

Application Project Management Methodology in Construction Sector: Review

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Abstract— The main aim of this research is to introduce Project management Methodology (PMM) and assessment the applying some of the types of the PMM in the construction sector. There are two types of project methodology approach, firstly traditional approach and modern approach. Modern project management methodology content two major methodologies are PMBOK and PRINCE2, Both PMBOK and PRINCE2 focused on project management processes and would appear near it on the methodology matrix. Therefore a lot of studies about PMM, most of these studies addressed the methodology within the comprehensive general frame work and focused particularly on IT project. The objectives of these studied focused on the relationship of the methodology to successfully or failed projects, as well as lack of experiences and training, limited to the performance of contractors in IT project, and improve the effectiveness of project management methodology of construction project and the role of the project management office to raise awareness of the importance of project management methodology. Some studies used descriptive statistical methods and regression analysis, and do not used mathematical model. This research recommended when choosing any project management methodology, it is recommended that project teams look at the benefits of a good project management methodology, as well as select a project management methodology that is appropriate for their organizational size, the necessity of their software systems, and the requirements of their customer.

Index Terms— Project management Methodology, PMBOK, PRINCE2

1 INTRODUCTION

Project Management is the process of achieving project objectives (schedule, budget and performance) through a set of activities that start and end at certain points in time and produce quantifiable and qualifiable deliverables (1). A Project Management Methodology can be defined as: an application of knowledge, skills, tools and techniques to meet or exceed the project requirements. In other words, by using the correct methodology, a project manager can identify and minimize risks, costs and meet the project schedules. No PMM can be universally applied to manage all projects across the various sectors (2). Project management methodology is defined by Project Management Institute as set of methods, techniques, procedures, rules, templates, and best practices used on a project (3). Also; a Project management methodology is (4).

- a) Conceptual framework for the management of programs and projects.
- b) A collection of guidelines, standards and processes.

The researcher believed that the PMM is a developed tool to share and communicate lessons learned and best Practices for program and construction project management.

2 RESEARCH QUESTION

Only One question raised in this study is: which types of project management methodology can be applied and implemented in construction project in Iraq?

3 RESEARCH AIM

The main aim of this research is to introduce Project management Methodology (PMM) and assessment the applying some of the types of the PMM in the construction sector. This aim is to be justified through the following procedure.

- a) Exploring the applications of Project management Methodology (PMM) in construction engineering field.
- b) To identify the Elements of Successful Project Management in the construction sector.
- c) Determining the benefits and importance of the project management Methodology in construction project.
- d) To identify the basic process groups and ten knowledge areas in project management.
- e) Evaluating the performance of the International Methodologies through comparing the results of these methodologies with other traditional methods.
- f) To examine and comparison between previous studies and exploring the strong and weakness points for each study.

4 RESEARCH SIGNIFICANCE

The Significance of this research can be divided into three

parts. Firstly, provide immense value to the success of Iraqi construction sector. Secondly, introduce the Project Management Methodology to the construction project in general, and to compare it with the construction industry to see what advantages there may be. And, finally, the findings of this research could provide for academic researchers a source of reference.

5 ELEMENTS OF SUCCESSFUL PROJECT MANAGEMENT

There are a number of different elements that makes a project successful. These factors that lead to successful projects include: ⁽¹⁾

- a) Clearly defined goals and objectives.
- b) A well - defined project, management process.
- c) A Proven set of project management tools.
- d) Clearly understanding of the role of project management.

The project manager has a broad array of behavioral and management techniques from which to choose. The objective of the selection process is to choose techniques that ensure high-quality, on-time deliverables that are accepted by the business and that fit the conditions and environment.

6 KNOWLEDGE AREA OF PROJECT MANAGEMENT

Project Management is the use of knowledge, skills, tools and techniques to project activities in order to better facilitate stakeholder expectations.

Included in the project phases are nine knowledge areas. The knowledge areas are integrated in all phases throughout the project. These tools enable the Project Manger to ensure all projects are conducted in the most organized, efficient manner. They are ⁽¹⁾:

a) Scope Management

Includes the processes required to ensure that the project includes all the required work, without additional and unnecessary work, to complete the project successfully.

b) Communications Management

Includes the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information.

c) Risk Management

It is the systematic process of identifying, analyzing, and responding to the project task.

d) Human Resource Management

Includes the processes required to make the most effective use of the people involved in the project.

e) Procurement Management

Includes the processes required to acquire the goods and services to attain project scope from outside the performing organization.

f) Time Management

Includes the processes required to ensure timely completion of the project.

g) Cost Management

Includes the processes required to ensure that the project is completed within the approved budget.

h) Quality Management

Includes the process required to ensure that the project will satisfy the needs for which it was undertaken.

i) Integration Management

Includes the processes required to ensure that various elements of the project are properly coordinated.

j) Stakeholder Management

Includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project ⁽⁶⁾.

7 PROJECT MANAGEMENT LIFE CYCLE

All projects follow the same project management life cycle, from Initiation through Closure. It is during the life cycle of any project that proven and tested project management processes or best practices are applied by successful project managers. The types and extent of processes implemented depends on the nature of the project, i.e. size, probability of failure and consequences of failure to the organization or program that the project is supporting. Effective leaders implement an infrastructure for success, discipline that will help insure that the organization is protected. Every project follows the same project life cycle ⁽¹⁾ was content (Initiation, Planning, Execution, Pre-Construction, Construction, Post Construction, Control and Closure).

8 BENEFITS OF PROJECT MANAGEMENT METHODOLOGY

Reviewing the literature supporting these project management methodologies, it is clear that methodologies have been created to specifically address the needs of certain industries, whether information technology, construction, financial, or governmental. The common denominator for all project management methodologies regardless of the industry is that a thorough analysis of the necessary output, product, service, or system is identified in the beginning stages of the project. Next, a team focuses on creating a quality improvement to replace or introduce to the organization or customer. Lastly, documentation of processes and implementations are recorded so that future advances can be made easily and current outputs (whether products or systems) can be kept current. These factors are components of all the project management methodologies that have been discussed. Can be summarized the benefits of a Good Project Management Methodology ⁽⁶⁾

- k) Clear agreement on the project objectives;
- l) Ease of handling and distribution of project reports;
- m) Easy to review the project, according to its objectives;
- n) The transparency in project management practices;

- o) Success in project risk management;
- p) Handling the problems, and the complexities of the project;
- q) Easy to measure completion percentage, and to improve control and command of the project;
- r) Regulating the inventories of stakeholders in various phases of the project;
- s) Measurement of accomplishment against plans;
- t) Improved estimating probability for future planning; and
- u) Knowing when objectives cannot be met or will be exceeded.

- f) Installation
- g) Maintenance

The project can only move to the next phase once the previous one has been completed and verified. This method is preferable for projects in which the outputs are physical objects (such as construction projects, hardware installation projects, etc.), as well as the projects in which tasks need to be completed in a specific sequence. Also, the project plans are re-usable for other projects in the future.

9 TYPES OF INTERNATIONAL METHODOLOGIES

Below is a brief overview of different types of project management methodologies. Though by no means comprehensive, the list is designed to give owners or project managers a sense of some of the options open to them when developing their projects. Fig.1 shows a few of the project management methodologies popular today. Some methodologies can be used for all types of projects. Others are suitable only for specific project types. For example, one methodology would be used for a road construction project and a different methodology would be more suitable for a software development project. The most frequently used methodologies will be discussed below. The researcher believed there is no "best" methodology; the choice depends on the type of the project and specific circumstances.

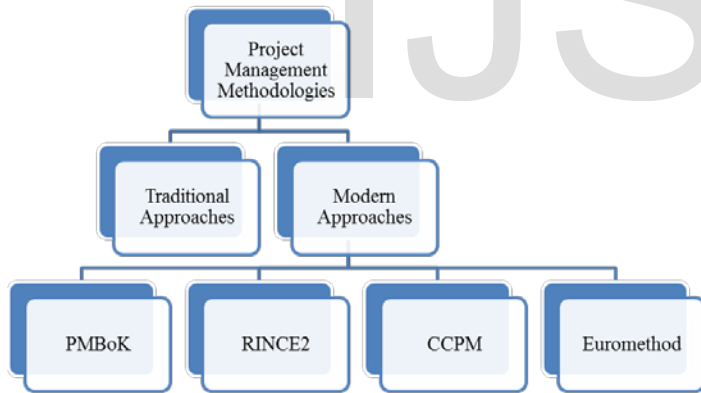


Fig.1. Project management methodologies popular today

9.1 Traditional Approaches

This traditional methodology (Waterfall) can be used across all industries, but it is the most common in the construction industry. It is also called the Waterfall Model, because it defines the sequence of phases to be completed, which resembles a waterfall. This methodology divides the project management process into 7 consecutive phases:

- a) Requirements specification
- b) Design
- c) Construction (coding)
- d) Integration
- e) Validation (testing)

9.2 Modern Approaches

Modern methodologies do not focus on linear processes, but they provide an alternative look at project management. Some of the methods are best for IT and software development, while others can be implemented in production, process improvement, product engineering, and so on. Modern PM approaches use different models of the management process. It is the matter of a project's type, size and nature to select the right methodology. Here are the most popular PM methodologies:

- a) PMBoK (Project Management, Body of Knowledge) is a set of standards and solutions concerning project management, collected and published by members of PMI (Project Management Institute). The PMBoK Standard is a set of well-known and accepted procedures applied in project management. In the USA, PMBoK has been approved by the American National Standards Institute as national standards of project management ⁽⁷⁾.
- b) RINCE2 (Projects in a Controlled Environment) includes method of project management based on experience of project managers from the Anglo-Saxon countries. It can be applied for the management and control of any kinds of projects ⁽⁷⁾.
- c) CCPM (Critical Chain Project Management) is the way to plan, implement and review the various kinds of work in single- and multi-project environments. This management methodology uses *Theory of Constraints* (TOC) and the *concept of buffers* to establish improved task durations and manage resource-dependent tasks and activities ⁽⁸⁾.
- d) Euromethod. The development of this methodology as a result of mutual understanding between customers and providers of information technology services within the EU countries, and in July 1996, was published the second version of the marketed outside the European Union (EU), which is now marketed under the name of (Information Services Procurement Library).

This methodology aims to improve operations and projects to facilitate contracting and tendering processes in addition to the success of the development and improvement of operations processes within organizations ⁽⁹⁾. The researcher recommending when choosing any project management methodology, it is recommended that project teams look at the benefits of a good project management methodology, as well as select a project management methodology that is appropriate for their organizational size, the necessity of

their software systems, and the requirements of their customer. Also, Project management methodologies would be only continued to develop in the global marketplace. Thus, it is imperative that project managers have a thorough understanding of the needs of their clients, their current processes, and the techniques that can assist them in improving their processes for competitive advantage in today's world.

10 PMP AND PRINC2

It is believed that there is a range of reasons leading to the use of international project management methodologies. The most important of these reasons include:

- a) Increasing the efficient at implementing construction projects
- b) Improves the maturity of project management processes
- c) Develops for new and existing contracting company (or re-organization)

The researcher could be provides examine the similarities and differences between the PMBOK approach and PRINCE2 method. Also, how PRINCE2 integrated with PMBOK, and how PRINC2 provides added value to a PMBOK® Guide knowledge base, as shown in Table.1.

Table.1. Showing the Major Comparative Points

No.	Major Points	PMBOK® Guide	PRINCE2®
1	Approach to PM	Largely Descriptive	Quite Prescriptive - especially for Process interactions, but scalable
2	Project Initiation	Customer centric - Project Charter	Business Case driven
3	Empowerment for the Project Manager (PM)	Need to consider Sponsor/Key stakeholders	Project Ownership and Control by Senior Management above PM (Project Board/Executive)
4	Adaptation/ Tailoring to specific Projects	Is left to the PM- some Processes can be left out if needed	All Processes need to be considered - but can be scaled - to meet Project specific requirements
5	Controls/Checkpoints	Are left to the PM to decide	Multi level controls clearly laid out for progress reporting and tracking at various levels

PMBOK methodology was content of five project management process groups such as (initiation, planning, executing, controlling and closing). Also, PRINCE2 consist of five project management stages groups such as (initiation, planning or design, execution or production, monitoring and controlling, and project completion) as shown in Fig.2.

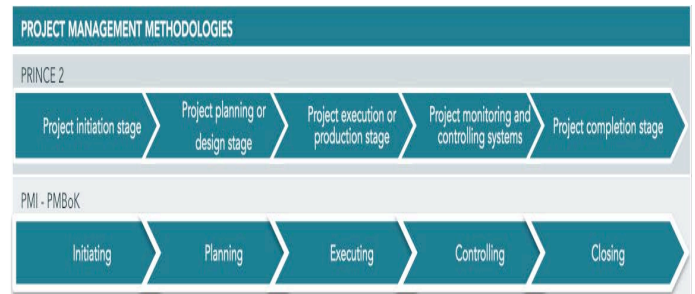


Fig.2. Project Management Process Groups in PMBOK and PRINCE2

Both PMBOK and PRINCE2 focused on project management processes and would appear near it on the methodology matrix. The following fig.3 illustrates the similarities between the two methodologies.

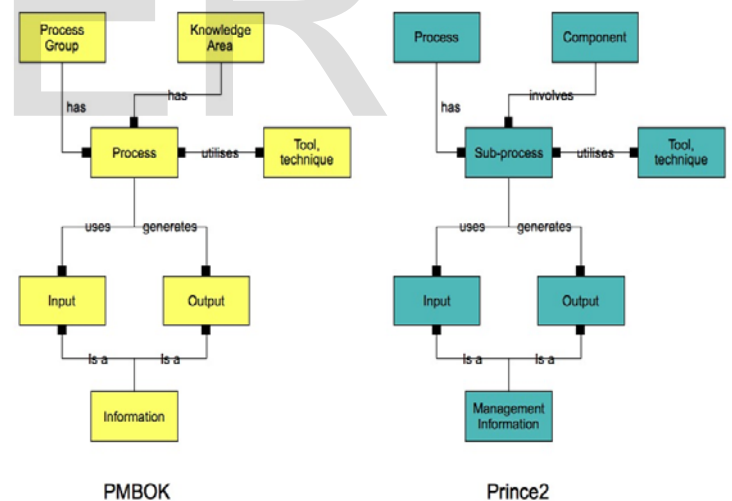


Fig.3. Similarities between the two methodologies PMBOK and PRINCE2

Laterally, the researcher reached the following conclusions:

- a) The PRINCE2 and PMBOK are complementary,
- b) PMBOK provides the knowledge and PRINCE2 the how-to
- c) There is both a good foundation for "doing projects"

- right”
- d) They both provide an internationally proven approach to implementing projects.
 - e) Are both built on a family of “Best Practices”.

11 PREVIOUS STUDIES

The previous studies provide a basis for further research on the application of different project management approaches and methodologies, where further research could build on an idea of creating a unique methodology for the project, based on different project management approaches. In that way, it is possible to create project management methodologies that have a high possibility of customization for projects. The following is the most important studies that have been obtained through the tracking and research in books and online libraries and some universities.

a) AL- KHOURI, 2007 (A Methodology for Managing Large-Scale IT Projects) ⁽¹⁰⁾

The methodology was mainly tested in the United Arab Emirates (UAE) and was followed in three GCC countries. The research demonstrated that by following a formal, structured methodology, governments will have better visibility and control over such programs. The implementation revealed that the phases and processes of the proposed methodology supported the overall management, planning, control over the project activities, promoted effective communication, improved scope and risk management, and ensured quality deliverables. The study revealed that the most important contributions resulting from the application of the methodology to the project are as following:

- 1) Agreed and articulated project goals and objectives.
- 2) Supports project and management status reporting.
- 3) Improved project control – evaluate and measure performance based on the defined scope, schedule, budget, quality of deliverables.
- 4) Regular reviews of progress against plan.
- 5) Success in risk management and handled project complexity.

The study recommended using the processes of project management methodology at various project activities to its impact in improving the overall visibility and control of the project activities, promoted effective communication, supported scope and risk management, and ensured quality deliverables.

b) Bassam Hassan, Jamal Omran, Rana Mia, 2008 (Methodology of Project Management Assessment and the Financial Effects of Its Practices) ⁽¹¹⁾

The study was conducted in Syria and aims to evaluate the maturity of project management methodology in construction compared to the performance of the project in terms of time and cost. The study has been developing a methodology to assess the maturity of project management processes applicable in the Syrian project, then applied regression analysis to find the correlation between project management maturity and project performance, represented by

cost and duration deviation coefficient. The researcher said that the application of this research does not depend on a specific type of projects; it can be applied to all types of construction projects. It is demonstrated that there is a positive correlation between the maturity of project management processes and overall performance of the project, through design a simple questionnaire appropriate for the application. The results of the study have been achieved were developed model based on the model of Schlitz with some modifications by integrating and adding some elements. It was demonstrated the validity of this model through the confirmation of the link between the maturity of project management processes and the cost and time deviation coefficient of the projects studied. The study recommended the importance of investing in skills development and new tools and methodologies in project management.

c) Patah & de Carvalho, 2009 (The value of project management methodology: a case study) ⁽⁶⁾

The study was conducted in Brazil, and presents how to try to measure the value of project management. The methodological option adopted was a survey conducted with companies that are supposed to have good methodologies in project management in the IT Brazilian market. For these companies a survey was conducted through the use of the OPM3 maturity model from the PMI analyzing their project management methodology. The study stated some benefits of the project management methodology

- 1) Higher productivity, improvement in the sales growth, improvement in the customer satisfaction, higher market share, better customer retention.
- 2) Higher employee satisfaction and employee productivity, lower employee turnover and optimized training time.
- 3) Adequate time to market and project completion, decreasing number of process errors and scope changes.

The study realized that it is important to have a structured project management methodology, and though the analysis of the value creation through the PM methodology, it is possible to confirm that it is supported for the existed theory. It was possible to prove that the spend of the company's money in project management gave them an opportunity to gain more money, reduce costs and manage effectively their projects, and it is special true for the companies from the IT market.

d) Jan De Messemaeker, 2010 (Adoption of structured project management methodologies: a project manager's gain) ⁽¹²⁾

The study was conducted in Belgium. The main goal of this paper is to initiate research on the assumption that structured project management methodologies are more efficient than other more basic methods. The research creates two distinct groups by using the terms “without training” for project managers who don't use internationally-recognized structured methodologies and “trained” or “certified” for those who do. The research focuses on PRINCE2 and PMBoK as they are the two major interna-

tionally-recognized methodologies. It is concluded that untrained project managers will be less able to stay on schedule and within their budget, while achieving the required quality levels, compared to certified project managers. The study recommends the recognized global methodologies such as the methodology of the American project management Institute PMI or British methodology of project management, and ensures the project managers holding the adoption of international project management.

e) Mc Hugh & Hogan, 2010 (Investigating rationale for adopting an internationally recognized project management methodology in Ireland) ⁽¹³⁾

The study was conducted in Ireland. It reported that many of the organizations have become more dependent on technology with the importance of the existence of an effective management to manage project in order to end the project required on time, quality and within budget. The study recommends organizations and companies to have an internationally recognized methodology because of its benefits in raising the efficiency of organizations and good communication with stakeholders, as recommends by the need to address plans and training support to the project team.

f) Chin & Spowage, 2010 (Defining & Classifying Project Management Methodologies) ⁽¹⁵⁾

PMM is classified into two major categories with five distinct. The two categories are project management methodologies (that provide a high – level framework for the project) and application development methodologies (which provide details on project design and development). The most apparent difference being that application development methodologies have a stronger focus on system testing, which is not covered in PMM. The confusion within the published literature and by project practitioners as to what constitutes a methodology is understandable as opinions vary widely. As a consequence, it is classified PMM into five different levels; L1-Best practices, standards and guidelines; L2- Sector specific methodology; L3-Organization specific customized methodology; L4-Project specific methodology and L5-Individualized methodology.

g) Shai Rozenes, 2011, (The Impact of Project Management Methodologies on Project Performance) ⁽¹⁵⁾

The study aimed to know the impact of the application of project management methodology on the performance of projects, the study also focused on the academic and training programs for project management. The study was conducted by the survey among both academics and practitioners of project management on the appropriate structure of the methodology that reduces the likelihood of project failure, and the question was: Did the project management methodology improve the effectiveness of project performance? This study found that the use of project management methodology increased the chance of success of the project by a large margin increased as the value-added of the organization due to the use of project management methodology. The study recommended an increase in academic and training programs, especially for project managers and the team work on the project.

h) Chin & Spowage 2012, (Project Management Methodologies: A Comparative Analysis) ⁽¹⁶⁾

The study was conducted in Malaysia, the objective of the paper was to compare and discuss specific customized PMM across three sectors to elicit a common set of requirements. The study clarified that the methodology must be flexible; yet it should provide guidelines which leverage on both best practices and past experiences to ensure the project goals are achieved, and it is impractical to develop a new methodology for each new project within the organization. It was found that all of the PMM established could be applied to all types of projects inclusive of IT projects, and most methodologies consisted of unique project phases and processes. The study recommended that PMM should be scalable and adaptable to project sizes, and should leverage on the best practices of the specific environment / discipline to minimize obstacles and failure rate. It also should facilitate the clarification of goals and the scope of the project by incorporating the best practices of all project management group processes.

i) Gaber Yousef, 2012, (Assessing using Project Management Methodology in Managing Construction Projects in Saudi Arabia) ⁽⁹⁾

The study aimed to clarify the reality of using project management methodology and its relationship to construction projects in Saudi Arabia, because of its great importance in providing solutions that can help in organizing this large sector so as to ensure the implementation of projects on the basis of unified and clear procedures. The study included data collected through a questionnaire which was designed to sample from the engineering offices and contracting companies as a tool to measure the study hypothesis. The study found statistically significant for each of ; the absence of the availability of scientific and administrative leaders, the absence of the role of project management office, in addition to the absence of awareness of the importance of project management as a competitive advantage over non-successful implementation of project management methodology in constructional projects. The study recommended the need to develop scientific and practical methodologies and adopting a professional organizing approach and using global best practices in project management and using accurate indicators (technical and financial) to measure the level of the quality of the projects.

j) Mario Špundaka 2014, (Mixed agile / traditional project management methodology – reality or illusion?) ⁽¹⁷⁾

The study was conducted in Croatia; it provided an overview of different project management approaches and defined project management methodologies. It aimed to clarify whether it was possible to combine both traditional and agile project management approaches in a single project management methodology. It had been shown that there is no silver bullet for using a project management approach and project management methodology for a specific project. Both traditional and agile approaches have their advantages and disadvantages, if compared to different project characteristics.

k) Al-Zwainy et al 2016, (Investigation and assessment of the Project Management Methodology in Iraqi Construction Sector)^[18]

The aim of this study is investigation the impact of the application of project management methodologies in Iraqi construction sector. The importance of this study as new add for the fields of knowledge, it can be benefit for researchers in academic field and engineers in the practical field. The questionnaire form was designed by following a simple method, because the questionnaire as an important source of acquiring field information and data. The Iraqi Ministry of Construction and Housing and Public Municipalities was selected as a study population. The questionnaire content three axes. The first axis: (Personal data and information), The second axis :(assess the application of Project Management Methodology in Iraqi construction sector), and The third axis: (The reasons for the lack of application of international methodologies in the Iraqi project management), one of important of result this study is the main reason for the absence of a project management methodology in the company is lack of conviction and lack of interest of top management in project management methodology. Twenty five variables or reasons which effect on the PMM are presented. The highest ranked factor variables for factors influencing is V19 with relative importance (RI) of 77% first (1st), V1 was ranked second (2nd) with RI of 75%, V20 was ranked third (3rd) with RI of 72% and others variables have relative importance from 60-69% (Very Important).

12 SUMMARY

In this study, the researcher highlighted the importance of the project management methodology as a contemporary and modern science in Iraqi construction sector, and exploring the international project management methodology and comparison between them as shown in Appendic A. Also, the researcher can be summaries importance results from previous studies as shown in fig.4.

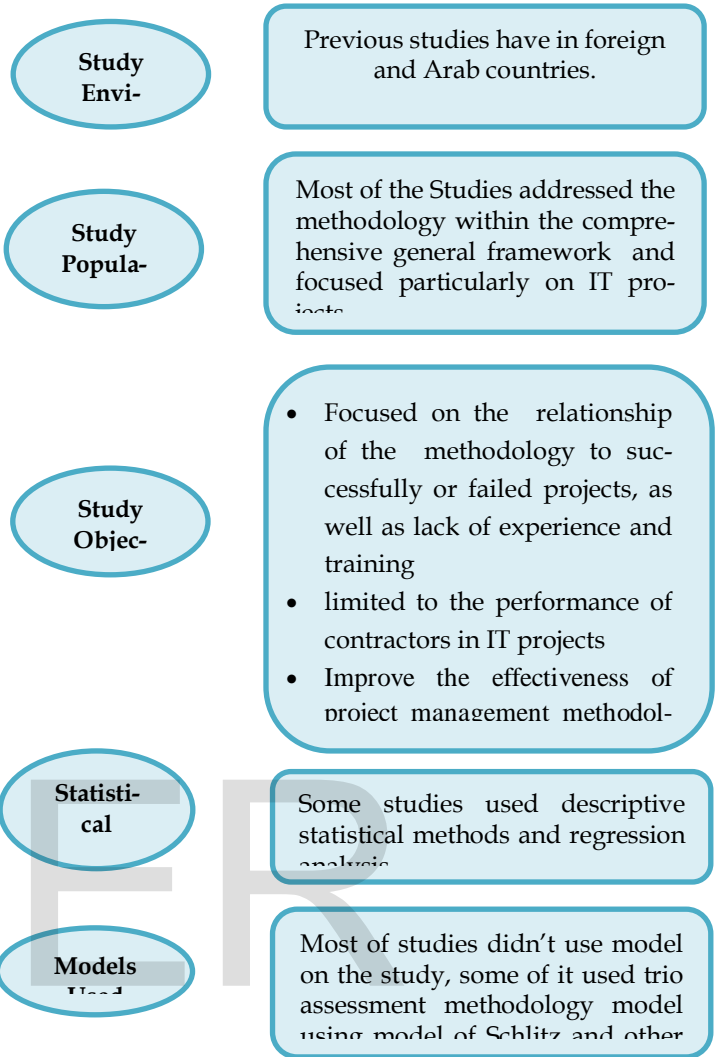


Fig.4. The differences between previous studies and current study.

REFERENCES

- [1] Project Management Methodology Guidelines, "Project Management Methodology & Step-by-Step Guide to Managing Successful Projects", Arizona: City of Chandler, 2010.
- [2] Whitaker, S., "The Benefits of Tailoring: Making a Project Management Methodology Fit", Newtown Square, PA: Project management institute, 2014.
- [3] Project Management Institute. "A Guide to the Project Management Body of Knowledge". Fourth Edition (PMBOK Guide). Newtown Square, PE: Project Management Institute, 2008.
- [4] ITS Project Management Group, "ITS Project Management Methodology" UC SANTA CRUZ, 2014.
- [5] Project Management Institute. "A Guide to the Project Management Body of Knowledge". Fifth Edition (PMBOK Guide). Newtown Square, PE: Project Management Institute, 2013.
- [6] Patah, L.A. and de Carvalho, M.M., "The value of pro-

- ject management methodology: a case study", University of São Paulo, Product: Management & Development, Vol. 7 No.2, 2009.
- [7] Victorian Government CIO Council, "Selecting a project management methodology", Victorian Government Chief Technology Advocate, 2013.
- [8] Eric McConnell, "Project Management Methodology: Definition, Types, Examples", 2010, web. <http://www.mymanagementguide.com/basics/project-methodology-definition/>.
- [9] Yousef, G., AL Samaraie, S., "Assessing using Project Management Methodology in Managing Construction Projects in Saudi Arabia", Arab Academy in Denmark, College of Business and Economics, 2012. (Arabic).
- [10] Al-Khoury, A.M., " A Methodology for Managing Large-Scale IT Projects", Warwick University, 2007.
- [11] Bassam, H., Jamal, O. and Rana, M., "Methodology of Project Management Assessment and the Financial Effects of Its Practices", Tishreen University, Engineering Sciences Series Vol. (30) No. (1), 2008.
- [12] Messemaeker, J., "Adoption of structured project management methodologies: a project manager's gain?", Vrije Universiteit Brussel, 2010.
- [13] Mc Hugh, O. And Hogan, M., "Investigating the rationale for adopting an internationally-recognised project management methodology in Ireland: The view of the project manager", International Journal of Project management, Elsevier, Vol.1.No. 1240.pp.10, 2010.
- [14] Chin, C.M.M. & Spowage, A.C., "Defining & Classifying Project Management Methodologies" PM World Today, Vol.7, No.5, 2010.
- [15] Rozenes, Sh., "The Impact of Project Management Methodologies on Project Performance", Ruppin Academic Center, International Journal of Information Technology Project Management, Vol.2, No.2, pp. 64-73, 2011.
- [16] Chin, C.M.M. & Spowage, A.C., "Project Management Methodologies: A Comparative Analysis" Journal for the Advancement of Performance Information and Value VOL. 4 NO. 1, 2012.
- [17] Mario, Š., "Mixed agile / traditional project management methodology - reality or illusion?", Procedia social and behavioral Sciences, Vol.119, PP.939-948, 2014.
- [18] Al-Zwainy F. m. S., Ibrahim A. Mohammed and Saja H. Raheem, " Investigation and assessment of the Project Management Methodology in Iraqi Construction Sector ", International Journal of Applied Engineering Research, Vol. 11, No. 4, pp 2494-2507, 2016

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APPENDIC A

Study	Year	Country	Study Objective	Statistical Method	Models Used
A Methodology for Managing Large-Scale IT Projects	2007	United Arab Emirates (UAE)	Presents a project management methodology to support the management and control of the project	None	None
<p>Conclusions: add value to the knowledge currently available to practitioners and recognizes the value of formal project management and introduces a tested methodology to more effective management of such initiatives. Project management was found crucial to exist in such large scale and complex projects where attention was required to analyse and carefully respond to the implications of the slightest change.</p>					
Methodology of Project Management Assessment and the Financial Effects of Its Practices	2008	Syria	Evaluates the maturity of project management methodology in construction compared to the performance of the project in terms of time and cost.	Regression Analysis	Developed a model assessment methodology
<p>Conclusions: There is a positive correlation between the maturity of project management processes and overall performance of the project. The study has been developing a methodology to assess the maturity of project management processes applicable in the Syrian project,</p>					
The value of project management methodology: a case study	2009	Brazil	Presents how to try to measure the value of project management in the Brazil	None	None
<p>Conclusions: Though the analysis of the value creation through the PM methodology, it was prove that spend the company's money in project management gave them an opportunity to gain more money, reduce costs and manage effectively their projects, and it is special true for the companies from the IT market.</p>					
Adoption of structured project management :methodologies a project manager's gain?	2010	Belgium	The main is to initiate research on the assumption that structured project management methodologies are more efficient than other, more basic methods	None	None
<p>Conclusions: Untrained project managers will be less able to stay on schedule and within their budget, while achieving the required quality levels, compared to certified project managers</p>					

Investigating the rational for adopting an internationally recognized project management methodology in Ireland	2010	Ireland	Examines why organizations with an existing project management methodology are transitioning to an internationally-recognized methodology, and why organisations that do not have a project management methodology are implementing an internationally-recognized methodology	None	None
Conclusions: The Results of five case studies; suggest that while an in-house project management methodology can work well within an organization, the benefits of using an internationally-recognized methodology should be considered.					
Defining & Classifying Project Management Methodologies	2010	Malaysia	Applying project management methodologies (PMM) to improve the probability of meeting the project goals.	None	None
Conclusions: The methodology must be flexible, yet it should provide guidelines which leverage on both best practices and past experiences to ensure the project goals are achieved. It is impractical to develop a .new methodology for each new project within an organization					
The Impact of Project Management Methodologies on Project Performance	2011	Israel	It aimed to know the impact of the application of project management methodology on the performance of projects	None	None
Conclusions: It is found that the use of project management methodology increased the chance of success of the project by a large margin increased					
Project Management Methodologies: A Comparative Analysis	2012	Malaysia	Compare and discuss specific customized PMM across three sectors to elicit a common set of requirements	None	None
Conclusions: All of the PMM established could be applied to all types of projects inclusive of IT projects, and most methodologies consisted of unique project phases and processes					
Assessing using Project Management Methodology in Managing Construction Projects in Saudi Arabia	2012	Saudi Arabia	Clarify the reality of using project management methodology and its relationship to construction projects in Saudi Arabia	Descriptive statistical methods	None
Conclusions: The study found statistically significant for the absence of the availability of scientific and administrative leaders, the absence of the role of project management office, in addition to the absence of awareness of the importance of project management as a competitive advantage over non-successful implementation of project management methodology in constructional projects					
Mixed agile/traditional project management methodology – reality or illusion?	2014	Croatia	Clarify whether it is possible to combine both traditional and agile project management approach in a single project management methodology	None	None
Conclusions: Both traditional and agile approaches have their advantages and disadvantages, if compared to different project characteristics					