman, & Albtoush, 2020; Gao, 2020; Kossova & Sheluntcova, 2016; Vasista, 2017) regarding project cost management and its impact on project quality, as for communications management there was some studies that do not see that it has a significant effect on project quality like the studies of (Mahamid, 2013a; Mahamid, Bruland, & Dmaidi, 2012; Najmi, 2011), and others that found it has a positive effect on project quality like (Didehvar, Teymourifard, Mojtahedi, & Sepasgozar, 2018; Ghaben, 2015; Saleh, 2012; Todorović et al., 2015).

This study's findings is also consistent with most of the previous studies in regards to project procurement and resource management, in this regard (Abuazoom et al., 2019) found that implementing a sound project resource management plan is essential to project success which is consistent with this study's findings, and (Ingle & Mahesh, 2020; Javed & Liu, 2017; Kossova & Sheluntcova, 2016) found that project procurement management is one of the most important management areas responsible for project success.

Recommendations

The researcher's hereby recommends some steps that can be taken to improve project quality in the public project sector, mainly in MPWH and other relevant authorities:

- More attention should be given for each project to provide it with needed resources specially qualified human resources.
- The project management and project teams should have more exposure to international standard practices in public sector, including all aspects of project execution, planning, budgeting, project quality, project maintenance and serviceability.
- A clear code of practice should be adapted to evaluate project team's performance; this code should include parameters to reward the distinguished individuals and to take corrective actions for weak performing individuals among project teams.
- The communication protocols during all project stages must be clearly identified, and all involved personnel should be fully acquainted with them, and strictly adhere to each item of the protocol.
- The well known project management knowledge areas shall be adopted in all projects, this can be achieved by appointment of highly qualified team leader who is very well acquainted with PMKA's and have extensive similar expertise.
- All projects executed by the MPWH should have the highest standards and practices, although this seems very difficult but this is the most feasible practice to reduce or eliminate maintenance, changes and moderations.

Establishing a higher commission in the Palestinian government in charge of public project quality assurance and quality control to achieve the above recommendations.

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