

## **Empirical approach to examining the barriers to PPM success in project management offices within the public sector.**

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### **Abstract**

The importance of successful implementation of projects and portfolios has been a challenge for organizations since it requires proper management of human, technical and economic factors in order to achieve the desired goal. Thus, organizations have developed project management offices (PMOs) to accommodate for the increase in the number of projects that must be managed in terms of planning, execution, and final handover. Although most PMOs in organizations tends to focus on the success factors that increases the chance of portfolios success, the barriers that hinders their success in terms of portfolio project management can lead to failure in PMO's outcome. As such, Analytical Hierarchy Process (AHP) analysis will be used to priorterize the barriers, and the results will demonstrate the most prominent barriers that hinders the successful implementation of PPMs in PMOs. The study will target a case study in the emirate of Sharjah, which aims to explore and prioritize the underlying barriers that hinder the success of Portfolio Project Management (PPM) in Project Management Offices (PMOs) in the public sector within the emirate using a semi-structured survey with Subject Matter Experts (SMEs) working in PMOs within the public sector as well as middle and lower management employees within the field. The results indicated that portfolio governance criteria weight the highest among the main criteria, while leadership and lack of monitoring and control capabilities weighted the highest among the local criteria.

### **Keywords**

Project Portfolio Management; Barriers; Analytical Hierarchy Process; Project Management Office; Sharjah.

### **1. Introduction**

The project-based economy is estimated to be one third of the world's economy (Turner et al., 2013). Despite the benefits obtained from projects, the success rate of projects needs improvement according to a report in 2013 by the leading global project management association Project Management Institute (PMI) (Hubbard et al., 2015) (Standish Group, 2015) found that the success rate of projects is approximately 36% besides, project success rates dropped further by 7% when perceived value by the customer was added to the triple constraints of time, budget, and scope. The evaluation of success was traditionally on the triangle of scope, time, and budget but years later, other considerations were added by researchers to the success measurement of project. (Cooke-Davies, 2002) showed the difference between project management success when the traditional triple goals are met and project success when the project meets the organization goals. (Jugdev & Müller, 2005) explored the literature on project success for a long time and concluded that there is evidence for the need to incorporate several dimensions into measuring success as a comprehensive approach.

Organizations are more aware that their strategies are achieved through projects, thus they realize that strategic alignment with the proper selection of the projects is crucial for achieving the intent of strategies (Meskendahl, 2010). This is where project portfolio management comes into play especially when considering that organizations achieve only 63% of their strategies outcome (Mankins & Steele, 2005). Therefore, the project portfolio - defined as a set of projects that share and compete for scarce resources and are carried out under the sponsorship and management of a particular organization (Archer & Ghasemzadeh, 1999) is getting more importance.



**Fig. 1.** VOS Viewer for PPM Barriers topic studies

As seen from Figure 1 above, although barriers that affect successful implementation of project portfolio management in PMOs have been studied over the years in general, they may vary based on the region, industry, or organization type. The studies performed in the United Arab Emirates (UAE) are considered scarce from the shown figure. Hence, the aim of this study is to explore and prioritize the underlying barriers that hinder the success of PPM of PMOs in the public sector in one of the emirates in the UAE namely; the Emirate of Sharjah. It first explores the working procedures of PMOs nationally and internationally, then develops an understanding of how project's success rate is quantified by PMO's operating in the UAE and identifies the various barriers that undermine the success rate of projects handled by PMOs in the public sector within the emirate of Sharjah, finally it prioritizes the underlying barriers that affects the success of PPM in PMOs in the emirate of Sharjah.

In this paper, the barriers that prevent the implementation of PPM in PMO for Public sectors within Sharjah will be discussed. Several factors contribute to these barriers, which will be explained in detail in subsequent sections. One way to assess these barriers is through the use of multi-criteria decision-making (MCDM) analysis tools, which can help to rank, prioritize, and weigh the factors. To do so, it is important to understand the preferences of subject matter experts regarding the barriers that hinder PPM success. Therefore, the goal of this study is to use integrated MCDM methods to rank the barriers and quantify the success rate of projects undertaken by PMOs operating in the Emirate of Sharjah. The study aims to achieve four main research objectives. First to explore the working procedures of PMOs nationally and internationally then to develop an understanding of how project's success rate is quantified by PMO's operating in the UAE after that to identify the barriers that hinder the success of PPM in PMO within the Sharjah emirate government sectors lastly to Provide recommendations on the most critical barriers that affect the success of PPM in PMO's. The structure of the paper is as follows: Section 2 provides a review of literature related to similar research. The methodology and analysis used are presented in Section 3, and the findings are discussed in Section 4. Lastly, Section 5 provides conclusions drawn from the study and suggestions for future research.

## 2. Literature Review and Research Methodology

### 2.1 Project portfolio management

As defined by Project Management Institute (PMI) portfolio is "a collection of projects, programs, and other work that is grouped together to facilitate the effective management of that work to meet strategic business objectives" and Project Portfolio Management (PPM) is "the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other. Related work, in order to achieve specific strategic business objectives" (Ross & Shaltry, 2006). Another definition by (Cooper et al., 1997) is that PPM coordinates and control multiple projects that pursue the same strategic goals while competing for the same resources and prioritize projects accordingly. Moreover, (Blichfeldt & Eskerod, 2008) defined PPM as "the managerial activities that relate to, the initial screening, selection and prioritization of project proposals, the concurrent reprioritization of projects in the portfolio, and resource management for projects according to priority". In an organizational context, the management of project portfolio can be performed in different ways, including the most effective one is the founding of the Project Management Office (PMO) (Alexandrova et al., 2015). The management of portfolio through PMO is contemplated as a complex area in organizational practices, given the emerging challenges that need to be tackled by managers along with many opportunities to increase organizational effectiveness (Boneva, 2014). Such challenges are balancing of resources, project prioritization, project selection in conditions of uncertainty, decision to cease the implementation of failed projects, overall optimization of scope and the number of implemented projects in the portfolio (Cooper et al., 2000)(Staneva et al., 2014).

To assess the efficiency of PPM, (Cooper et al., 1997) estimated the portfolio success through measuring the degree of fulfilling the objectives towards strategic alignment, balance across projects, and value maximization. Despite the PPM frameworks and how they tend to optimize investments during portfolio planning, the portfolio management models are criticized. As such, the attention by managers given to portfolio activities are inadequate, and implicating employees with several projects will overload them (Elonen & Artto, 2003)(Henriksen & Traynor, 1999)(Zika-Viktorsson et al., 2006). One of the explanations to the former, is the lack of awareness of practice and context. Another one that might hinder the success of PPM is resource allocation, where projects must share their resources and knowledge, to diffuse good practices of PPM (Nobeoka & Cusumano, 1995). It has been reported that as the PPM maturity of an organization increases, the ability to achieve goals will increase eventually leading to higher PMO performance (Ko & Kim, 2019). PMO performance can be evaluated through several factors that affect its effectiveness and efficiency, which is discussed in the next section.

## *2.2 PMO Performance*

Several studies have shown that PMO projects implementation are prone to failure, such failures include; failure to reduce operating cost and failure high overhead cost (Ebad, 2016; Goedeke et al., 2017; Schibi, 2013). Furthermore, a preliminary survey conducted in Indonesia demonstrated a high failure rate of PMO implementation of Information Technology (IT) projects due to weak management standards and methodologies (Raharjo et al., 2018). Moreover, the factors leading to projects failure in PMOs can range from failing to meet milestones to ultimate project failure and therefore will result in efforts and financials wasted (Janssen et al., 2015). The factors are not limited to only meeting milestones within the allocated time, scope, or budget, but also can include complex variables such as stakeholder's expectation's, customers' requirements and market regulations which can render the equation to project success within PMOs even more complex and prone to failure (Ika, 2009; Janssen et al., 2015). Hence, there seems to be a need to assess the performance of PMOs within organizations to have a holistic view on the key indicators that will enhance the project success rate.

In order to assess the performance of PMOs within organizations, there are several Key Performance Indicators (KPI) used to measure the services offered by PMOs. It is noteworthy that there are multiple roles that PMOs undertake which includes 1) facilitation to select projects that aligns with the organization's strategic goals, 2) development of Organization Process Assets (OPAs) for all projects applied within the organization, 3) take the opportunity to educate and train all concerned parties within the organization to manage and deliver projects as per their standard procedures, 4) Supervise project activities execution through constant evaluations of the project life cycle until delivery (Bates, 1998; Bolles, 2002; Salameh, 2014; Whitten, 2000). As such, to assess the efficiency and effectiveness of PMOs, there must be an integrated performance measurement system to evaluate their level of performance. To elaborate, PMOs performance evaluation requires identifying the metrics which would be used to determine whether they achieved their strategic goals (Ntshwene et al., 2022), where a measurement system incorporates financial and resourcing, PMO governance and stakeholders' involvement (Philbin & Kaur, 2020). Consequently, there are different KPIs to measure the organizations capability on each metric.

From a project point of view, the dimensions to success can vary from project efficiency and team satisfaction to customer satisfaction and ultimate business success within the lifetime of a project (Serrador & Turner, 2014). However, PMOs contributes to the success of projects within a portfolio from a higher strategic view by applying standardized procedures including development of standard methodologies, provide mentoring for project managers, manage the selection of new projects and projects resource management (Alaray, 2016). Furthermore, a recent study in Iranian construction project-based organizations concluded that factors such as cost, procurement practices, communications, quality, and risk management contribute significantly towards projects success (Pirrotti, 2021). Moreover, a correlation study examined the effect of PMOs performance on IT organizations projects success, which revealed the significant indicators including project management practices, staff allocation, training and mentoring and project-related consulting (Petersen, 2020), which reflects the performance indicators of PMOs within the studied IT organizations. In addition, another study discusses the different scenarios where the PMO had an efficient role in defining and planning projects, perform benefit/cost analysis of the projects, supply of knowledge for the staff, develop standards and procedures for projects management and monitor and control the projects within the public administration institutions (Santos & Varajão, 2015).

The forementioned studies demonstrated an overview of the different KPIs that assess the performance of PMO in the context of different sectors including the public sector. However, the issue remains where there are no studies done on the barriers that can hinder the success of portfolios within public organizations specifically in the Emirate of Sharjah nor in the UAE.

### 2.3 PPM Barriers

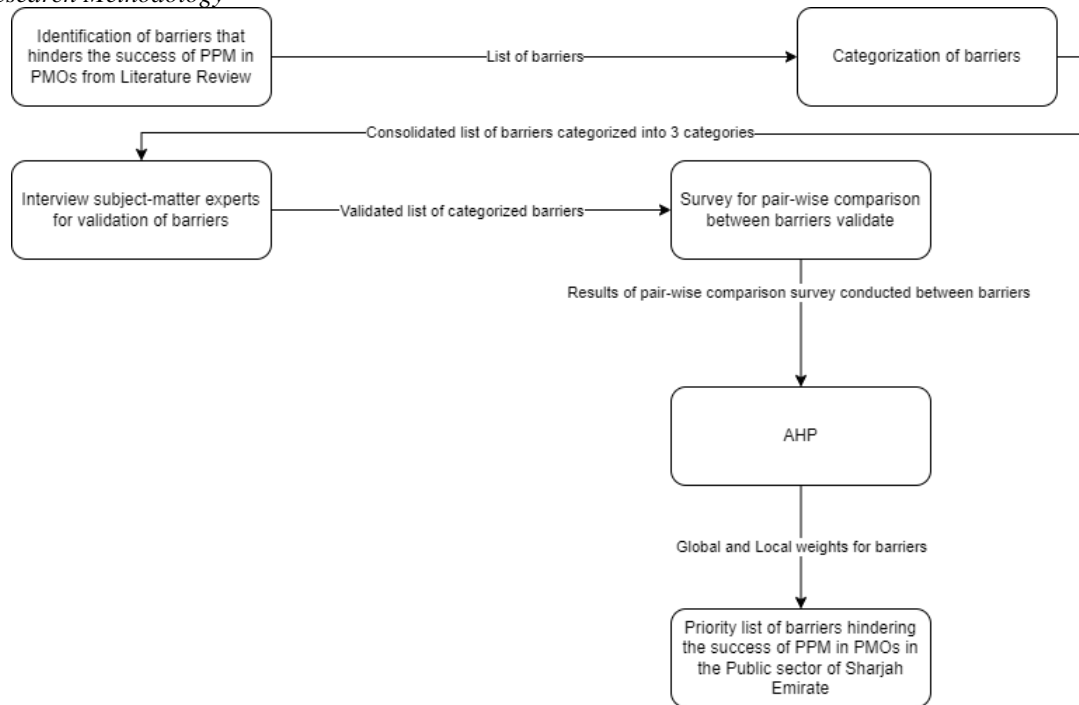
Deployment of a PPM in an organization has its challenges or barriers, such as the importance of importing data from other systems, ambiguity of roles and responsibilities, and the validity of performance factors for a better decision-making purpose (Jonas, 2010)(Moore, 2009). From a strategic perspective (Stentoft Arlbjørn et al., 2015) mentioned that a dynamic process to understand the benefit and value realization in project prioritization is missing. Due to the lack in the former capacity in the public sector, project prioritization and selection are based on subjective factors such as political influence and value perception. Hence, it has been concluded in the study that the absence of prioritization can act as a barrier in terms of a successful project portfolio management. This agrees with (Hadjinicolaou & Dumrak, 2017) examined a set of barriers in different sectors in Australia such as transportation and logistics, construction, and engineering, and governmental that hinders the implementation of PPM including internal politics and culture, lacking organizational management support, and disagreement on a common project prioritization approach. Other challenges can include lack of organizational support due to lack of a developed business strategy, change management issues, and system availability. Moreover, the author highlighted that resistance of employees towards PPM implementation, conveying information without taking any significant action, and disagreement on pace of adoptions are also barriers that affect the implementation of PPM.

Another factor that might affect the PPM success is the stakeholder's behavior, (Beringer et al., 2013) emphasized and focused on the portfolio-internal strategic stakeholder and how they play an important role in PPM since they are the core of it. Moreover, (Jonas, 2010) mentioned that negative influence of the top management involvement may hinder the PPM, where the author described it as "intervention", where it has a direct negative impact on the overall system success. Other barriers were also discussed by (Enoch, 2006) which were related to IT portfolio management. Where lack of executive sponsorship, support, and understanding ranked first. Followed by absence or poor implementation of a specific methodology to manage the portfolio, then the business demand for immediate delivery. Having discussed the barriers related to the success of PPM implementation in PMOs, the study will examine and prioritize them according to their weights. As such, multi-decision criteria tools will help in exploring the weights related to each barrier and accordingly draw conclusions.

**Table 1.** Barriers hindering the success of PPM implementation in PMOs

Barriers	References
Leadership / top management support	(Hadjinicolaou & Dumrak, 2017) (Stentoft Arlbjørn et al., 2015) (Oostuizen et al., 2018) (Enoch, 2006) (Jonas, 2010) (Eckert & Hüsigg, 2021a)
Lack of project selection and prioritization procedure	(Hadjinicolaou & Dumrak, 2017) (Stentoft Arlbjørn et al., 2015) (Enoch, 2006) (Hofman & Grela, 2018)
Lack of monitoring and control capabilities	(Hadjinicolaou & Dumrak, 2017) (Hofman & Grela, 2018) (Hofman et al., 2017)
IT Infrastructure not in place to support portfolio management	(Hadjinicolaou & Dumrak, 2017) (Daradkeh, 2019) (Micán et al., 2020)
Internal politics and culture of resistance to change	(Hadjinicolaou & Dumrak, 2017) (Stentoft Arlbjørn et al., 2015) (Daradkeh, 2019)
Stakeholder Support	(Daradkeh, 2019) (Stentoft Arlbjørn et al., 2015) (Eckert & Hüsigg, 2021b)
Project portfolio complexity	(Daradkeh, 2019) (Micán et al., 2020) (Eckert & Hüsigg, 2021b)
Resources are not allocated effectively	(Oostuizen et al., 2018) (Hadjinicolaou & Dumrak,

## 2.4 Research Methodology



**Fig. 2.** Research Methodology.

## 2.5 Study area and data collection

This study explores the barriers to successful project portfolio management (PPM) implementation in public sector organizations. The study will focus on the perspectives of experts in PPM and project management office (PMO) professionals in public sector organizations. The study will categorize then validate the barriers to PPM implementation using expert judgment. Ten experts in PPM and PMOs from various public sector organizations will be invited to participate in the study. The experts will receive an Excel sheet containing the list of barriers to PPM implementation and their corresponding categories. They will be asked to validate the list of barriers and suggest any additional barriers that they think are relevant to PPM implementation in public sector organizations. After validating the barriers with SME's, a survey will be conducted to collect data on the extent to which the identified barriers affect PPM implementation in public sector organizations. The survey will be conducted using a Google form and sent to project managers, program managers, and PMO professionals in public sector organizations in various countries. The sample size will be determined based on the rule of thumb that a minimum of 30 respondents is needed to ensure adequate statistical power. The survey will include questions on the respondents' demographic information, their organization's characteristics, and the barriers to PPM implementation they have experienced in their organizations. The ESMS will be asked to rate the barriers on a scale of 1 to 9, where 1 means the barrier has neutral effect, and 9 means the barrier is having a significant impact on PPM success relative to the other barrier. The collected data will be analyzed using descriptive statistics to identify the most significant barriers to PPM implementation in public sector organizations. The data will be presented using tables, graphs, and charts to clearly understand the results. Finally, the results will be discussed, and recommendations for addressing the identified barriers will be presented.

## 2.6 Barrier's identification through Literature Review

Barriers of project portfolio management (PPM) in project management offices (PMOs) have been identified through various literature reviews conducted by scholars and practitioners in the field of project management. Also, an investigation of how PMO global alliance functions have been done, their procedure, aims, and experiences. One of the primary barriers identified in the literature is the lack of senior management support for PPM implementation. Without strong support from senior management, PMOs may struggle to secure the necessary resources and buy-in from stakeholders to effectively implement PPM. Another barrier identified is the lack of clear and consistent project selection criteria. PMOs may struggle to identify the most valuable projects to prioritize within their portfolio if there are no established criteria for evaluating and comparing project proposals. In addition, the lack of standardized processes and tools for PPM can create significant barriers to successful implementation. Without a consistent approach to PPM, PMOs may struggle to effectively manage and monitor their portfolio, leading to missed opportunities and inefficient resource allocation. Finally, effective PPM in PMO requires metrics and reporting capabilities that provide insights into project performance and portfolio health. However, many organizations lack adequate metrics and reporting capabilities, which can make it challenging to make informed decisions about the portfolio. Several interviews were conducted to investigate the barriers that employees working in the Project Management Office (PMO) face. The interviewees included PMO employees and those working with the PMO. All interviewees were under pressure to meet strict deadlines and complete important projects within specific time limits. One of the interviewees was the Director of Inspection and Control, who oversaw a systematic inspection operation that needed to be completed on time. During the interviews, all the barriers that had been identified in the literature were presented, and interviewees were asked to provide additional barriers that they had experienced but were not captured in the literature. In total, 10 employees from the public sector in Sharjah were interviewed to either validate the barriers found in the literature or add barriers. These interviews were crucial in identifying the key challenges and obstacles that the PMO employees face, including time constraints, lack of resources, poor communication, and resistance to change. In addition, the interviews also highlighted some specific challenges that were unique to the Sharjah context. For example, the interviews revealed that cultural differences and language barriers could pose significant challenges for PMO employees when communicating with stakeholders. The interviews provided valuable insights into the challenges faced by PMO employees in Sharjah, which can help in developing strategies to overcome these barriers and improve the efficiency and effectiveness of the PMO. Overall, these barriers highlight the importance of strong leadership support, clear project selection criteria, standardized processes and tools, inadequate metrics and reporting, proper data collection, sponsorship, and effective change management strategies in successfully implementing PPM within a PMO.

## 2.7 Barrier's categorization and criteria selection.

This study aims to categorize the barriers that hinder the success of project portfolio management in PMOs within the Public sector of the UAE. The barriers identified through literature and validated by Subject Matter Experts (SMEs) as illustrated in Table 1, then categorized in three categories namely; (1) People, (2) Selection, and (3) Portfolio Governance. The categorization process was done through validation interviews with SMEs as well as the experience of the authors in the subject as seen in Table 2.

**Table 2.** Categorized Barriers.

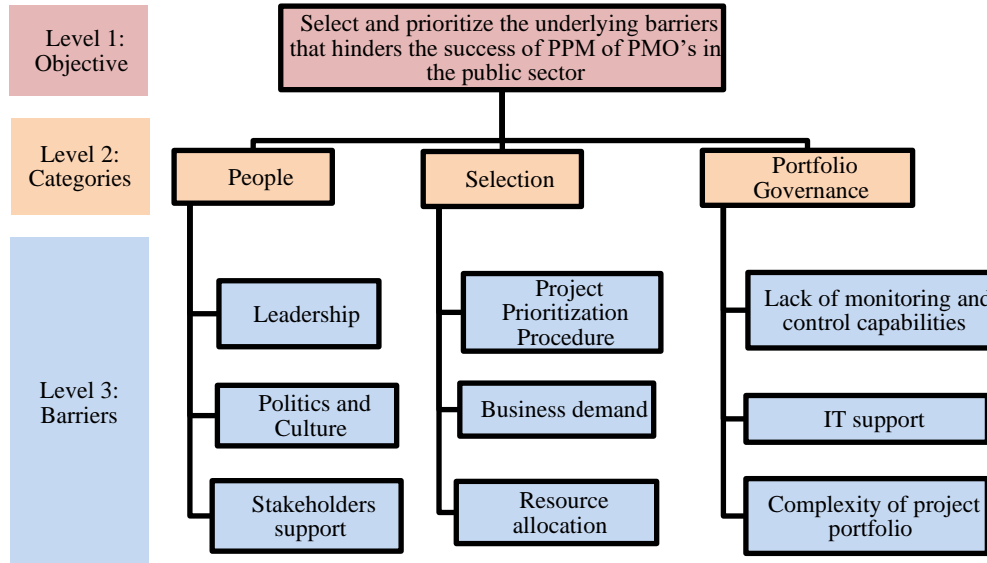
Main Category	Barriers	References
<b>People</b>	Leadership	(Hadjinicolaou & Dumrak, 2017) (Stentoft Arlbjørn et al., 2015) (Oostuizen et al., 2018) (Enoch, 2006) (Jonas, 2010) (Eckert & Hüsigg, 2021a)
	Politics and Culture	(Hadjinicolaou & Dumrak, 2017) (Stentoft Arlbjørn et al., 2015) (Daradkeh, 2019)
	Stakeholders Support	(Daradkeh, 2019) (Stentoft Arlbjørn et al., 2015) (Eckert & Hüsigg, 2021b)
<b>Selection</b>	Project Prioritization Procedure	(Hadjinicolaou & Dumrak, 2017) (Stentoft Arlbjørn et al., 2015) (Enoch, 2006) (Hofman & Grela, 2018)

	Business Demand	(Enoch, 2006) (Micán et al., 2020) (Eckert & Hüsig, 2021b)
	Resource allocation	(Oostuizen et al., 2018) (Hadjinicolaou & Dumrak, 2017) (Hofman & Grela, 2018) (Micán et al., 2020)
<b>Portfolio Governance</b>	Lack of monitoring and control capabilities	(Hadjinicolaou & Dumrak, 2017) (Hofman & Grela, 2018) (Hofman et al., 2017)
	IT Support	(Hadjinicolaou & Dumrak, 2017) (Daradkeh, 2019) (Micán et al., 2020)
	Complexity of project portfolio	(Daradkeh, 2019) (Micán et al., 2020) (Eckert & Hüsig, 2021b)

Leadership refers to the lack of broad organizational support, responsibility to manage processes, and no commitment from top management towards regulating the process of project portfolio management in their PMOs. Moreover, Politics and Culture refers to the internal resistance of the organization to change and adapt with variabilities in PPM. Stakeholders support relates to the relationships and satisfaction of stakeholders, as well as their key values in terms of financial support and knowledge of the organization's portfolio. The mentioned sub-criteria are grouped to a common category, namely people. This category reflects the interaction between concerned individuals.

Project Prioritization Procedure relates to the difficulty to reach a common approach when selecting and categorizing projects according to their importance within the organization, which hinders the success of the portfolio within PMOs. Moreover, the Business Demand refers to the market need for a specific project or program to be completed, which in return can affect the selection process within a portfolio management office. Resource allocation refers to the process of distributing and assigning resources (financial or non-financial) among selected projects that aligns with the strategic objectives of the organizations. The mentioned sub-criteria are grouped to a common category named selection, which refers to the systematic method of evaluating and choosing projects to include in the portfolio. In addition, it ensures that the portfolio includes the most valuable and relevant projects that support the organization's strategic objectives. Lack of monitoring and control capabilities refers to the inadequacy of processes to track the performance portfolio performance and its outcomes. IT Support relates to the absence of IT infrastructure to support portfolio management and the unavailability of systems to provide real-time data to assess the performance of portfolio management within PMOs. Complexity of project portfolio refers to the challenge of managing a diverse range of projects with varying objectives, stakeholders, and resource requirements across different government entities. It includes managing multiple dependencies and risks, ensuring alignment with the government's strategy and goals, and balancing competing demands for resources and funding. The mentioned sub-criteria are grouped to a common category named portfolio governance, refers to the monitoring and control capabilities that are used to manage the complexity of a portfolio of projects in the emirate of Sharjah. This includes leveraging IT support to provide real-time visibility into project status, risk, and performance. It also involves the establishment of governance structures to ensure that portfolio decisions are aligned with organizational objectives and are consistent with best practices.

## 2.8 Analytical hierarchy process (AHP)



**Fig. 3.** AHP Hierarchy Model.

One of the effective tools that can be used to understand and address the barriers in project portfolio management (PPM) within the public sector in the UAE is Analytic Hierarchy Process (AHP). By definition, it is a multi-criteria decision-making method that helps to identify and select projects to prioritize in a portfolio and was developed by Saaty in 1980 (Danesh et al., 2015). In an unexplored environment such as the public sector in UAE, applying AHP offers a structured approach to the stakeholders to evaluate and rank barriers that hinder the success of the projects in PPM and order them according to the attention they require to execute the projects. Prioritization of projects mostly depends on the cost-benefit analysis as those projects with higher benefits compared to costs are prioritized (Danesh et al., 2015). Other applications used AHP to evaluate, assess and select between different alternatives. In project portfolio management sector, (Hashemizadeh & Ju, 2019) discussed the usage of AHP with TOPSIS and geographic information system (GIS) to select project portfolio which depends on multiple criteria. The aim of their paper is to obtain score for projects alternatives then to rank the projects' scores based on different criteria after that GIS sheet is prepared to present the projects scores list with different alternatives. Several other studies recognize the significance of AHP in selecting and prioritizing barriers in a portfolio to ensure project success in various industries (Jabbarzadeh, 2018). The study conducted in (Gunduz & Almuajebh, 2020) evaluated the effect of categorizing barriers or factors using the AHP model on project success. The findings showed that the prioritized barriers led to better identification and implementation of problem-solving tools in decision-making and the overall success of projects in the construction industry. Another research (Naseem et al., 2023) evaluated the use of the AHP approach in ranking barriers that contribute to the complexities and uncertainty in decision-making in the field of supply chain management and blockchain adoption in Pakistan. The results indicate that stakeholders could rank these barriers according to their complexities and provide recommendations that would assist in the success of the projects. The AHP approach has also been a critical tool in project management offices (PMOs) to enhance the decision-making process and develop effective strategies to ensure project success. Research shows that if PMOs are structured properly with the right staff and leadership and appropriately utilize AHP in decision-making, they develop effective strategies for project success in PMOs through a structured selection and prioritization process (Ershadi et al., 2021). Utilization of AHP in prioritizing effective strategies to implement projects enables PMOs to move from basic functions of project administration to nurturing the projects, strategically managing the projects, and initiating changes in project portfolios. As such, integrating AHP tools in the PMOs in the UAE public sector can effectively help introduce effective strategies to overcome the barriers in project portfolio management. AHP tools would be effective in helping the stakeholders in UAE public sector understand the barriers that hinder the success of PPM. Studies show that limited



research has been conducted exploring the barriers to the success of project portfolio management using the AHP technique (Alblooshi et al., 2022). The use of the AHP approach provides a functional pathway and criteria to provide an unbiased and transparent evaluation process of barriers that stakeholders can easily comprehend compared to other methodologies, such as MCDM. According to research (Alrahbi et al., 2021), the AHP model provides an effective way to reduce the complexity of decisions by offering a wide range of comparisons in a hierarchical structure that analyzes both the subjective and objective dimensions of strategies adopted under a set criteria and sub-criteria. This approach could be critical in analyzing the decision made in various public sectors, such as healthcare and selecting the priorities to guide decision-makers to overcome different obstacles that inhibit the success of PPM.

Overall, the integration of the AHP technique in PPM within the public sector of the UAE offers an immeasurable contribution to the stakeholders to identify, select, and prioritize strategies to overcome barriers to project management success. Various studies agree that AHP offers a structured approach to rank the barriers depending on the focus industry and reduce complexities in the decision-making process. Consequently, the technique improves the roles of PMOs from being basic project management roles to initiating change, nurturing projects, and developing strategic approaches to overcome barriers. AHP tools are also critical in understanding and unraveling the complexities in decision-making through a transparent and unbiased evaluation process which could be effective in various public sectors in UAE. The factors in the hierarchy are compared as binaries to determine their importance in relation to higher-level components. Pairwise comparison is used by AHP to assess the relative importance of each component in the hierarchy. To represent relative importance, AHP typically employs a 1-9 scale, with 1 being equally important and 9 being extremely important. This study adopts the following structure to decompose the problem to a multi-level of criteria.

The consistency index (CI) formula is shown in Equation 1:

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (1)$$

where n is the number of the criteria compared, and  $\lambda_{max}$  is the maximum eigenvalue in the matrix. Then, the degree of consistency calculated by Equation 2.

$$C.R. = \frac{CI}{RCI} \quad (2)$$

### 3. Data Analysis and Results

Upon the data collection of the barriers hindering the success of project portfolio management in PMOs from the literature and their validation through experts within the public sectors in the UAE as illustrated in table 2. A pair-wise comparison survey is conducted to serve as an input for the analytical hierarchy process to prioritize the barriers selected during the data collection process in the UAE. The survey was distributed to employees working in project management offices within their respective governmental entities and subject experts employed within public sectors from different job positions including; top-level management (3.1%), middle-level management (75%), and low-level management (21.9%). Moreover, in terms of working experience, 18.8% had 11 to 20 years of experience and 43.8% had 5 to 10 years of experience. The results also showed that out of the 32 responses, 81.3% included responses from organizations that had a PMO and 18.8% did not. Given the survey responses, an AHP analysis is conducted to quantify the criteria and alternative options in the survey to prioritize the barriers selected previously. For the 32 responses, a pair-wise comparison matrix is constructed for the three main criteria and their sub-criteria accordingly using Saaty's scale (1-9). In terms of the main criteria, Portfolio Governance ranked first with 50% weight, followed by People 36% and lastly Selection 18%. Furthermore, on the sub-criteria scale, under the Portfolio Governance, the Lack of Monitoring & Control Capabilities ranked first with a 47% weight. As for the People criteria, the Leadership is ranked first with 49% and lastly for the Selection criteria, the Project Prioritization Procedure ranked first with 41%. Table 3 illustrates the global and local weights from the AHP analysis conducted on all main and sub criteria.

**Table 3.** Obtained weights for the AHP analysis.

Main Criteria	Global	Sub-Criteria	Local	Rank
M1: People	0.36	Leadership	0.49	1
		Politics & Culture	0.28	6
		Stakeholder Support	0.228	8
M2: Selection	0.18	Project prioritization procedure	0.41	3

		Business demand	0.227	7
		Resource allocation	0.36	4
M3: Portfolio Governance	0.5	Lack of monitoring & control capabilities	0.47	2
		IT support	0.18	9
		Complexity of project portfolio	0.34	5

The study was conducted through semi-structured interviews with PMO employees in different organizations within the public sector of the UAE. The interviews were conducted face-to-face and online, depending on the preference of the interviewee. The participants were selected using purposive sampling, which involves selecting participants who have experience working in a PMO and are involved in the implementation of PPM to ensure that the responses are recorded from valid participants. Furthermore, the interview questions were developed based on the literature review. The questions were specific to the barriers found in the literature review and the line of questioning allowed for open-ended question to allow participants to express their thoughts and opinions freely, which can help in developing new questions or identifying new barriers that were not mentioned in the literature review. The interview questions will be pilot tested with PMO employees before the actual interviews to ensure clarity and comprehensibility. The trustworthiness of the research findings was ensured through credibility, transferability, dependability, and confirmability. Credibility was ensured by conducting interviews with a diverse group of participants, pilot-testing the interview questions, and using member-checking to verify the accuracy of the findings. Transferability was ensured by providing a detailed description of the research design, data collection, and analysis methods. Dependability was ensured by using a standardized interview protocol, conducting interviews by the same researcher, and documenting the research process. Confirmability was ensured by using an audit trail, where the research process and decisions made are documented and can be traced. As for the data analysis, the consistency ratio (CR) values were calculated for the AHP, which reported values less than 0.1 (10%) as recommended by Saaty (Saaty, 1989).

## 4. Discussion

The results obtained from prioritizing the barriers hindering the success of portfolio project management offices within the Sharjah's public sector can provide unique insight for top management decision makers working currently in public sectors and can serve as an input to PMOs during the planning, selection and execution phases of projects handled by governmental entities. The 30 responses from individuals working in PMOs within the public sector and subject experts provided reasonable answers which compliments the literature of the paper by indicating the portfolio governance as the highest barrier can hinder the progress or success of projects portfolios.

### 4.1 People context

Furthermore, in terms of people interactions barriers, leadership constitutes a vital role affecting the success of project portfolio through their involvement with PMOs milestones and commitment towards their set vision and missions to achieve a certain outcome that the project portfolio will aim for. However, the role of leadership can be viewed as a hindrance to the PPM success or failure depending on the viewpoint of the top management, internal politics, or sudden changes in leadership positions, which explains the analysis outcome of this research by allocating the majority local weight on that sub-criterion. This is reflected by the leadership influence in public entities operating within the Emirate of Sharjah. Governmental entities operating within the emirate. This is also supported by the case represented in (Unger et al., 2012), where it stated that PMOs are initiated by the influence organization's leadership and their roles and responsibilities require interference from the top management to ensure their success towards achieving the organization's strategic goals.

As stated previously, leadership can be influenced by the politics and culture of the organization and their internal resistances to change. From the results, it shows that it is not the case within public sectors operating in the emirate of Sharjah, which explains how the internal standard procedures and the cascading of decisions are aligned with the entity's strategic goals and in consensus with the employees working within the government entity. This might not be the case with public sectors in other countries, as suggested by (Elliott, 1997) ,it shows that such barrier can be a hindrance to PMOs to be successful in achieving their PPM goals. This difference provides a closer look at how PMOs in the public sector are operating within the emirate in terms of change management and internal resistances to leadership. This is also supported by the stakeholders' support and engagement in hindering the success of PMOs within the public sector, as it is ranked one of the lowest barriers in comparison to others. From the results, it is shown

that the relationships between the governmental entities in the emirate of Sharjah and their stakeholders do not constitute a considerable barrier to the success of project portfolios. People of the public are usually served based on their demand from public entities, which in return supports the success of projects. Moreover, contractors and general beneficiaries of the governmental entities in the emirate supports PMOs in their mission to achieve their intended objectives and as such this represents one of the lowest barriers to hinder the PMOs performance in terms of PPM (Maassen, 2013).

#### *4.2 Selection context*

The selection criteria entail the methods of evaluating and selecting projects in the portfolio including project prioritization procedures, business demand, and resource allocation. It ranked the least when compared to people and portfolio governance. Choosing projects within a portfolio of public organizations in the studied geographical area is not considered a huge barrier to hinder the success of portfolio management as shown by the respondents. This could be because project selection procedures are pondered to be an internal workflow and differs from one governmental entity to another. Yet, project prioritization procedures ranked the third among all sub-criteria. Which sheds light on the importance of having a unified approach for project selection and categorization. Moreover, resource allocation ranked the fourth among all sub-criteria, which means that not having an optimized resource allocation to execute the intended projects that aligns with organization's strategic objectives will hinder the success of portfolio management (Taylor et al., 2015). Just as the case in public sectors within the Emirate of Sharjah, in which some of the governmental entities are restricted in terms of financial resources from the central government, resource allocation for projects execution is a crucial barrier that can hinder the performance of PMOs and portfolio management. Moreover, the Business demand for projects is ranked within the lower spectrum of sub-criteria this is due to external and internal influences that shape the selection of projects such as public complaints and top management directions within the governmental entities in the Emirate of Sharjah (Tahri & Drissi-Kaitouni, 2015).

#### *4.3 Portfolio governance*

The importance of Portfolio Governance within PMOs in the public sector and the ability of project or portfolio managers to monitor and control the progress and provide direction aligns with the complexity of the project portfolio, where the complexity of the portfolio can have an impact on the control and monitoring capabilities of the employees (Teller et al., 2012a). This is supported by (Mosavi, 2014) and is aided by the data shown. Furthermore, the public sector within the geographical context established committees to implement PPM and study the previous statistics of projects that were executed in the past so a proper decision would be taken based on the committee recommendations (Mosavi, 2014). Consequently, this will enable project/portfolio managers within the government entity to scale up to the more complex portfolios targeted by the entity. The complexity of project portfolio is ranked within mid-range of the sub-criteria, which illustrates the importance of scaling the complexity of projects to the competencies available in the government entity. Furthermore, in the context of the public sector in Sharjah, this supports the current selection requirements of project/portfolio managers and their respective team members to the projects selected in PMOs. The capabilities of project managers to handle complex project portfolios is crucial since it can affect their monitoring and control capabilities and the overall success of project portfolios within the entity (Kopmann et al., 2015). As a supporting unit to PMOs, the information technology (IT) infrastructure availability needs to be considered to govern and handle project portfolios. As shown from the results, IT support is relatively not very high and important compared to other sub criteria. This is because public sectors in the emirate of Sharjah have their IT infrastructure inside the organization as an internal department which eases the facilitation of their services to aid in the progress and development of projects instead of being viewed as a hurdle or barrier to achieve project portfolio success. Moreover, in terms of IT project portfolios, most of projects deal with digital transformation of analog services offered to the public into digital services that can be executed on an online platform. Rather the quantity of projects handled in the emirate typically falls under construction or transformative manufacturing projects, which requires the support of IT infrastructure to achieve its goal. Not only UAE, PwC stated that the projects related to IT has a shortage of effective program and portfolio management in public settings, which exacerbates these problems with methodology and capability at the project level. Frequently, these capacities and methods are not sufficiently available, and there is a failure to acknowledge their importance in the first place (PwC, ). In the Emirate of Sharjah, PMOs operating within the governmental entities perceive the governance of project portfolios in the context of monitoring and control capabilities, and its relationship with the complexity of the projects approved from senior management to be the utmost barrier that hinders their success. Moreover, the support from the leadership of the governmental entities constitutes a

vital role in that relationship, since the choice of appointing project managers, and selection of projects relies heavily on their decision-making capabilities and engagement in achieving their organization's strategic goals.

## **5. Conclusions**

The highest weight discovered for the main criteria is the Portfolio Governance. Where the lack of monitoring and controlling ranked the second highest barrier that affects the success of PPM in PMO's. Currently, there are various metrics that can help the public sector in building a rich portfolio such as, mortality rate is a metric used to measure the number of projects that do not make it to the portfolio or remain unfinished. It can be evaluated at each stage in the portfolio management process. There are two ways to measure mortality rates: one is by calculating the percentage of total project requests that are terminated at each stage, and the other is by examining the percentage of surviving projects that are terminated at each gate or filter control (Rosenstock, 2002). As a result, most of the projects are controlled which will narrow down the list of projects created and select the best projects that preserve benefits and enrich the portfolio. Aligning projects with the objectives of the organization is one of the most effective aspects of minimizing the project's complexity. This aspect defines the status of the organization where the aim and goals are defined properly. Second aspect that contributes toward minimizing the project complexity is the people, where the organization should have a project manager that is trained in various PPM tools, concepts and educated in managing the interdependencies of the projects within the portfolio (Teller et al., 2012b). In which each project has defined scope, objects, timeline, and deliverables. Lack of resource allocation could cause complexity in some of the projects when all the resources are used by other projects, leading to a shortage of resources and inefficient use of resources (Filippov et al., 2010). The study has provided a closer look at the barriers that hinder the success of project portfolio management in the public sector within the emirate of Sharjah. This study paves the way for future comparative studies in different emirates given how different they are governed. Building upon the findings of the research, different sets of barriers can be explored in different emirates, which can suggest different solutions and strategies to best manage project portfolios. In addition, this study can help in exploring the relationship between the barriers and to what extent they can affect the success of PPM in public sectors in various emirates. This can be achieved using Analytic Network Process (ANP) to provide analysis with comprehensive framework related to people, governance, and selection.

## References

- Alaray, N. (2016). No title. *A Governance Approach: Exploring the PMO Characteristics on Project Success and Failure*.
- Alblooshi, B. G. K. M., Ahmad, S. Z., Hussain, M., & Singh, S. K. (2022). Sustainable management of electronic waste: Empirical evidences from a stakeholders' perspective. *Business Strategy and the Environment*, 31(4), 1856-1874.
- Alexandrova, M., Stankova, L., & Gelemenov, A. (2015). The role of project office for project portfolio management. *Economic Alternatives*, 1(1), 19-30.
- Alrahbi, D., Khan, M., & Hussain, M. (2021). Exploring the motivators of technology adoption in healthcare. *International Journal of Healthcare Management*, 14(1), 50-63.
- Archer, N. P., & Ghasemzadeh, F. (1999). An integrated framework for project portfolio selection. *International Journal of Project Management*, 17(4), 207-216.
- Bates, W. S. (1998). Improving project management: Better project management begins with a project management office. *IIE Solutions*, 30(10), 42-44.
- Beringer, C., Jonas, D., & Kock, A. (2013). Behavior of internal stakeholders in project portfolio management and its impact on success. *International Journal of Project Management*, 31(6), 830-846. 10.1016/j.ijproman.2012.11.006
- Blichfeldt, B. S., & Eskerod, P. (2008). Project portfolio management – There's more to it than what management enacts. *International Journal of Project Management*, 26(4), 357-365. 10.1016/j.ijproman.2007.06.004
- Bolles, D. (2002). *Building Project-Management Centers of Excellence*. AMACOM Div American Mgmt Assn.
- Boneva, S. (2014). First level control of projects implemented under the framework of European Territorial Cooperation programs in Bulgaria. *Bulgarian Economy—The Road to the Euro*, UNWE Publishing Complex, Sofia, , 433-444.
- Cooke-Davies, T. (2002). The “real” success factors on projects. *International Journal of Project Management*, 20(3), 185-190.
- Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (1997). Portfolio management in new product development: Lessons from the leaders—I. *Research-Technology Management*, 40(5), 16-28.
- Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2000). New problems, new solutions: making portfolio management more effective. *Research-Technology Management*, 43(2), 18-33.
- Danesh, D., Ryan, M. J., & Abbasi, A. (2015). Using analytic hierarchy process as a decision-making tool in project portfolio management. *WASET International Journal of Economics and Management Engineering*, 9(12), 4194-4204.
- Daradkeh, M. (2019). Understanding the factors affecting the adoption of project portfolio management software through topic modeling of online software reviews. *International Journal of Information Technology Project Management (IJITPM)*, 10(3), 91-114.
- Ebad, S. A. (2016). Influencing Factors for IT Software Project Failures in Developing Countries-A Critical Literature Survey. *J.Softw.*, 11(11), 1145-1153.
- Eckert, T., & Hüsig, S. (2021a). Innovation portfolio management: A systematic review and research agenda in regards to digital service innovations. *Management Review Quarterly*, , 1-44.
- Eckert, T., & Hüsig, S. (2021b). Innovation portfolio management: A systematic review and research agenda in regards to digital service innovations. *Management Review Quarterly*, , 1-44.
- Elliott, J. (1997). *Tourism: Politics and public sector management*. Psychology Press.
- Elonen, S., & Artto, K. A. (2003). Problems in managing internal development projects in multi-project environments. *International Journal of Project Management*, 21(6), 395-402.
- Enoch, C. N. (2006). *IT Portfolio Management: Barriers to Adoption and Strategies for Overcoming Them* Available from IT Portfolio Management: Barriers to Adoption and Strategies for Overcoming Them
- Ershadi, M., Jefferies, M., Davis, P., & Mojtahedi, M. (2021). Project management offices in the construction industry: a literature review and qualitative synthesis of success variables. *Construction Management and Economics*, 39(6), 493-512.
- Filippov, S., Mooi, H., & van der Weg, R. (2010). The strategic role of project portfolio management: Evidence from the Netherlands. Paper presented at the *Proceedings of the 7th International Conference on Innovation & Management*, 648-659.
- Goedeke, J., Mueller, M., & Pankratz, O. (2017). Uncovering the causes of information system project failure.
- Gunduz, M., & Almuajebh, M. (2020). Critical success factors for sustainable construction project management. *Sustainability*, 12(5), 1990.

- Hadjinicolaou, N., & Dumrak, J. (2017). Investigating association of benefits and barriers in project portfolio management to project success. *Procedia Engineering*, 182, 274-281.
- Hashemizadeh, A., & Ju, Y. (2019). Project portfolio selection for construction contractors by MCDM–GIS approach. *International Journal of Environmental Science and Technology*, 16, 8283-8296.
- Henriksen, A. D., & Traynor, A. J. (1999). A practical R&D project-selection scoring tool. *IEEE Transactions on Engineering Management*, 46(2), 158-170.
- Hofman, M., & Grela, G. (2018). Project portfolio risk categorisation–factor analysis results. *International Journal of Information Systems and Project Management*, 6(4), 39-58.
- Hofman, M., Spalek, S., & Grela, G. (2017). Shedding new light on project portfolio risk management. *Sustainability*, 9(10), 1798.
- Hubbard, D. G., Bolles, D. L., & PMP, P. (2015). PMO Framework and PMO Models for Project Business Management. *PM World Journal*, 4(1), 1-22.
- Ika, L. A. (2009). Project success as a topic in project management journals. *Project Management Journal*, 40(4), 6-19.
- Jabbarzadeh, A. (2018). Application of the AHP and TOPSIS in project management. *Journal of Project Management*, 3(2), 125-130.
- Janssen, M., Van Der Voort, H., & van Veenstra, A. F. (2015). Failure of large transformation projects from the viewpoint of complex adaptive systems: Management principles for dealing with project dynamics. *Information Systems Frontiers*, 17, 15-29.
- Jonas, D. (2010). Empowering project portfolio managers: How management involvement impacts project portfolio management performance. *International Journal of Project Management*, 28(8), 818-831. 10.1016/j.ijproman.2010.07.002
- Jugdev, K., & Müller, R. (2005). A retrospective look at our evolving understanding of project success. *Project Management Journal*, 36(4), 19-31.
- Ko, J. H., & Kim, D. (2019). The effects of maturity of project portfolio management and business alignment on PMO efficiency. *Sustainability*, 11(1), 238.
- Kopmann, J., Kock, A., Killen, C. P., & Gemünden, H. G. (2015). Business case control in project portfolios—an empirical investigation of performance consequences and moderating effects. *IEEE Transactions on Engineering Management*, 62(4), 529-543.
- Maassen, S. G. (2013). *Governance and Control of PPM in the Semi-public Sector*
- Mankins, M. C., & Steele, R. (2005). Turning great strategy into great performance. *Harvard Business Review*, 2607
- Meskendahl, S. (2010). The influence of business strategy on project portfolio management and its success—A conceptual framework. *International Journal of Project Management*, 28(8), 807-817.
- Micán, C., Fernandes, G., & Araújo, M. (2020). Project portfolio risk management: a structured literature review with future directions for research. *International Journal of Information Systems and Project Management*, 8(3), 67-84.
- Moore, S. (2009). *Strategic project portfolio management: enabling a productive organization*. John Wiley & Sons.
- Mosavi, A. (2014). Exploring the roles of portfolio steering committees in project portfolio governance. *International Journal of Project Management*, 32(3), 388-399.
- Naseem, M. H., Yang, J., Zhang, T., & Alam, W. (2023). Utilizing Fuzzy AHP in the Evaluation of Barriers to Blockchain Implementation in Reverse Logistics. *Sustainability*, 15(10), 7961.
- Nobeoka, K., & Cusumano, M. A. (1995). Multiproject strategy, design transfer, and project performance: a survey of automobile development projects in the US and Japan. *IEEE Transactions on Engineering Management*, 42(4), 397-409.
- Ntshwene, K., Ssegawa, J. K., & Rwelamila, P. D. (2022). Key performance indicators (KPIs) for measuring PMOs services in selected organisations in Botswana. *Procedia Computer Science*, 196, 964-972.
- Oostuizen, C., Grobbelaar, S. S., & Bam, W. G. (2018). Project portfolio management best practice and implementation: A South African perspective. *International Journal of Innovation and Technology Management*, 15(04), 1850036.
- Petersen, K. W. (2020). No title. *Project Management Office Performance Variables that Influence Project Success: A Correlational Study*,
- Philbin, S. P., & Kaur, R. (2020). Measuring PMO Performance—Application of the balanced scorecard in a collaborative research context. *The Journal of Modern Project Management*, 7(4)
- Pirotti, A. (2021). Implementation of Project Management Standards and Project Success: The Mediating Role of the Project Management Office. *Pirotti, A., Rahim, FAM, and Zakaria*, (2022), 39-46.

- PwC. *Are Public projects doomed to failure from the start?* <https://www.pwc.ch/en/insights/public-sector/are-public-projects-doomed-to-fail.html>
- Raharjo, T., Purwandari, B., Satria, R., & Solichah, I. (2018). Critical success factors for project management office: An insight from Indonesia. Paper presented at the *2018 Third International Conference on Informatics and Computing (ICIC)*, 1-6.
- Rosenstock, (2002) *C. Project portfolio management tools and techniques* .  
<https://www.pmi.org/learning/library/project-portfolio-management-tools-techniques-1050>
- Ross, D. W., & Shaltry, P. E. (2006). The new PMI standard for portfolio management. Paper presented at the
- Saaty, T. L. (1989). Group decision making and the AHP. *The Analytic Hierarchy Process: Applications and Studies*, , 59-67.
- Salameh, H. (2014). A framework to establish a project management office. *European Journal of Business and Management*, 6(9), 19-26.
- Santos, V., & Varajão, J. (2015). PMO as a key ingredient of public sector projects' success—position paper. *Procedia Computer Science*, 64, 1190-1199.
- Schibi, O. (2013). Why PMOs do not deliver to their potential. Paper presented at the
- Serrador, P., & Turner, J. R. (2014). The relationship between project success and project efficiency. *Procedia-Social and Behavioral Sciences*, 119, 75-84.
- Standish Group. (2015). CHAOS report 2015. *The Standish Group International, Inc*, , 1-13.
- Staneva, D., Alexandrova, M., & Petkov, G. (2014). Local and Global Measures for Success and Reconstructive Determination of the Optimal Number of Partners in European Educational Projects. *Economic Alternatives*,
- Stentoft Arlbjörn, J., Freytag, P. V., & Thoms, L. (2015). Portfolio management of development projects in Danish municipalities. *International Journal of Public Sector Management*, 28(1), 11-28.
- Tahri, H., & Drissi-Kaitouni, O. (2015). New design for calculating project management maturity (PMM). *Procedia-Social and Behavioral Sciences*, 181, 171-177.
- Taylor, M. P., Mead, M. R., & Holloway, M. J. (2015). *Delivering Successful PMOs: How to Design and Deliver the Best Project Management Office for Your Business*. Ashgate Publishing, Ltd.
- Teller, J., Unger, B. N., Kock, A., & Gemünden, H. G. (2012a). Formalization of project portfolio management: The moderating role of project portfolio complexity. *International Journal of Project Management*, 30(5), 596-607.
- Teller, J., Unger, B. N., Kock, A., & Gemünden, H. G. (2012b). Formalization of project portfolio management: The moderating role of project portfolio complexity. *International Journal of Project Management*, 30(5), 596-607.
- Turner, J. R., Anbari, F., & Bredillet, C. (2013). Perspectives on research in project management: the nine schools. *Global Business Perspectives*, 1, 3-28.
- Unger, B. N., Gemünden, H. G., & Aubry, M. (2012). The three roles of a project portfolio management office: Their impact on portfolio management execution and success. *International Journal of Project Management*, 30(5), 608-620.
- Whitten, N. (2000). POWER PRACTICES Is Your PMO Respected? *Pm Network*, 14(4), 21-22.
- Zika-Viktorsson, A., Sundström, P., & Engwall, M. (2006). Project overload: An exploratory study of work and management in multi-project settings. *International Journal of Project Management*, 24(5), 385-394.