



The Role of Project Portfolio Management in Fostering Innovation Within the Context of UAE's Organizations

**دور ادارة محفظة المشاريع فى تعزيز الابتكار ضمن سياق منظمات
دولة الامارات العربية المتحدة**

by

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of the requirements for the degree of
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Abstract

The research study is conducted with an aim to determine the ways through which large portfolio organizations of UAE can be able to foster innovation by adopting practices of Project Portfolio Management.

On the basis of the literature review, the theoretical framework was developed and identified 6 variables that may influence the PPM towards innovation. In the data analysis section, the relationship of variables has been determined with the PPM success and innovation. A total of 6 hypotheses have been framed on the basis of the conceptual model of the study.

Quantitative Research approach is applied in the research and for the prepared questionnaire, the data were collected from 219 respondents of the large organizations of UAE, the data analysis and hypotheses' testing was performed with the help of SPSS. On the basis of the correlation analysis, the relationship between the variables of the study has been interpreted.

Report analysis findings indicate various factors that positively affect the success of the project portfolio management in fostering innovation. These are; the project portfolio manager's engagement, organizational culture, involvement of senior managers, changing external environment, governance in the PPM and availability of the resources.

As for this research study, it was able to identify that the project portfolio management practices are essential in fostering innovation within UAE's organizations.

ملخص البحث

أجريت هذه الدراسة بهدف تحديد الوسائل التي يمكن من خلالها للمؤسسات الكبيرة في دولة الإمارات العربية المتحدة أن تعزز الابتكار في عملياتها من خلال تبني ممارسات إدارة محفظة المشاريع.

إستنادا إلى الدراسات السابقة التي تناولت الموضوع ذاته، تم تطوير الإطار النظري وتحديد ٦ عوامل/متغيرات والتي قد يكون لها تأثير علي آلية إدارة الأداء لمحفظة إدارة المشاريع نحو الابتكار. وفي الجزء المخصص لتحليل البيانات تم تحديد العلاقة ما بين المتغيرات ونجاح محفظة إدارة المشاريع والابتكار. وقد تم تشكيل ٦ فرضيات علي أساس النموذج المفاهيمي للدراسة.

لقد تم تطبيق منهج البحث الكمي في هذه الدراسة البحثية، ولإعداد الإستبيان الإستطلاعي تم جمع البيانات من ٢١٩ مشاركا من الشركات الكبيرة في دولة الإمارات العربية المتحدة، ولقد تم تحليل البيانات وعمل إختبارات الفرضيات من خلال برنامج spss المختص بتحليل البيانات. وتم تفسير العلاقة بين متغيرات الدراسة علي أساس تحليل الارتباط.

تلخصت نتائج تحليل البيانات إلي وجود عوامل مختلفة تؤثر بشكل إيجابي علي نجاح إدارة حافظة المشاريع في تعزيز الابتكار، وهي مشاركة مديرحافظة المشاريع، الثقافة التنظيمية للشركة، إشراك كبار المديرين في القرارات، تغيرات البيئة الخارجية، الحوكمة في إدارة حافظة المشاريع وتوافر الموارد.

خلاصة هذه الدراسة البحثية أن ممارسات إدارة حافظة المشاريع ضرورية لتعزيز الابتكار داخل شركات ومؤسسات دولة الإمارات العربية المتحدة.

Dedication:

I dedicate this Masters thesis to the soul of my beloved Father “my first teacher & supporter” who have made every effort to show me the important value that education holds, and would like to express my deepest love to my Mother for her continuous prayers as well as my dearest Sisters and Brothers for encouraging me to achieve my goals.

Additionally, I wish to devote my work to my Wife and Kids, the light and love of my life, who gave me all the strength, love and support I needed to overcome the challenges in accomplishing my work. Without them none of this would have been possible.

I also express my deepest thanks to my supervisors and to all BUiD family members who provided me the possibility to complete this dissertation.

Khaled M. Hannoush

إهداء

أخصص هذه الرسالة لدرجة الماجستير لروح والدي الحبيب "مدرسي ومؤيدي الأول" الذي بذل كل جهد ممكن لإظهار القيمة الهامة التي يحملها التعليم، وأود أن أعرب عن أعمق حبي لأمي لصلواتها الدائمة لي كذلك هم أخواتي وأخواني الأحباء لتشجيعهم المستمر لي لتحقيق هدافي.

بالإضافة الي ذلك، أود أن أكرس عملي هذا لزوجتي وأطفالي والذين هم ضوء وحب حياتي، الذين منحوني كل القوة والدعم اللازم للتغلب علي التحديات في إنجاز هذا العمل، وبدونهم لم يكن أي من هذا ممكنا.

كما أعرب عن عميق شكري وإمتناني للمشرفين علي رسالتي هذه ولجميع العاملين في الجامعة البريطانية في دبي الذين قدموا لي الفرصة والدعم اللازم لإستكمال هذه الدراسة.

م. خالد محمود هنوش

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Chapter 1: Introduction

The dissertation emphasizes on the role of Project Portfolio Management in fostering the innovation. Through the help of project, importance of the Project Portfolio Management is identified. Role of portfolio managers is crucial in the portfolio management. The ultimate aim of the project portfolio management is to facilitate the effective management of the organization. It is different from that of project management and yields better results. It is helpful in assisting the portfolio managers in combating the challenges of the portfolio management at portfolio level. Project portfolio management is regarded as one of the best practice providing aid in fostering innovation. This introductory chapter is exploring the concept of portfolio management. First of all, it is necessary to comprehend all the definitions to be used in the project (Doloi & Baradari, 2013)

Portfolio and project portfolio management are two most important definitions, defined as follows:

1.1 Portfolio

A portfolio is a collection of programs or projects, and other work that is grouped together for the purpose of facilitating effective management of that work. It is so done with the intention of meeting the strategic objectives of business (Doloi & Baradari, 2013).

1.2 Project portfolio management

The project portfolio management is the centralized management of the one or more than one portfolio. Project portfolio management includes identification, prioritization, authorization, and management of the projects, programs and other correlated work. In addition to that, controlling

of projects, programs and other related work is included in it. Aim of doing all this is to be able to achieve the strategic business objectives.

According to (Doloi & Baradari, 2013), there is difference between the project management and project portfolio management. Project management is mainly concerned with doing the project right. On the flip side, doing right projects is pertaining to the project portfolio management.

1.3 Importance of Project Portfolio Management in organizations of UAE

Project portfolio management (PPM) is a very effective tool for allocation of the resources. Since, focus of the portfolio project management is on the doing right projects, it is helpful in selecting those projects which are having high potential. PPM has emerged as the best innovation management practice. It is one of the most important management functions for the highly developed economy of the United Arab Emirates. Through using PPM, organizations of UAE can able to combat with the highly competitive environment and to develop competitive advantage simultaneously (Levin & Wyzalek, 2015)

PPM is best innovative tool for the companies operating in the environment of competition. PPM practices are providing succour to the organizations in efficient evaluation and analysis of the potential projects for investigating the value creation. PPM tools are preferred by the organizations for innovation of the product, which in lieu allow the organizations in optimization of resources and research and development activities. This way, PPM proves to be helpful in the creation of value for the customers (Levin & Wyzalek, 2015)

1.4 Roles and responsibilities of portfolio manager

Roles and responsibilities of the project portfolio managers are pertaining to the monitoring and managing of assigned portfolios. It is done in the following manner:

- In a bid to ensure the alignment with the organizational strategy manager has to guide and establish the selection, prioritization, balancing and termination processes for the components of portfolio.
- Portfolio managers have to keep stakeholders abreast of the performance of components and to offer them with the timely assessment of portfolio.
- Portfolio managers have to assist the decision makers in reviewing, reprioritization and optimization of the portfolio.
- It is a duty of the portfolio managers to keep stakeholders informed regarding the progress, impacts, and changes in relation to management of portfolio.
- Portfolio managers have to take part in the programs and review of the project for exhibiting the senior level support, leadership and involvement in the crucial matters (Léger & Swaminathan, 2016).

According to (Morris, 2010). Innovation portfolio management process includes five steps to be undertaken by the portfolio managers. These are some of the basic roles and responsibilities of the portfolio manager. Roles and responsibilities related to innovation supporting and exporting are mentioned below:

Step 1: Modeling the key strategic factors of the industry

First step in innovation portfolio management is to determine the key strategic factors of the industry, executed through the portfolio manager.

Step 2: Defining characteristics to be considered

Portfolio managers define the characteristics or criterion to be considered for the innovation. Here, Probability of technical success and commercial success is examined.

Step 3: Defining weighting and scoring of the attractiveness

Weighting can be given on the basis of the strategic factors such as rate of change, innovation strength of competitors and appetite for risk.

Step 4: Assessment of risk reward

Making risk and reward matrix does it. It is 2X2 matrix helping the portfolio manager in reducing the risk.

Step 5: Assessing proposed new projects

At this step, investments of the new proposed projects are examined.

1.5 Major challenges of portfolio management faced by the managers at portfolio level

Portfolio managers have to face the challenges of the portfolio management at the portfolio level rather than at the project level. Frequently faced challenges by the project managers as illustrated by (Kissi et al., 2013) are as follows:

- **Too many projects at once:** handling so many projects at the same time make it difficult for the portfolio managers to pay heed to the projects. Handling and managing multiple projects simultaneously creates unnecessary burden on the individual portfolio manager. It results in lack of concentration and consequent fails to deliver the best projects.
- **Misallocation of the resources:** lack of resources or sharing the same resources might be problematic for the managers handling portfolio projects. Misallocation of resources is evidenced specifically when managers are handling more than one project at the same time. It results in over allocation or under allocation the resources and tools. It hampers the performance of team and creates obstacles in delivering the results.

- **In house politics:** portfolio managers have to face in house politics. It deters the adoption of innovative strategies in the organizations. In addition to that implementing new technology or strategy becomes difficult with the resistance of the employees and makes it hard for the managers to handle project portfolio in an effective manner.

All the above-mentioned challenges are creating stumbling block in the path of fostering innovation. (Kissi et al., 2013)

1.6 Specific issue

Portfolio management is a strategic approach offering the practical compilation of expertise for the purpose of helping executives and operations & portfolio managers in program, and portfolio. It documents standards of the professional bodies. It has evolved drastically in the current scenario for increasing capabilities of the organization. In addition to that, it is helpful in guiding the on-going development and implementation of the robust capabilities. PPM has helped the organizations in identification of the potential fragilities. Some of the potential fragilities include emergence of the success trap inhibiting the innovation in an organization and difficulties of reallocation of resources (Killen & Hunt, 2013).

Portfolio management is required for the success of businesses for the following purpose "As illustrated in figure-1 below":

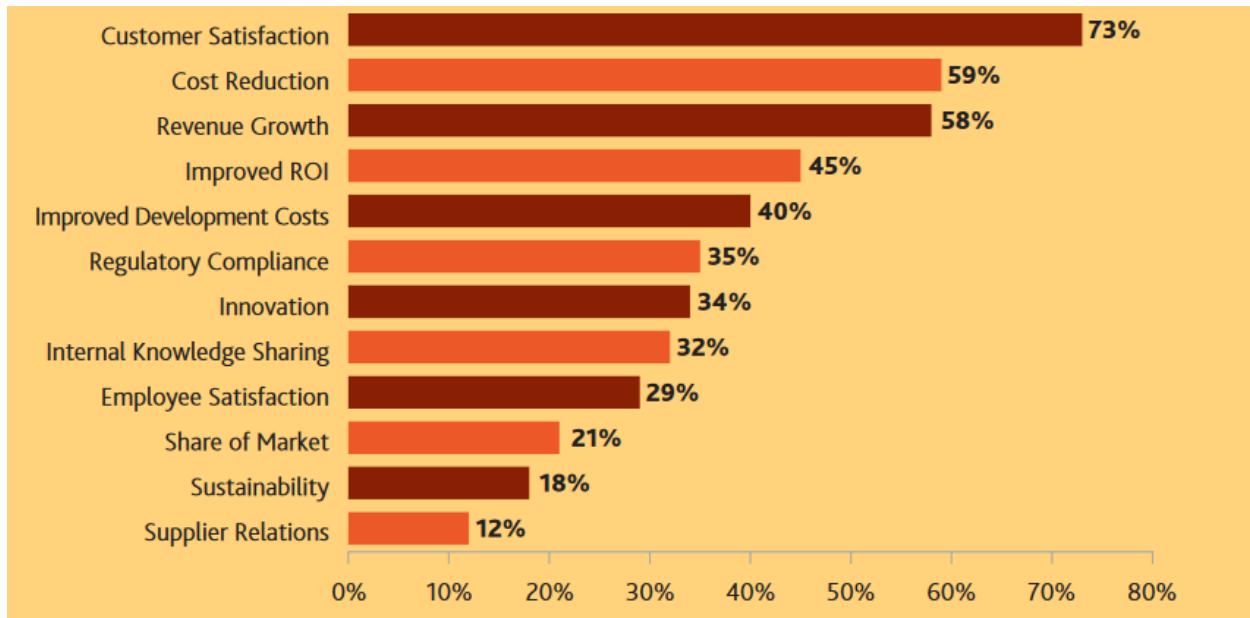


Figure 1: Why do organizations need portfolio management practices?

Source: (Subbaiah, 2014)

Above mentioned are some of the uses and benefits of the Portfolio management for an organization. It is shown in the figure 1 given above that highest observed benefit of the portfolio management is in increasing the satisfaction of customers followed by reduction of costs (Subbaiah, 2014).

Successful organizations and businesses following innovation are going for the portfolio management. It is experienced that successful innovators have well comprehended process of project portfolio management (Jong et al., 2013)

Example of innovation through Portfolio management

General electric is a gigantic company dealing in the diverse set of solutions in energy such as transportation, health, home and finance. GE is able to manage innovation portfolio to create a balance between the breakthrough and gradual innovation investments. Each business unit of the GE is managing its own innovation portfolio assessing the innovation investments. High

potential portfolio managers ask their leaders to submit at least three imagination breakthroughs in a year. GE has contributed by funding over 20 these types of projects and has generated estimated revenue of \$3 billion (Jong et al., 2013)

Innovation initiative portfolio is shown in Figure-2 below:

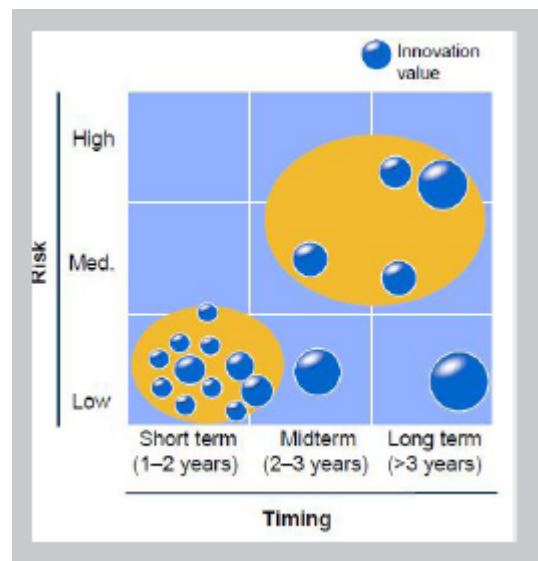


Figure 2: Innovation initiative portfolio (Jong et al., 2013)

Innovation can increase with the amount of risk to be taken. Research conducted by McKinsey has observed that successful innovators are successful because they understand the innovation portfolio by evaluating and prioritizing the projects (Jong et al., 2013)

1.7 Background of issue

The portfolio managers and the organization in fostering innovation face several challenges. The main problem is faced when prioritizing the projects and choosing the right project. Organizations are making mistake in choosing the right project, and as a consequence of which lot of challenges are faced by the portfolio managers and organizations. Major problems identified in the project are related to the portfolio managers such as misallocation of resources,

handling many projects at the same time and in house politics. These all challenges create obstructions in fostering environment of innovation. Significant effect is evidenced on the entire organization. For combating these challenges project portfolio management is considered to be necessary (Morris, 2010).

1.8 Aims of the study

The report is aimed at determining the ways through which large portfolio organizations of UAE can able to foster innovation in the organizations by adopting practices of Project Portfolio Management. The focus will be specifically on the large portfolio projects rather than smaller ones. Besides that, the research will be concentrating on the importance and role of the Project Portfolio Management in the organizations with the intension of attaining the strategic objectives of business.

The report will also unleash some other aspects related to portfolio management in fostering innovation such as challenges of implementation of Portfolio management in the organizations and resorting to the ways of implementing the portfolio management techniques in the large portfolios. Therefore, aim of the research will be assisting in analyzing the means of attaining delivery and service innovation.

1.9 Research objectives of study

Research objectives are the integral part of the research. Following are the research objectives of the report:

- a) To identify the role and importance of portfolio management in managing large projects in context of United Arab Emirates.

- b) To investigate the relationship between portfolio management and innovation in context of United Arab Emirates.
- c) To identify the ways in which portfolio management helps in fostering delivery and service of innovation in context of United Arab Emirates.

1.10 Research questions of Study

Research questions of the study are mentioned below:

1. What is the role and importance of portfolio management in the management of large projects in context of the United Arab Emirates?
2. What is the relationship between portfolio management and innovation in context of the United Arab Emirates?
3. What are the ways in which portfolio management helps in fostering delivery and service of innovation in context of United Arab Emirates?

In this part of the report, head discussion will be made on the chapters to be undertaken in further writings along with the approaches of the chapters. Following are the chapters that will be followed after:

1.11 Research variables

Effects of working experience and culture of the respondents in the portfolio-related decisions

Culture and work experience may or may not have an impact on the portfolio related decisions. The impact of culture as well as experience on the decisions is one of the major areas of interest. It has been seen that statisticians, management scientists and the economists have a positive

orientation and they are expected to be focused on some universal elements associated with decision-making. The psychologists, sociologists and anthropologists who have an expertise in the social construction are interested in the role and impact of work experience and culture on the decision making associated with project portfolio management. In this study these are the important sets of dependent and independent variables that can help in determining the factors affecting the project portfolio management decision-making or the relationship between above stated variables.

PPM and product/service innovation

Project portfolio management is one of the major aspects that improve the quality of the organization by directly positively influencing the performance of the organization. Innovation is another important area in which each and every organization has to move. Organizations are exploring the ways in which innovation in the organizations can be fostered. This indicates that another important set of dependent and independent variables is the project portfolio management and the product/service innovation. The relationship between the dependent and independent variables will be determined in this study.

PPM performance measures and new product and services success Measures"

In order to evaluate the performance of the project portfolio management implemented in an organization there are number of performance measures that are used. These measures may or may not have a relationship with the new product and service measures. The next set of variable of this study will determine the relationship between these dependent and independent variables.

1.12 Dissertation Structure

First chapter: Introductory chapter

First chapter is introductory chapter. It is the same chapter that is undertaken in this report. With the main aim to establish clarity on the subject and only then proceed to the next milestone or chapter. Approach to be followed in this part will be concentrating on the background of the study and specific issues.

Second chapter: Review of literature and research methods

Second chapter will be including the literature review on the topic. It will be on the basis of the literature review presented. The approach will be to refer to the relevant literature and to obtain the vast amount of data related to the project. For this purpose, following sources can be taken in the review of literature:

- Books
- Journal articles
- Previous research papers
- Magazines
- Reports
- If necessary, websites

Review of literature will be followed by the small introduction of the review of literature and subjects to be included in the same. Post that, description of the research methods will be given in the same draft. Here, design and methodology will be narrated. Sampling methodology will be briefed in relation to the questions, interview, charts, and correlation efficient. Followed by this rationale of the study will be given. Lastly, data collection will be discussed in the chapter along with the small conclusion part.

Third chapter: Theoretical/conceptual framework

This chapter will intend to establish the theoretical/ conceptual framework so as to understand the challenges of the portfolio management along with the ways that can foster innovation. Moreover, the key elements of the study will also be discussed in this section.

Fourth Chapter: Research methods

This chapter will focus on the research methods and techniques that have been used in the research. The research methods will focus on the data collection techniques, sampling techniques etc.

Fifth Chapter: Data analysis

This section will be entailing the chapter of data analysis. In data analysis part, data will be analyzed and visualization will be done through the help of charts and tables. In addition to that, the report will be prepared by consolidating all the previous chapters. Lastly, report will be concluded mentioning the results of the data analysis part.

Sixth chapter: Discussion of results

In this section, the results of the research will be integrated and discussed so as to extract the answer of the research question and solution to the research problem that has been stated above. This chapter will also show how findings of this research relate to the previous researches.

Seventh Chapter: Conclusion

This is the last chapter of the study. In this chapter the study will be concluded. This chapter also highlights the limitations of the study. The recommendations will be provided for the organizations and scope for future research will be discussed.

Chapter 2: Literature review

The literature review of the study is based on the assessment of important sections as it is recognized as a contribution of the others regarding the given disciplines. Since, the span of the Project Portfolio Management has always seen from the vision of executive suite for the purpose of realization of benefits. The ultimate means to gain accurate results is the selection of right project placed at first position.

2.1 Introduction of the Concept

Project Portfolio Management (PPM) is a way through which, companies can collectively manage and analyze their current and proposed projects along with the reaped benefits that are not availed if projects are handled individually. The major goal of the PPM is to find the best timings and mix of the proposed as well as current projects as it will assist in making achievement of the organization's overall goals. It leads to change in the market places, shifts in the corporate strategy and use of infinite resources. The monitoring and rebalancing of the project portfolio is done to ensure that a company is going in the right direction and getting the best value from the invested projects similar to the other financial portfolios. According to the Research of the Forrester, use and implementation of PPM tools and processes is leading to production of expected returns of up to 25% percent. It also results in some benefits such as: (1) best use of resources through focusing on the high-priority efforts, (2) the portfolio of the projects is closely aligned with the goals and strategy of the organization, (3) key projects are monitored for the performance so that corrective actions can be taken, (4) Leads to elimination of underperforming, redundant or outdated projects. This involves the management and

consideration of duplicated efforts, chronic insufficient resources, duplicated efforts and intense competition among the business groups for resources (LaBrosse, 2010).

2.2 Understanding of Project Portfolio Management

There are many issues that affect the processes of project management and enterprise planning. All such issues create an elevation for the PPM for many executive agendas of businesses. Firstly, it is necessary to explore the demands under project management within the complex enterprise environment. In this process, it is examined that why the projects are the core facets of the way in which businesses are running presently. Another question that will be examined under such process is that, why the project processes in the organizations are subject to higher level of strategic accountability and rigor. Secondly, discussion about the impacts of IT portfolio management with the emergence of Project Portfolio Management will be done. It will be shown that why businesses are emphasizing mainly on the experiences for maintaining the discipline of projects under wider framework of the business. Thirdly, a forward look towards the common misconceptions should be made regarding the project portfolio management and differences in the existing traditional approaches for the management of projects within the business. Later on, the emphasis is made upon defining Project Portfolio Management that will illustrate that, why it is important for the today's business. The final process required for getting complete understanding about the practical considerations is the determination of common problem that was faced during the management of projects and how, Project Management Portfolio seeks to address the issues. It must also consider that the best practices for the Project Portfolio Management implementations should be adopted. In addition to it, challenges for the change management should be faced. Increasing competition, mergers, new product development, off-

shoring and the outsourcing are responsible for the need of Project Portfolio Management. In an organization, projects are the representation of significant investments of the organization and therefore, the values of the projects are more focused by the business (Rajegopal et al., 2007)

2.3 Project Portfolio Management for Innovation of a Product

(Killen et al., 2008) has illustrated that before making innovation of a product, it is vital to create benchmarks, standards and identify the best practices required for the development of both tangible product-based and service-based innovation. In this study, author has developed some questionnaire for the comparison of PPM methods used, PPM challenges, PPM performances and the resulting success measures adopted by an organization for the production of diverse range of services. In the findings of the study, author has gathered the information that the PPM practices are somewhat similar to the tangible product development portfolios and service product development project portfolios. New innovative products success rates are found to be strongly correlated with the PPM performance measures. There is another strong correlation between the specific PPM performance outcomes and the PPM methods. All such findings of the project are the result of survey conducted for over 60 Australian Organizations. The results of the study are strengthened through comparing the research with the similar North American Research, however it is not the exact representation of the performance outcomes. For all the organizations that were included in the survey, each of them had their own unique PPM processes. At the end of the study, it is suggested that the examples of the complexity in the environment should be considered before creating framework. The paper has presented that the executives and PPM practitioners should make their decisions about the development of the innovative tangible and service product leading to creation of ample of benefits. In the

recommendation part, it is suggested that the existing understanding about the projects should be extended by including the tangible development project portfolios and service development project portfolio and by strengthening the links between the PPM practices as well as their outcomes.

2.4 Project Portfolio Management and Management of Multiple Projects

(Dye, 2002) in his studies revealed that presently, different managers of the organizations are facing difficulties due to management of scarce resources, constantly changing demands of internal and external customers and narrowing windows of opportunity. In addition to it, projects in the business environment are continually adding, changing and removing with response to the activities of the business and the changing conditions. As a result, many backloging projects are requiring different resources that will exceed the common management ability mandated by the priorities of project. Therefore, the major purpose of the Portfolio Management is to select the right project and prioritize on the basis of their deadlines. This paper is evidencing the issues that one seems to be the main causes of the failures in the effective project portfolio management. There is a need of management of project interdependencies that assures about the mutual compatibility. With the different project, the risk and relevance gets changed. In general, all the organizations follow the common parlance for making the portfolio of the projects. Unfortunately, the group of the independent projects is not considered as project portfolio. For making the portfolio, the long-term strategy is required to be formulated and selections of the projects were done on its basis. Project portfolio management is solely dependent upon the efficient allocation of project. Project Portfolio management and the management of multiple projects at the same time has become the two sides of the same coin from several years. The

portfolio of projects and its management is done on the basis of priority and planning of projects. The priority of the projects is decided on the basis of perceived level of urgency and on the basis of urgency, the level of risk, relative strengths and the complexity involved in the projects is determined. Thus, such projects should be important from the strategic point of view but it is necessary that the risk should be lower to minimum. The projects with the lower strategic relevance are generally found to be highly riskier. The assignments of the projects are also made on the basis of their relevance, risks and the complexities.

2.5 Portfolio management can foster innovation

After realizing the necessity of innovation for the survival of the organization, number of projects associated with radical innovation and incremental innovation are started that compete for the scarce resource along with creating a gridlock of pipeline. Cooper et al. (1997) conducted a study to determine the critical success factors in the top performing firms in context of new product development. The findings of study suggested that project portfolio management is a decisive factor for efficiency as it helps in enabling the selection of right investments and right projects that can win the war of product innovation. Similar study was also conducted by Mikkola (2001). The study argued that portfolio management helps in leading the organization in uncertainty along with estimating the set of projects that is best. Mikkola (2001) also suggested that R&D project portfolio matrix could also be used for identifying the projects that can help in generating customers along with gaining a competitive advantage. In this context, he has referred to a balanced technology and product portfolio as one of the recipes for product innovation. The figure-3 below as illustrated by (Stadnick, 2007) indicates that project portfolio management is one of the drivers of product innovation.

Drivers of Product Innovation

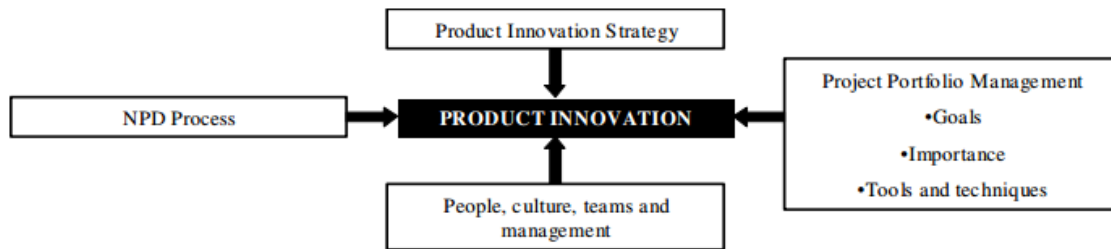


Figure-3: Drivers of Product Innovation

Source: (Stadnick, 2007)

The process of product innovation consists of number of drivers such as organizational culture, new product development and innovation strategy. In context of this project the focus will be only on the role of project portfolio management in fostering innovation. The major goals of project portfolio management are focusing on right projects, focusing on strategic alignment and focusing on the balance. Moreover, the goals extent to provide a structured setting for applying the tools and techniques associated with portfolio selection. Some of the examples of tools are bubble diagrams, financial methods, strategy and scoring models, etc. In other words, it can be said that project portfolio management enables the selection of right quality of projects at right time and at right price. According to Cooper et al. (1997), for product innovation the importance of project portfolio management is high. There are several studies that have also revealed project portfolio management as one of the weak areas for product innovation. Some of the major reasons behind this include lack of strong decision points, weak criteria for strategic decisions, limited number of resources and poor project prioritization (Cooper et al., 1997).

Dooley et al. (2003) also discussed the major causes of failure of project within the organizations. The authors highlighted the some of the difficulties associated with portfolio

management such as – poor alignment between projects and the goals, poor planning, control and implementation, poor monitoring of process results along with poor direction and poor leadership.

Similarly, another study was conducted by Khalifa and Muhammad (2014), according to the authors there is a family of three members- portfolio management, innovation and Agility.

This family can deliver the best results in context of development and execution of the strategy in the world that is rapidly changing. The portfolio management helps in aligning all the programs and projects so as to achieve the strategic objectives along with managing all the relationships and risks associated with programs and projects. Innovation plays a crucial role in inventing the solutions for the architecture of project and integration of project so as to achieve the maximum value in limited resources. Agility in the projects will help in providing flexibility to the projects along with providing flexibility. In project portfolio management innovation can further help in improving project quality and innovation (Khalifa & Muhammad, 2014).

Innovation helps to maximize the value and find a solution to maximize the efficiency of resources, find creative ways to achieve the target, and always find alternatives to achieve business value in the portfolio borders. Innovation and agility always check the road map and are the most efficient ways of achieving the highest value—or better—to change without affecting the main constraints, such as time and cost. The project portfolio management along with innovation helps in achieving the business value along with helping the organizations to achieve the market advantage as illustrated by (Biesenthal & Wilden, 2014).

ABN Bank Brazil manages its project portfolio so as to foster innovation both in products and services

Based on the literature review associated with project portfolio management it is possible to project portfolio management as a platform for accessing and evaluating the projects at different stages such as stage of completion that can also be prioritized and reviewed during the dynamic process of decision making. The process discussed above is also characterized by a high degree of uncertainty as well as by the need for strategic considerations that can allocate the resources to the projects and contribute in the sustainability of the firm. Cooper et al. (2001) have determined number of organizations along with benchmarking the common practices associated with new product development.

The ABN AMRO – Brazil recently has started to implement some of the practices associated with project portfolio management in the form of decision forums. The meetings held in ABN AMRO – Brazil consist of analysis of the portfolio of the department under a set of both the qualitative and quantitative criteria. The data collected in the bank with help of semi-structured interviews at the bank revealed that project portfolio management has brought a balance among the projects along with generating a portfolio. The approved projects of the bank have gained credibility as well as the support as they undergo an analysis by the senior members of the organization. The portfolio management helps the bank in creating a balance between different types of projects such as operational projects, regulatory projects, commercial and innovation projects. The balanced nature of the project portfolio management at the bank helps in promoting the innovation projects along with allowing a holistic approach for the selection of project.

2.6 Influence of the Business Strategy on the Project Portfolio Management

Mostly, organizations have reported about the problems they have generally faced related to the formulation of strategies. As a sole, this project is finding the linkages between the project

portfolio management and the business strategies. For the success of a business, it is required that there should be a close gap between the strategy implementation and its formulation. From the previous studies, it is found that there is a close relationship between the isolated concepts. But yet, there is no such evidence found that would ensure that there is an integral and coherent relation between the frameworks that covers the whole cycle from strategy till success. Thus, the present study related to the Project Portfolio Management is extended to the concept of strategic orientation. Based on the review of the previous study, a comprehensive conceptual model was developed that will consider about the strategic orientation, project portfolio success, business success and the project portfolio structuring. It is suggested by the author that this model can be used in the future empirical research for making registration about the influences created by the strategies over the project portfolio management and its success. Furthermore, author has also portrayed that an easy extension can also be created using the contextual factors. The organizations are actually striving for the effective usage of the scarce resources and tend to seek for the solutions that will assist in making forecasting of more spliced tasks and will allocate the most skilled person over the small task. The main purpose of the author is to suggest the organizations about the processes for the optimization of the process necessary for the allocation of the resources according to the business plans. They continue to recommend by specifying about the process of resource allocation leading to simplification of the significant projects in accordance with (Meskendahl, 2010).

2.7 Significance of Project Portfolio Management

Patanakul and Milosevic (2008) examined the effectiveness of managing the group of multiple projects. Managing multiple projects at the same time helps to identify different objectives.

Through understanding the importance of project portfolio management, a project manager can eliminate the risk associated with the multiple projects at a same time. These risks also differ in many ways.

In the increasing competition of the business, each organization has to do multiple projects at a same time to achieve success internationally. However, undertaking of organized projects is expected to attain advantage with a minimum loss of transparency in the overall project. Effective project portfolio management is a key competence for most of the companies in handling various projects simultaneously. They address tools, tasks and instruments of project management. The successful framework of project management enables to achieve effective performance as a whole (Jonas, 2010).

The project portfolio management also leads to innovation in the product and can generate the competitive edge over its competitors. The process of innovation includes the creation of new product that is based on the recognition and evaluation of opportunity (Wani et al., 2012)

2.8 Challenges and issues in managing multiple projects

Pennypacker and Dye (2002), examined various challenges and issues in relation to managing multiple projects within the organization. These challenges have been identified because the current practices in project portfolio management ignore the basic priorities of project, project standards and categories and multiple tool applications. Due to lack of standards, priorities, and applications of uniform tool, complicates the initiation of projects in the multiple project environments. The category of a project provides detailed information that is required in planning and selecting the type of project. It also examines the overall contribution of the project to the organization's financial health. Hence, according to the authors periodic reviews of current

and potential projects should be placed in the project portfolio and decisions related to the resource allocation should also be conducted in order to minimize the risk associated with the multiple projects. Kathy Boyd, a global service manager of consulting unit of Hewlett Packard's, have stated that the problems and issues of managing multiple projects are accelerated due to tight budgets, short deadlines of the project and business time frame demands. The situation of managing multiple projects is complex because of variety of reasons. However, these problems are not well defined as the company does not have any proper manner of examining the alternative ways of multiple projects (Pennypacker & Dye, 2002)

Challenges /issues	Description	Author
Due to lack of standards, priorities	One of the major challenges is the lack of priorities and standards that can help in improving the efficiency as well as consistency in the projects.	(Pennypacker & Dye, 2002)
Applications of uniform tool	The lack of uniformity in the tools negatively affects the projects	(Doloi & Baradari, 2013)
Project risks	There are certain risks involved in the projects that have to be managed effectively.	(Levin & Wyzalek, 2015)
Allocation of resources	The initial allocation of resources is one of the important aspects in the project management	(Pennypacker & Dye, 2002)

Table-1: “Challenges and issues in managing multiple projects”

2.9 Project Portfolio Management in Strategy implementation

According to Leonard and Swanepoel (2009), through the implementation of effective project portfolio management, organization can achieve its strategic objectives. Key to the successful project management requires establishment of the common terminology. Portfolio management

is a combination of more than one portfolio to achieve the organizational objectives and strategies. It produces valuable information to alter and support the investment decisions and organizational strategies. The influence of project portfolio plan upon strategy is attained through considering the six areas:

- Maintenance of portfolio alignment in context with the strategic objectives
- Allocation of human resources
- Allocation of financial resources
- Allocation of equipment resources
- Managing risk
- Measuring portfolio performance

Project portfolio management is considered as the continuous process with a purpose to integrate the activities with other organizational processes. The classic approach of formulating the strategy helps to develop the concept of how a business will compete and what are its goals and objectives that are needed to be achieved with the existing policies (Leonard & Swanepoel, 2010)

2.10 How to promote inter-alliance and excellence in business

The project portfolio management promotes inter-alliance and excellence in the business by identifying and categorizing the projects on the basis of their priority. On the pre- defined classification, the selection of the project is made to achieve the business objectives with excellence and also considers the interactions between the projects. The organization follows the approaches to promote inter-alliance and excellence in business. Therefore, the strategic benefits link between the objective of portfolio and projects. The project portfolio management

acknowledges improvement, new skills and knowledge to an organization. Analysis of all the possible alternatives of portfolio is required by the organization for effective management that ensures success to the organization (Benaija & Kjiri, 2016)

2.11 Theory of diffusion of innovation

According to Rogers (1962), diffusion of innovation is the critical process by which innovation is communicated to the people of a social system. The theory of diffusion of innovation seeks to explain the why, how and the rate at which certain technology or the idea can be spread. Everett Rogers was the professor who popularized the theory of diffusion of innovation in the book that was written by him - Diffusion of Innovations, the book was published in the year 1962. According to Rogers there are four major elements that can significantly influence the spread of an idea or technology. Human capital is one of the factors that influence the diffusion of innovation (Rogers, 1962).

2.12 Governance in multiple projects

Corporate governance includes the set of relationships among the management of a company and its owners. Through strategic decision-making, organization develops its new product that enhances its capacity and improves its competitive position and efficiency in the society. The project portfolio management focuses on selecting the right projects, which supports the strategy of the organization and also contributes towards the business success. Effective support of project portfolio management is the measure of good governance system. In the development of project management, complexity and interdependencies of multiple projects arises (Too & Weaver, 2014).

The four dimensional framework of project portfolio management consists of structure, procedure, regulative and relational dimensions. According to Biesenthal and Wilden (2014), the governance in project portfolio management is very important while ensuring successful delivery of the projects. It defines the method of achieving set objectives and also fosters the implementation of self-regulation within the objective. Hence, governance in multiple projects is concerned with creating the conditions and actions for providing innovative methods and techniques for the completion of projects. Basically, the project governance supports the organization in arranging the strategic objectives (Biesenthal & Wilden, 2014).

The portfolio governance of multiple projects provides the framework within the organization for making decisions, ensuring controls, providing oversight and overseeing the integration within the components of portfolio management. It is also responsible for making the decisions regarding resources. It possesses the activities that enable them to evaluate the performance of multiple projects at a same time. Governance in the project portfolio management is essential for achieving the strategic plan of the organization.

Apple has always been a different company. Different company is having a different view for the world. It is the company, which has offered variety of products to the consumer. Apple company products have changed the scenario of the world. It has shaped the future of millions of people. Apple's present position is highly dependent upon the innovation. This innovation is completely dependent upon the project portfolio management of the company. They have strong inspirations to create or make the difference beyond the apple. Company makes strategies according to the aspiration of the company. It is imperative for the company to have integrated system of management for the purpose of enhancing the resilience. Thus company has blended various variables of the project portfolio management so that defined objectives of the company can be

achieved. This technique has been used by the project management of the company so that, future complexities can be navigated easily. This will ensure presence of right people at right positions in the organization. Project portfolio management of the Apple helps in removing the disorganization and chaos from the business. It is an effective tool through which results of the project are improved. During the time of recession, project management gained its importance.

Project portfolio management techniques help in reducing the cost as well as the risk associated with the projects. It also enhances the success rates of the project. It has been observed that integrity, reliability, and performance are the core areas where company wish to excel without compromising on quality aspect. All these aspects can be achieved through effective techniques of project management. Company aspires to be capable of combating the challenges of increased production, quickly changing environment and increasing complexities. These aspirations can be achieved through project management techniques. Business value increases due to effective techniques of project management. It has helped the organization in strategic alignment of the objectives and goals of the company. Competitive advantage and project management techniques are positively correlated. Companies who implements effective project management techniques have an edge over its competitors. It is very beneficial for the high-risk companies. It is best suitable for the complex and uncertain environment. The advancement in global political, economic, and technical scenario has transformed the responsiveness of industry. Now it is more complicated and difficult to handle. In order to handle this modified responsiveness, project management techniques are essential. The global portfolios have been changed to managing the shareholders' expectation, to adapt the demanding customers, reflecting changing demand patterns and also to meet the regulatory changes. The risk of operational environment forces the company to identify the core business area, which demands more control and high degree of

certainty. Successful project delivery of large projects demands proper execution of business processes intended to mitigate risk. Project management techniques help in meeting the scheduling objectives. It also ensures cost effectiveness. Effective and good project management techniques can be treated as prerequisites to ensure high performance.

According to Bakouros and Kelessidis (2000), if the PPM strategy is well executed then, it will help in value creation. Along with that it, improves the project budgeting, project evaluation and selection process. It helps in aligning a project with the strategic priorities of an organization. It helps in tracking the projects effectively and efficiently. Through this technique, opportunities are bolstering so that revenue can be generated. It helps in eliminating the ineffective efforts. Thus, it saves both time and resources of the organization. It helps in gathering greater clarity of the project. It also integrates the tax planning. Project portfolio management techniques are a discipline that involves integration of services and software's to ensure total visibility in the organization. Project portfolio management techniques can be improved and enhanced through proper management. Project portfolio management has been categorized into six groups such as vision, designing, modeling, executing, monitoring and optimizing. Project portfolio management techniques ensure business management performance agilely and excellently. The sustainable Project portfolio management approaches ensure effectiveness through ameliorating the business processes in order to satisfy its business objectives and strategies. Project management involves the combination of techniques, concept, and methods that provide assistance to business process design, analysis, enactment, configuration, and administration. Implementing these characteristics in the business has ensured the elasticity and variability of the business process. Project portfolio management techniques ensure the flexibility of business design. PM techniques are an integrated and systematic approach that ensures workflow of

organization more effective. Project management techniques are necessary for any organization to respond to the changing environment and for coordinating the set of activities to accomplish the organizational objectives. Project management techniques reduce the chances of human manipulation and errors. It is constituted under infrastructure management. Project management techniques effectively connect the business department and line of business. The project management techniques notation and language are designed to facilitate the communication and integration within the organization (Bakouros & Kelessidis, 2000). It helps in managing the risk of the project. Project success is the main aim of the project management. This aim cannot be achieved until and unless, a company has adopted strategic planning, in order to have effective and efficient strategic planning it is very necessary to have project management in the company (Abdullah & Ramly, 2006).

According to Abdullah & Ramly (2006), project portfolio management involves three main parameters that are planning, execution and monitoring and controlling the business processes. Project portfolio Management is continuously redefining it and contributing to provide the valuable results influenced by the deeper analysis. Integrating the strategy of the project management with the overall firm is an important consideration to maximize the profitability. The goal of the project portfolio management is to ensure the high quality of the output by identifying the means of the causes or defects and removing them. These approaches help in the development of the policies and strategies for the process of improvement initiatives. It is the only source through which pre- defined and post- defined goals of the company can be achieved. It results in optimum deployment of resources. It is remarkable concept, which reduces the cost and assures the completion of the project. It encompasses the fundamentals of the management. In the current scenario, the concept of project management techniques assumes a significant

importance in a company, because it is challenging for them to find the ways to meet the increasing expectation of the consumers at a reasonable cost (Abdullah & Ramly, 2006).

According to Monnappa (2016), in today's scenario, competitive business environment is not sufficient enough to beat the competitors. Apart from this, budget oriented planning and strategic management process, adequate project portfolio management technique is required. It will help in the survival of the business. Project portfolio management techniques help in effective formulation of strategy after analyzing the internal and external market situation. Project portfolio management techniques are based on planning. Planning is regarded as a process through which goals are defined, tasks are outlined, schedules are accomplished and strategies are developed. Through this, organizations can set their priorities. According to the priorities, resources and energy will be defined. It provides direction to a business. It adds visibility to a project plan. Author has emphasized in his report that good practices always ensures the success of a project. Project portfolio management tool is considered as a strategic tool. It is used to drive the critical process of the organization. It helps in reaping the full value. It is very essential to have improved allocation of the available resources. It is necessary to have strategic alignment so that functional specialization can be achieved in an organization (Monnappa, 2015). Project portfolio management techniques help in defining the budget and resources at the time of the project. Success of the project is very essential because organization has deployed huge financial resources. Future course of actions is completely dependent upon the execution of project. Moreover, future profits and returns are also dependent upon the project success. Project success can be ensured if the project management techniques are applied at right place. It helps in controlling the deviation. It helps in bringing the project back on the track (Monnappa, 2015).

According to Bakouros and Kelessidis (2000), technological advancement along with the accelerated global change in the business has created lot of pressure on the business organization. Change can be facilitated and enabled effectively through project management. It helps in meeting the specific goals and objectives. Various techniques involved in the project management are planning, controlling, directing, and organizing of critical resources of the company. Presently, project management is a widely applied diverse organization and industries. Planning technique states that whole project should be divided into small tasks. Project scope, feasibility, and alternatives should be described in detail. Resource plan should be prepared which will define the availability of the resources for a particular project. Preliminary schedule should be prepared accordingly. Communication plan should be formulated. Standards and procedures of the project are to be defined. Risk is assessed in detail. Planning technique is used for defining the baseline of the project. Project techniques are challenging tasks as it is surrounded by many responsibilities. Another technique of project management is related with the execution phase. Main aim of this technique is to monitor the project goals against the baseline of the project. Techniques of the project are useful in maintaining the project workbook. Techniques of project management are a process through which necessary activities of the project are planned. It helps in achieving the goals and objectives of the company. It is a combination of science and art. It is widely used for implementing, evaluating, and formatting the functional decisions of the company. It streamlines the business operations so that optimum benefit can be obtained from available resources (Bakouros & Kelessidis, 2000).

2.13 Factors Influencing PPM

A study was conducted by Shah & Naqvi (2014) to understand the impact of the internal stakeholders such as managers and other employees on project portfolio management and its success. As per the study, the behavior of the managers and the management by the managers are the key success factors within the project portfolio management (PPM). Senior managers are considered as the key decision makers. In the context of PPM, senior managers decide on the processes and standards for the overall projects of an organization. They prioritize, select and evaluate the mechanism. Top-level managers are responsible for approving the target portfolio from a strategic perspective. In terms of conflict situations, the top level managers observe the deviations from the target portfolio and then, deliver the timely decisions for resource reallocation or projects reprioritization. Thus, the involvement of the senior managers is a key point in the portfolio structuring phase (Shah & Naqvi, 2014).

As the study conducted by Beringer, Jonas, Beringer, & Jonas (2013) suggested that engagement of the senior managers and other level of managers in the PPM influences the relationship between the manager's behavior and the success of the project portfolio management. The study suggested that role clarity affected the influence of the manager's behavior on the success of the PPM. The study analyzed the effect of the intensity of the manager's engagement on the PPM success by collecting the data from the German, Austrian, and Swiss firms and found that they are involved in PPM and represent project teams and customer interests at the portfolio level (Beringer, Jonas, Beringer, & Jonas, 2013).

Jonas (2010) studied the impact of the project portfolio managers in the PPM performance. A very few studies have discussed the role of the project portfolio manager. Many studies simply stated that project portfolio manager is the owner of certain PPM tasks such as risk management.

They in some way aim for a cross project coordination of multiple projects within an organization. These projects slightly differ from each other in terms of their objectives. Depending on the assigned responsibilities of the portfolio managers, they can be either be administrative personnel or be able to shape the future of the company or somewhere in between. Project portfolio manager is the central coordination unit of the PPM projects that supports the senior management with its specialized knowledge about the project portfolio practices. Project portfolio manager is one of the key players in realizing the portfolio strategy. It means high degree of involvement of the project portfolio manager is there in steering the project portfolio and playing a crucial role in the portfolio's success (Jonas, 2010).

A study was conducted by Disu (2017) to identify the factors that influence the PPM. Under his study he stated that in today's competitive environment, organizations strive with managing resources, selecting proper resources and prioritizing multiple projects. Unavailability of resources indicates the absence of the adequate resources required by the organization to execute all the projects. These resources include human capital, financial capital and infrastructure etc. In a case of no scarcity of resources, the reason for selecting and prioritizing the projects would be based on the other factors, since all the resources to carry out the multiple projects would be available in the organization. Hence, it is assumed that an increase in the scarcity of resources will result into a positive effect leading to the innovation in the project portfolio management. The author presents various reasons as to why project portfolio management is crucial for product innovation such as allocation of scarce resources in a proper and effective manner, better communication of the priorities in the organization regarding investment returns and achievement of the financial goals. The PPM helps to decide the boundaries for each project and then, decide the amount of resources required for the each project (Disu, 2017).

According to Handler, most of the organizations have to handle too many projects instantly without having enough capacity of the resources to complete them. As per him, PPM is the de facto best practice for delivering the projects with most value by getting the things done at the right time and in the right way (Handler, 2017).

Project portfolio management is a culture, not policies and procedures. Project portfolio management recognizes and aligns its subculture within the greater organization culture. Each project follows a distinct culture that reflects a part of the universal culture. The culture of a project team is much powerful to hold the team together through its lifecycle. The author suggested that culture of the PPM projects influences the benefits of successful projects, employees, customers and products. Changes in the culture of the projects shape the project management leadership (Banister-Hazama & Hazama, 2014).

The article presented by Petit and Hobbs (2010) addresses the impact of the uncertainty in the dynamic external environment on the project portfolio management. The portfolios are categorized as having a high degree of uncertainty and a lot of dependencies between the projects. Type of changes in the external environment include the changes in the process, changes in the government policies, changes in the customer segment, changes in the agreement with the third party suppliers, structural changes, technology changes, changes in the norms etc. In dynamic environments, there is a potential disturbance that impacts the PPM. Uncertainty in the dynamic environment draws the need to understand and manage the variability in the PPM activities. Dynamic environment uncertainties lead to the ability of the PPM to adapt, integrate and reconfigure the clusters of resources to match the needs of the changing external environment. Adoption of new approaches to handle the uncertainties in the external environment is the innovation in the PPM. The result of the study indicated that PPM uses the

dynamic capability framework to face the high level of uncertainty in the external environment (Petit & Hobbs, 2010).

Literatures have suggested that the implementation of the project management techniques plays a very important role in the success of an organization. The adoption of project management techniques has been increasing. It is regarded as the worldwide matter in the recent years because of the increasing competition and expectations in the business world. It has been observed that the tools and techniques of project management help in analyzing the current process and delivering the best practices to the business. The competition in the economy has shifted from the company orientation to the project management orientation. The organizations that have adopted the tools and techniques of the project management have been benefited in the form of both higher productivity and improved performance.

There are several challenges in fostering innovation in the portfolio management. Some of the major problems are associated with choosing the right project, prioritizing the project. Misallocation of the resources is another major issue

CHAPTER 3: Theoretical Framework

The theoretical framework is one of the important parts of the studies. Therefore, this section will focus on the basic knowledge and insights about the important of theory and the theoretical framework for the studies. Moreover, this section will also focus on the theory of diffusion of innovation and its relevance in the project portfolio management.

3.1 What is a theoretical framework?

According to Nieswiadomy (1998), “theory” is the word that originated from Greek word called "Theoria". Theoria means speculations or the beholding. Theories are always used to explain, predict and describe the control phenomena (Nieswiadomy, 1998).

The theory is known to be a currency of the scholarly realm despite all the misgivings associated with an overemphasis on the theory building (Corley & Gioia, 2011). Every journal needs a “theoretical contribution” before the publication of the manuscript. In order to fully understand that what a theoretical framework is, it is essential to determine "What is a theory?" (Wacker, 1998).

There are however a number of answers to this question. Also, there is a little agreement on the universal definition of theory. A general definition of theory is “theory can be defined as the statement of concepts along with their interrelationships to show that how a phenomenon occurs or why a phenomenon occurs (Lyytinen & Damsgaard, 2012). In this context, one of the productive questions that must be asked and addressed is about “What is a theoretical contribution?” Theoretical contribution can be defined as the significant advancement in the understandings associated with a phenomenon (Wieck, 1995). Building theory is essential because it helps in providing an effective framework that can further be used for analysis along

with facilitating the development of the field. A theoretical framework is also needed to apply the problems in the practical real world. There are however few virtues that are essential for a theory or the virtues that theory must follow. A “theory” must be a good theory with an internal consistency, uniqueness, conversation, empirical riskiness, fecundity, generalizability, and abstraction (Schmenner & Swink, 1997). Theory-building research always seeks to explore the similarities across the various domains so as to increase the level of abstraction and importance. Besides the reasons mentioned above, there is other reasons as well that support the importance of building theory (Sutton & Staw, 1995). The theory is important for the practitioners and the researchers as it provides a framework for the analysis; it provides an efficient and effective method for the field along with providing clear explanations for the world that is pragmatic. A theory usually deepens the understandings differently by showing that how the previously formulated laws and theory strictly and unexceptionally hold the limited range of application. Moving on the theoretical framework, it can be defined as the collection of the concepts that are interrelated. An effective theoretical framework directs and guides a research along with determining the things that have to be measured along with exploring the statistical relationships. The theoretical frameworks are critically deductive in nature (Sutton & Staw, 1995). In all the studies theoretical framework is an important part and they must be well thought out and very specific in nature. The theoretical framework is essential for all the types of studies such as an exploratory study. In the exploratory studies, researcher, however, doesn't know much about the research topic as the researchers try to learn more about the research topic. A researcher may or may not have knowledge about the research topic he/she is researching; it is impossible for a human being to have some preconceived notions about the research topic. These fundamental

beliefs associated with the topic may affect the personal research negatively. In this context, a theoretical framework helps as a guide that guides the overall research (DiMaggio, 1995).

A theoretical framework involves concepts along with their definitions as well as references that are relevant to the existing theory and scholarly literature that is used for the existing studies. The theoretical framework must, however, demonstrate the understandings associated with concepts and theories that are relevant to the research paper and also relate to the broad areas of knowledge. Theoretical frameworks are readily found in the literature reviews (Tolba & Mourad, 2010).

University of Southern California's Library Guides a theoretical framework that is a research from the previous literature that effectively defines the core concepts and theory of a study. In every research such as the social science research and the management research, the theoretical research serves as the foundation of future research. The social scientists and the researchers use the theoretical framework so as to craft the logical argument for their researchers. Further, a search for theoretical framework narrows down the research question along with helping the researchers to develop the hypotheses for the research. Scientists and researchers have an initial question in the mind and they critically analyze the existing literature associated with the research question. Eventually, researchers gather a number of elements associated with the same that these separate elements create a theoretical framework. Thus a theoretical framework of a study acts as a map for the overall study. Based upon the theoretical framework the original research question is rewritten (Tolba & Mourad, 2010)

3.2 The uses of theoretical frameworks

A theoretical framework helps in establishing a sense of structure that directs and guides an overall research (Grant & Osanloo, 2014). The theoretical framework offers a background for

supporting the investigations along with offering the justifications for a particular research problem. It also includes the variables that have to be measured along with the relationships that a researcher seeks to understand. Essentially, this is the point where the “theory” is built for investigating the theory (Tolba & Mourad, 2010). There are a number of uses of the theoretical framework. These uses are discussed below in detail:

The development of theoretical framework helps in clarifying the implicit theory in a clear and defined manner. It also helps in considering other frameworks so as to reduce the level of biases that can sway the interpretation. As the theoretical framework is developed, a researcher gets the opportunity to consider the alternative theories that may be potential enough challenge the perspective of the researchers. In this way, limitations associated with the theory can be understood and the problem can be better understood. A theoretical framework is essentially how the nature of the research problem is conceptualized. It also serves as the basis and the analysis that will be used to investigate the research problem. In other words, it can be said that a research theoretical framework determines that how the data of the research will be interpreted. Explanation of the theoretical framework further helps the reader in understanding the context and perspective of a research (Killen, Hunt, & Kleinschmidt, 2008).

The other uses of theoretical framework are: -

An explicit statement associated with theoretical assumptions allows the readers to evaluate a research critically. The development of theoretical framework helps in connecting a researcher with the existing literature on the research topic that strengthens the overall knowledge of the researcher. A research is guided by a relevant theory; a researcher gets the foundation or the basis for the choice of research methods and the hypotheses. Further, articulating the theoretical assumptions associated with a particular research topic allows the researcher to address the

questions of how and why. It further permits the researcher to intellectually perform transition by describing a phenomenon. Moreover, having a theoretical framework helps in determining the limits of the generalizations. A theoretical framework specifies the variables that may have an influence on the overall phenomenon (Sutton & Staw, 1995).

By the virtue of applicability nature of the theoretical framework, a good theory is always of high value because it helps in fulfilling the purposes such as explaining the meaning, challenges, and nature of the phenomenon.

Theoretical frameworks effectively provide the organization of the study. The framework guides a researcher about the interpretation of the results. There is, however, a difference between a theoretical framework and the conceptual framework. These two words are used interchangeably but there is a difference. Theoretical frameworks are based on one theory. However, the conceptual framework is associated with the concepts of the study (Corley & Gioia, 2011).

3.3 Diffusion of innovation

What is the diffusion of innovation theory?

Theories associated with innovation in the businesses have mainly stemmed from the contributions of economist Joseph A. Schumpeter. Schumpeter viewed innovation as something that is completely different from invention. According to Schumpeter invention can occur in isolation and it could or could not be coupled with innovation. Schumpeter envisioned innovation as an aspect that is characterized by following: (1) constructing new equipment or plant, (2) introducing new firms, and (3) leadership of new men. From this point of view, it can be said that innovation is an event that is discontinuous in nature (Tolba & Mourad, 2010).

E.M. Rogers developed diffusion of Innovation (DOI) Theory in the year 1962. It is known to be one of the oldest theories of the social sciences. The theory originated in communication to explain that how over the time a product or an idea diffuses or gains momentum. In other words, it can be said that how an idea or a product spreads in a specific social system or a population. The final result of diffusion is that people of the population or the social system adopts the new product, idea or the behavior. Adoption means that something is done differently by the adapter, which was not done previously such as purchasing a new product, performing a new behavior or acquiring something new. The key to the idea of adoption is that person must perceive the product, behavior or the idea as innovative or something new and hence, diffusion is also possible according to (Tolba & Mourad, 2010).

Adoption of a new behavior, idea or a product is not a process that happens simultaneously in the social system but, it is a process in which some of the people are more apt in adopting the new product, idea or the behavior in comparison to others as illustrated by (Cherry, 2012). The researchers have also found that there is a difference in the characteristics of the people who adopt innovation earlier than the one who adopts innovation later. If an innovation is promoted in a target population, it is extremely important to understand the characteristics of the target population that have the potential of hindering or facilitating the process of innovation. According to the theory of Diffusion of innovation, there are five major adopter categories. The majority of the people of the population fall into the categories that are in middle, but it is important to understand characteristics associated with the target population. Five adopter categories are given below and a diagram is also presented for the same:

1. Innovators –This is the first category and these are the people who want to try the innovation or want to try the innovation first. These are the people who are interested

- in new ideas and are venturesome. In addition, the people of innovators category are also willing to take the risks and develop new ideas. Promoters need to pay careful attention to appeal to this population (Dearing, 2010).
2. Early Adopters –This is the second category of adopters who also represent the opinion leaders. These people enjoy the roles of leaders along with embracing the change opportunities. These people are aware of the need associated with change and therefore, they are comfortable in adopting the new ideas. The major strategies to appeal to this category of adopters are to include the how-to manuals as well as information sheets for implementation. These people do not need the information that can convince them to change.
 3. Early Majority –The third category of people is the early majority, rarely a leader is found in this population, but they also adopt the new ideas before an average person adopts. These people need evidence associated with the success of the innovation before they are actually willing to adopt the same. The major strategies to attract this population include the evidence of the innovation's effectiveness as well as the success stories.
 4. Late Majority –This is the fourth category of the adopters who are skeptical of change and they adopt the innovation only after the majority of the people have tried it. The strategies to appeal this particular category of adopters are to include the information about the number of people who have tried the innovation and adopted it successfully.
 5. Laggards –It is the last category of adopters who are bound by certain traditions and are very conservative. These people are skeptical of changing and are one of the hardest groups to convince them to adopt the innovation. Major strategies for this

group of people are to include the statistics, pressure of the adopters and fear appeals (Dearing, 2010).

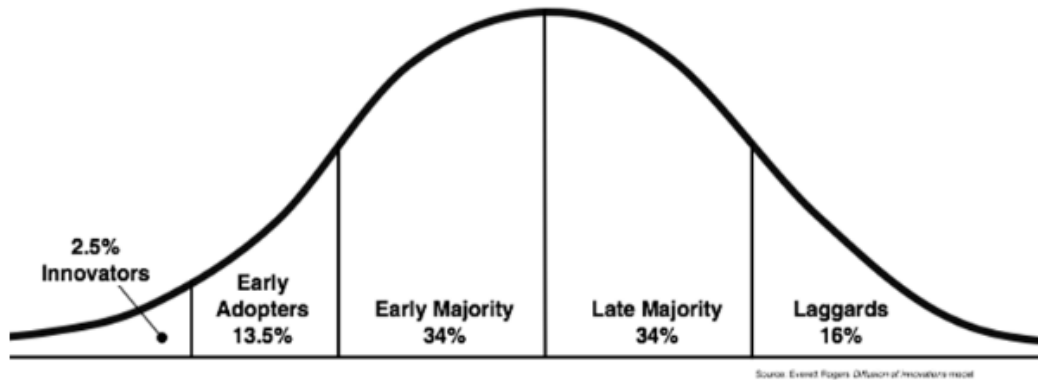


Figure-4: Stages of Innovators

Source:(Dearing, 2010)
“Diffusion of innovation”

The above diagram shows the stages of ‘diffusion of innovation’. According to the figure, only 2.5% of the people are innovators, 13.5% of the people are early adopters, 34% are the early majority, 34% are the late majority and the remaining 15% of the people are laggards.

How the diffusion of innovation theory developed (a brief history)?

The research on diffusion has gone one step further with the two-step flow theory. Gabriel Trade, who was the French sociologist, did the original research associated with diffusion in the year 1903. Gabriel Trade plotted the S- shaped diffusion curve. This S-shape curve is also of the current importance as most of the innovations have the rate of adoption of S-shaped in accordance with (Tolba & Mourad, 2010).

The research on diffusion centers on the conditions that may increase or decrease the probability of adoption of the new product, idea or a practice that may be adopted by the members of a culture. Diffusion of innovation theory also predicts that the interpersonal contacts and the media

can have an influence on the adoption behavior of the people. Rogers who gave the theory of innovation studied that how an innovation occurs and argued that there are four stages in the process of occurrence of innovation. According to Rogers 2003 these four stages are: invention, diffusion with the help of a social system, time and the consequences. The information flows from one person to another through the networks (Rogers, 2003).

Uses of the diffusion of innovation theory

Diffusion of innovations theory is used to explain the spread or diffusion of a new idea, product or the practice for more than 60 years. This theory has been ranked as one of the best theories for disease prevention and health promotion. This theory has been used in many other fields also. The theory of diffusion is an appealing theory because it explains the human behavior along with providing a guide to the designing of the interventions that can be used to change the behavior of the people. For example, the diffusion theory was used for arguing that for increasing the awareness mass media interventions are best in comparison of interpersonal interventions as these can be used for spurring the adoption (Cherry, 2012).

The diffusion model now is adopted by the organizations that need to promote innovation in terms of product, service, process, idea or the behavior. The theory defines the five kinds of adopters and the organizations use this categorization for convincing different types of people for adopting the change. There are different strategies for the different groups of adopters defined by Rogers in the theory of diffusion. As illustrated by (Lyytinen & Damsgaard, 2012) the theory of diffusion is rich because it measures the role of social networks and external influences in the adoption decision. Innovation flows effectively through a social network that sometimes accelerates the innovation and sometimes hinders the speed of innovation.

The theory of diffusion does not directly lead to the conclusion that one has to wait for the diffusion of the practice or the product to reach to the poor people etc. In fact, the theory of diffusion helps in accelerating the adoption rate in the different segments of the population with the appropriate, intensive communication. Further, in the context of promoting innovation in any of the areas, it is essential to determine the motivations of the people that differ among different groups of people on the basis of their degree of innovativeness. The diffusion theory helps in determining the motivations of the people along with categorizing the people on the basis of their motivation to adopt the innovation (Dearing, 2010).

Challenges in the use of the diffusion of innovation theory

There are some challenges in the use of Diffusion of innovation theory, these challenges are listed below:

The research associated with diffusion of innovation with the measurable and distinct features. But with this type of definition of diffusion of innovation originates a number of difficulties. Such as lack of clarity about if the list complete with all the factors that can affect the behavior of the adopter. It is also not clear that what role is played by the different characteristics at a different stage of diffusion. Further, in the Diffusion theory of innovation curve is divided into different stages. It has been seen that complex technologies, however, do not diffuse in a particular sequential manner. Many times it is also not clear that what each of the stages means in the context of the observed behavior. Another major challenge associated with the use of diffusion of innovation theory is that the theory uses the time scales that are relatively short and the mechanism that drives the overall process of diffusion does not change over the time (Lyytinen & Damsgaard, 2012).

DoI and PPM “Criticism of DoI”

Killen, Hunt, & Kleinschmidt (2007) have illustrated that before the development of any kind of innovation, it is important to develop benchmarks and determine the best practices needed for the development of product and innovation. Author has shared that PPM practices are similar to portfolio development of tangible products (Killen, Hunt, & Kleinschmidt, 2007). New innovative product's success rates are determined to be strongly correlated with the performance measures of PPM. There is a stronger correlation between the specific performance outcomes and the methods of PPM. The study recommends that managers of PPM be required to make the decisions regarding the development of tangible innovations to the development of ample benefits. It is to be noted that right investment and the right project can win the war of product innovation.

According to Harborne and Johne (2003), companies are required to be able to generate new ideas for enhancing their growth and for the same reason they are required to increase both the effectiveness and the efficiency of the process innovation. Several climatic factors that significantly affect creative performance are challenging, such as intellectual situation, positive cohesion, flexibility, autonomy, trust, clarity of mission, and support of leadership.

Ahmed (1998) has focused that the companies nowadays pay lip services to the ideas of innovation and they also stress that becoming innovative requires a culture of the company that nurtures innovation and is conducive to new ideas, same findings were presented by (Humble & Jones, 1989).

Discontinuous innovation in accordance with Birkinshaw, Bessant, and Delbridge (2006) can take many forms. It is mainly driven by the development of the new technology, like solid state

patented by the Nichia chemicals, which threaten to sample the traditional light bulb obsolete. This might come up by the emergence of a new market, as digital photography and it may trigger by dramatic shifts in the political scenery. Research study reveals that new technology opportunities and the new entrants develop markets. There are three reasons why the companies struggle from discontinues innovation. Firstly, the results of a discontinuous innovation are uncertain. The new offerings do not emerge so perfectly, instead, it comes together in a fragmented manner, so companies give up along the way in more incremental and predictable projects. Secondly, the companies find it difficult to break out the established and successful routines and thirdly, the forces of the inertia extend to a company's network and systems of relationships (Birkinshaw, Bessant, & Delbridge, 2007).

Strategies of innovation are helpful for every kind of business. According to Bowonder, Dambal, Kumar, and Shirodkar (2010), strategies of innovation helps in exciting the customers, outperforming the competitors and, developing a new portfolio of products. On the other side, Tushman & Nadler (1986) believes that the innovation strategies are helping in developing the platform on which product is being offered, reduction of cycle time, enhancement of brand value, leveraging of the technology, future profiling and acquisition and segmentation of the market. These strategies allow the company to dominate the market (Tushman & Nadler, 1986). According to Amit and Zott (2012), business model innovation can come in varied ways. Business model innovation that involves adding of novel activities by means of the forward or backward integration is referred to as new systems of activities “content”. On other hand, business model innovation that involves linking of activities in a novel manner is referred to as the new systems of activities “structure”. Additionally, business model innovation that involves changing of one or more parties performing any of the activities is referred to as new systems of

activities “governance”. Company’s business model can be categorized on the basis of 3 design elements namely content, structure, and governance (Amit & Zott, 2012).

Six Conjectures of the Diffusion of Innovation Theory Reconsidered

According to Lyytinen and Damsgaard (2012), DOI is the process through which an innovation is communicated with certain channels over time amongst the members of social systems. DOI helps in explaining the diffusion rates with help of the characteristics of innovations (Lyytinen & Damsgaard, 2012). Factors that are identified by (Nagra & Gopal, 2014) to be influencing the diffusion comprises of:

- Compatibility
- Relative Advantage
- Complexity
- Trial Ability
- Observability
- Education – demographic element

The models are mainly not specific regarding the items of diffusion. The main key question in this research study is, whether the DOI theory concerns in explaining individual adopter's behaviors in respect of portfolio management.

Conjectures of DoI theory

- Technologies are not discrete: It is not at all clear whether the list is complete and covers all kinds of features which affects the behavior of an adapter.
- Technologies do not diffuse in the homogeneous ether: In the DOI theory, the interactions in between the technology suppliers and the adopters are expected to happen on homogeneous spaces. With complex systems like portfolio management, however, the

diffusion area is neither fixed nor homogeneous. Therefore, it is necessary to employ institutional concepts for dynamically drawing the borders of diffusion spaces.

- Theory of DOI integrates with two modes of explanation, the supply and the push modes.
- Choices are the functions of the available information, and preference functions. In the theory of DOI, the adoption decisions are the functions of information, which is available, preference function and the properties of the adopters.
- The theory of diffusion does not traverse the distinct stages, which mainly exhibits no such feedback.
- The scales of time for Innovation adoption are not necessarily short.

Theoretical Framework and Components

This particular section will conceptualize literature review findings, which connect with the diffusion of innovation theory, which emerged as a dominant logic, based on the research work of (Ajjan, Kumar, & Subramaniam, 2008). The theoretical framework will be founded for research hypothesis, which will be further tested through the data of research analysis. The theoretical framework will illustrate changes in the project manager's role and will represent defined influencing factors that are behind the changes for answering questions of research and acquiring objectives of the research study. The theoretical framework below illustrates the role of project manager for project portfolio management in regard to the innovation theory.

The first framework defines the position of a project manager in the project selection and project portfolio management (Killen, Hunt, & Kleinschmidt, 2008). The second part of the theoretical framework is illustrating the reviews of literature defining the factors, which have been founded for influencing the changes of the role of project manager and underpinned by diffusion of the theory, which has been established by (Dye, 2002). Some factors that have been influencing the

project portfolio management towards driving the adoption of innovation in the project selection are mentioned below:

Literature has defined the following factors: the first factor is the involvement of senior managers for driving adoption of innovation in their projects (Mikkola, 2001). The second factor is experience level of the project manager, which shows the ability of the project manager to participate and promote portfolio management and the adoption of innovation. The third factor is governance, governance in project portfolio management is very important while ensuring successful delivery of the projects by innovating new strategies in PPM. The fourth factor is the unavailability of resources, which are identified to be driving the project manager for adopting innovation to comply with resources available for the project in accordance with (Cooper, Edgett, & Kleinschmidt, 1997). The fifth factor is organizational culture, which was determined to promote and facilitate the adoption of innovation theory through offering appropriate climate, which will help in fostering innovation adoption behavior. The sixth factor is changing external environment. Many of the researchers have affirmed that innovation has been considered as performance parameter because changing external environment parameters like political, economic, etc. influences the development of new policies in PPM (Benaija & Kjiri, 2016). Factors have been identified for applying a strong influence on project portfolio management. Changing it from the traditional one where it was illustrated at the beginning of the theoretical framework and was quite different from the stakeholder, to the new role of innovations illustrated in Figure – 5 below:

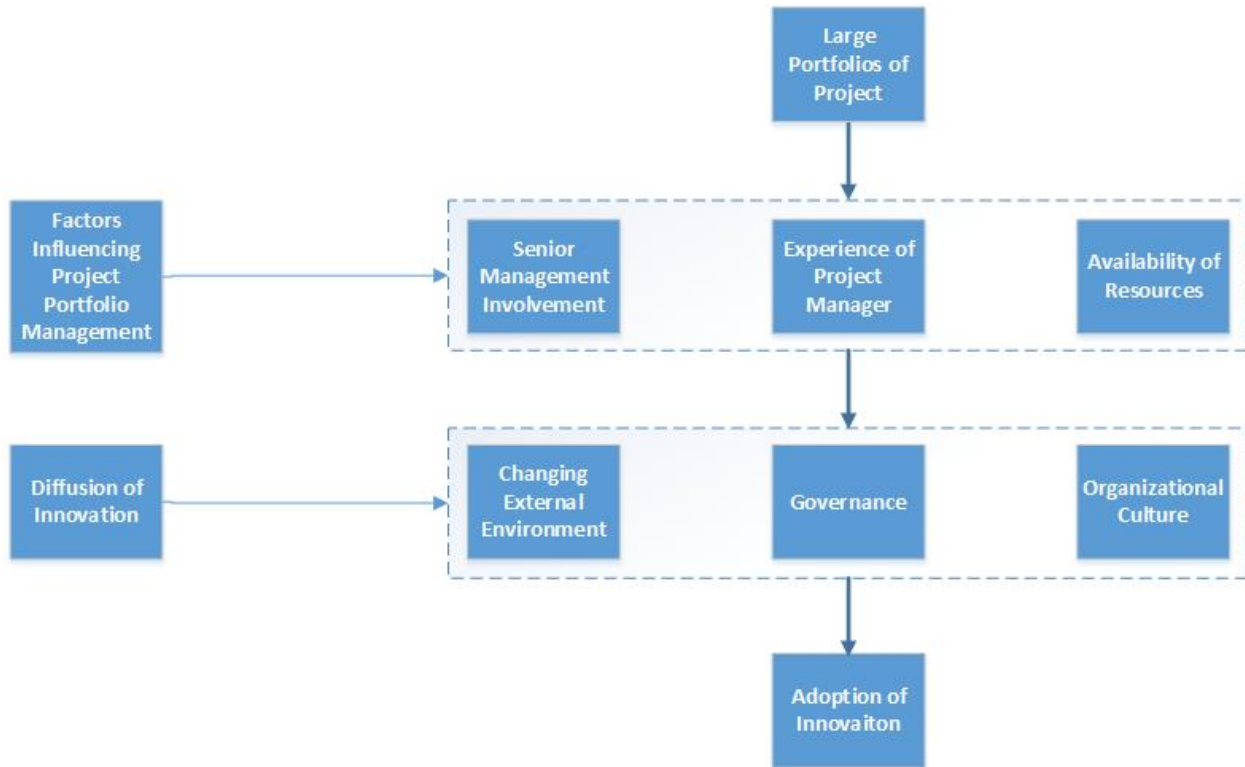


Figure - 5
Factors Influencing Adaption of Innovation (Al-Tayeh, 2017)

Hypothesis

Benaija and Kjiri (2016) have mentioned that hypothesis will be defined after the extensive review of the literature and defined the hypothesis as ‘the assumptions developed in order to draw and test logical and empirical consequences. Lyytinen and Damsgaard (2012) have pointed out that the hypothesis drawn from the review of literature will be based on the relationship between the dependent and the independent variables.

(Shah & Naqvi, 2014) illustrated that the involvement of senior managers and line managers has a positive impact on the performance of the project portfolio management. The reason behind this is that managers pay attention to the competent communication to prejudice the stakeholders of the project portfolio on project portfolio management success. Senior managers have a convincing impact on the project portfolio management success. The involvement of senior

management in making decisions regarding the project portfolio is expected to affect the adoption of innovation in project portfolio management. The request of senior managers for information about the project portfolio could help the organization to manage its portfolio in a better way. The awareness of the senior managers on the portfolio brings better transparency and supervision on information about the projects in a portfolio to make informed decisions (Disu, 2017).

A study conducted by Beringer, Jonas, Beringer, & Jonas (2013) suggested that managers at all the levels could influence the success of a project portfolio. This influence can be related to the behavior of the managers. The manager behavior literature describes the extent to which the managers can engage themselves in the management of project portfolios and also engage other employees (Beringer, Jonas, Beringer, & Jonas, 2013). So, it can be asserted from the review of the previous studies explained in the literature review that each level of managers is supposed to comply with their specific role with respect to the project portfolio management. Hence, it is necessary to consider the role of the managers in the success of the project portfolio management system.

H1: The involvement of senior managers has a positive relationship with the project portfolio management success

According to Jonas (2010), a project portfolio manager is supposed to be pivotal in planning and controlling the projects more effectively and efficiently. He/she should also be effective enough in implementing project portfolio management practices as a management innovation (Jonas, 2010). As per the review of the article and as explained in the literature review, it can be said that project managers have some level of contribution in driving the portfolio project management to foster innovation. So, on the basis of above discussion following hypothesis can be advanced:

H2: The greater the project portfolio manager's engagement in PPM, the better prospects for success of PPM.

The portfolio governance of multiple projects provides the framework within the organization for making decisions, ensuring controls, providing oversight, and overseeing the integration of the components of portfolio management (Biesenthal & Wilden, 2014). The portfolio governance helps in making the decisions regarding effective utilization of resources. It possesses the activities, which enable in evaluating the performance of multiple projects at the same time. Governance in the project portfolio management is essential for achieving the strategic plan for the organization. According to Biesenthal and Wilden (2014), the governance in project portfolio management is very important while ensuring successful delivery of the projects by innovating new strategies in PPM. It defines the method of achieving set objectives and also fosters the implementation of self-regulation within the objective. Hence, governance in multiple projects is concerned with creating the conditions and actions for providing innovative methods and techniques for the completion of projects. As per the review of literature, governance is the way of selecting the right project that supports the strategy of the organization and also contributes towards the success of the business. So, in a case of effective portfolio management, the good governance system defines the method of achieving set objectives and also fosters the implementation of self-regulation within the objective. Hence, governance in multiple projects is concerned with creating the conditions and actions for providing innovative methods. So, governance can be linked to adoption of innovation in the project portfolio management (Too & Weaver, 2014). Further, Biesenthal and Wilden (2014), suggested that the project governance supports the organization in arranging the strategic objectives for the management of the project

portfolio (Biesenthal & Wilden, 2014). Thus, based on the above discussion and as per the literature review following hypothesis can be framed:

H3: Governance in the project portfolio management is positively related to the success of project portfolio management during the adoption of innovation

As per the Disu (2017), scarcity of resources force the managers to adopt some new approach that can allocate the resources in such a way that, work does not hamper and maximum tasks are covered under it (Disu, 2017). According to Handler (2017) the shortage of resources is a global trend that demands new and creative solutions. It pushes the boundaries of current possible methods. Program and portfolio management leaders enable the best practice for delivering the most value by getting the right things done at the right time and in the right way (Handler, 2017).

The above discussion and the discussions within literature review leads to formulation of hypothesis that unavailability of the resources in some ways force the managers to adopt new methods.

H4: Unavailability of resources influences the project portfolio management towards the adoption of innovation.

According to Banister-Hazama & Hazama (2014), the culture of an organization is regarded as the overall readiness of the organization to change and to innovate. If an organization's willingness to change and to innovate is high, this shows the openness of the organization to adapt to project portfolio management Adoption of project portfolio management is an innovation on its own and it comes with a lot of challenges. The adoption of change depends upon the culture of the organization. The low level of resistance shows the high level of innovativeness of the organization to adopt. The discussion above along side the literature review leads to formulation of following hypothesis:

H5: Organizational culture influences project portfolio management towards the adoption of innovation.

Company aspires to be capable of combating the challenges of increased production, quickly changing environment, and increasing complexities. The advancement in global political, economic, and technical scenario has transformed the responsiveness of industry (Burn, 2013). Patanakul, Curtis, and Koppel (2012) proposed that in order to investigate the effectiveness of the PPM in terms of handling risk and opportunities of the external changes, it is necessary to form and govern project portfolio in such a way that can align strategic direction of the organization with the external risk and opportunities (Patanakul, Curtis, & Koppel, 2012). As per the Petit and Hobbs (2010), during the dynamic environmental changes, portfolio management team needs to examine the current criteria in the strategic plan and look for innovation (Petit & Hobbs, 2010). In the face of changing environments, the enterprise might have to reconfigure and reassign existing capabilities and potentially develop new ones (Burn, 2013). Thus, and from the discussion made within the literature review, it can be said that external environment variables such as political, economic, social, environmental, etc. influence the company's project portfolio management. This leads to the following hypothesis:

H6: Changing external environment influences project portfolio management towards the adoption of innovation.

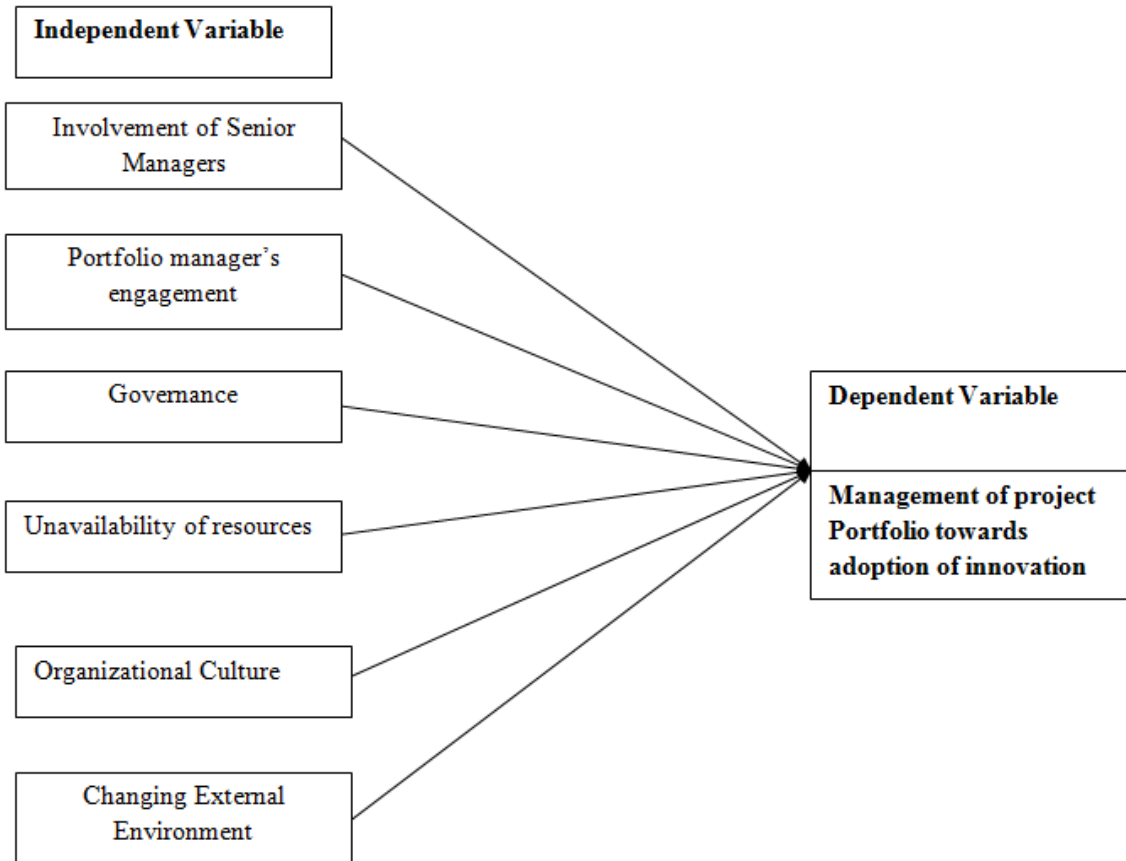


Figure 6: Research Hypothesis Diagram

Application of diffusion of innovation theory in project portfolio management

Project portfolio management can be defined in the literature as the decision process that is dynamic in nature. In the project portfolio management new projects are evaluated, prioritized, and selected along with accelerating the existing projects. The resource is also allocated or de-allocated among the various projects. Project portfolio management focuses on the successful completion of the project as it is concerned with the management of the projects that are directly associated with organization's strategy. The theory of innovation of diffusion plays an important role in the project portfolio management. The adoption of project portfolio management, however, is impacted by number of factors such as the external factors. The external pressure

forces the organization to use information technology for the strategic purposes. One of the studies found that the organizations that are facing environmental uncertainty tend to quickly adopt the telecommunications technology. In the competitive environment, the organizations need to evaluate the portfolio processes along with adopting the innovation process so as to gain the competitive advantage. In the context of project portfolio management, many of the studies have identified the external pressures as one of the essential factors that affect the adoption and implementation of PPM. There are many organizations that are adopting PPM because of the changing competitive pressure as well as the changing regulatory requirements.

There are a number of innovation attributes that have a significant relationship with the adoption decision in the project portfolio management. These attributes are the expected benefits, cost, complexity, compatibility and the quality of data that is available within the organizations (Ajjan, Kumar, & Subramaniam, 2008).

The expected Benefits refer to the extent to which adoption of innovation can provide best outcomes in comparison of current technologies. If an innovation is expected to provide the benefits, then it also provides the legitimacy associated with the adoption decisions of the organization. Some of the promises of adopting the portfolio management include the benefits such as an improved business communication, reduced cost, improved project outcome, and improved business accountability. These factors facilitate the adoption of PPM. Compatibility further refers to the extent to which innovation is consistent with the existing values and needs of the adopters. A new innovation typically requires the change in the existing procedures that can also affect the relationships between different organizational units and the personnel. The higher will be the compatibility of the innovations more is the chances of its adoption. Complexity is another factor that can affect the adoption of innovation in the project portfolio

management. Complexity refers to the degree to which the innovation is perceived as difficult to use, learn and understand. This factor, however, hinders the process of innovation adoption the project portfolio management. Next factor is the cost of the innovation process. This presents a major barrier for the organization. The previous researchers have found that more is the cost of innovation less is the likelihood of its adoption. The quality of the data existing in the organization also has an impact on the adoption of innovation in the project portfolio management. In the context of PPM, the data associated with existing projects must be collected and distributed to all the project management processes so as to make portfolio management highly effective.

The above discussion indicates that theory and the theoretical framework are the important parts of the research that provide a foundation for the research along with guiding or directing the research. Further, the theory of diffusion of innovation is one of the important theories that help in explaining the adoption process of innovation. There are however few challenges in the implementation of the theory (Ajjan, Kumar, & Subramaniam, 2008).

CHAPTER 4- Research Methodology

4.1 Research Methodology

According to Creswell (2013), research methodology is the conceptual structure within which a research is conducted. It is necessary to properly frame the research methodology for every research study because on the basis of the research methodology, the final analysis is performed and if all the variables under the research methodology are not properly framed then, it may not give the proper results, which the researcher is expecting from the study. Improper selection of the tools under the researcher methodology makes the study irrelevant and ambiguous (Creswell, 2013). Kothari stated that research methodology is a process of studying how a research is carried out. Research is a process of collecting data and information regarding a topic and through the data collected; the researcher comes to a final decision. Research is conducted so as to find the solution to a problem or generate the decisions (Kothari, 2004). The research methodology for the study will include the selection of appropriate data collection technique, research design, material and equipment, testing procedure sample size and sampling methods. The analysis and the testing of the variables are performed on the basis of the selected tools under this research methodology section (Kumar, 2010).

Pandey and Pandey (2015) stated that it is beneficial to formulate a research methodology for the study as it minimizes the total expenditure, facilitate smooth scaling, collect the relevant data and technique, provide blueprint for the plan, provide an overview to the experts and provide a direction.

4.2 Sources of Data

Basically, there are two sources of data collection namely primary and secondary. The selection of data collection source depends upon the subject of a research (Babbie, 2013). Mostly, the researchers use both the methods to collect the data and in this particular research also both the primary and secondary data collection source has been chosen for answering the research questions and for achieving the research objective (Shodhganga, 2012).

According to Hox and Boeije (2005) secondary research involves the collection of the data from previous and existing researches and reports. There is a variety of information available on the selected industry, research topic and other variables. It is available in written or in electronic form. Researcher can collect the data from related articles, journals, reports, newspapers, libraries and Internet. In this research, the data is collected from the research that is already been assembled by previous researchers and is related to the topic of research under study. Reason for collecting the secondary data is to frame the questions and identify the loopholes in the previous study and cover them into the current study (Wyk, 2016). The collected and analyzed data from the secondary research is presented in the form of literature review and it is used to frame the aims, objectives and research questions for the further study. Data for the secondary research will be collected from the authorized journal articles, papers, reports, books, Internet etc. (Hox & Boeije, 2005).

With the help of secondary data collection tools, a literature review in this research is conducted covering the various aspects of the research topic such as project portfolio management and its need for innovation of a product, management of multiple projects through project portfolio management, significance of PPM (Project Portfolio Management), Challenges and issues in managing multiple projects, Theory of diffusion of innovation, Governance in multiple projects

etc. literature review through secondary data collection methods helps to formulate theoretical framework for the study.

As per Hox and Boeije (2005) primary research is called the first hand research where the researcher collects the actual data from the target audience (Hox & Boeije, 2005). In primary research, data collected by the researcher is totally related to the research topic, aims and objectives. Researcher can use any of the data collection methods like survey, interview, experiments, observations and focus group (IS, 2016).

In order to identify the role and importance of the portfolio management in managing the large projects, to investigate the relationship between the portfolio management and innovation and to identify the ways in which portfolio management helps in fostering delivery and service of innovation in the organizations of UAE, it is necessary to conduct the primary research in the UAE's organizations so that actual information can be gathered in the context to UAE scenario. Hence, a primary research is conducted through the use of survey instrument. During survey, participants are asked about their opinion and behavior on the prepared questionnaire. A set of demographic and analytical questions is prepared as per the objectives and aims of the study. Different methods are used to collect the data from the target audience in a systematic way. Data is collected through phone survey, mail survey or face-to-face survey as per the convenience of the respondents. The primary research aims to answer the specific questions and study the current situation of the project portfolio management in the large organizations of UAE. Primary research has been chosen, because it helps in providing the information that is directly related to the research study. However, collecting primary data is a time consuming and expensive process too but, the data and information obtained is highly beneficial in the context of answering the research questions (Barson, 2003).

4.3 Research Design and Approach

Basically, there are 3 types of research design namely qualitative, quantitative, and mixed research approach (Greener, 2008). Selection of appropriate research approach is most important while conducting a research study because it is the method through which a researcher can collect relevant and current data for the research and deduce the results for the set research objectives. Research design must be framed according to the nature of the problem and also, the type of research changes (Pandey & Pandey, 2015).

Our research is based on the testing of the hypotheses and according to Kothari hypothesis testing research studies are those wherein the researcher tests the existence of relationship between the variables (Kothari, 2004).

There are 2 types of research approaches namely inductive and deductive approach. The application of inductive approach is associated with the qualitative methods of data and it moves from a specific observation to generalization. It is a bottom up approach and more open ended and exploratory. In this approach, first observations are made and then theory is formulated. The deductive approach is perceived to be related to the quantitative methods wherein first the hypotheses are formulated based on extensive literature review and then they are tested (Crossman, 2017). In this study, researcher has derived 6 hypotheses based on literature review. These hypotheses have been tested using data collected from survey.

Hypothesis tests the relationship between two variables. To test the relationship between the two variables, it is required to collect data for the defined variables. Testing of the hypothesis is performed with the help of techniques such as correlation, regression, or t-Testing. To perform the testing, data must be in numeric form only. That is why it is necessary to select the

quantitative approach rather than qualitative approach because it is only possible in quantitative approach to convert the response of the respondents into numeric form. The qualitative approach does not facilitate the author to convert the responses into numeric form that is why hypothesis fits in quantitative approach.

Bryman (2006) stated that such studies require an approach for exploring and understanding the meaning of the individuals to a social or human phenomenon. The target audience for this research study is large. Hence, qualitative approach cannot be used, as it would result in high cost and time. Hence, the suitable approach for data collection is quantitative approach. The data are collected from the target audience selected for the study, to answer the relevant questions of the study regarding the innovation in project portfolio management in the context to UAE organizations. This is because quantitative research is more objective and reliable in nature and it also helps in generalizing the findings. Further, the complexity of the research problem is also reduced as the study becomes limited to certain variables. Quantitative research further allows measuring and analyzing the data that are essential for obtaining the accurate results. Last but not the least, quantitative research has been chosen because the researcher can be more objective in the context of the findings of a research (Mangan, Lalwani, & Gardner, 2004).

4.4 Population Size

The total target population for the study will be the total number of managers in the large organizations of UAE, who has been working on the management of large portfolio of projects. The population size is assumed to be 500. With population size being large, it is infeasible to collect the data from each individual, as it is time consuming. So, to complete the research within the stipulated timeframe, it is required to select a small sample size from the target audience and collect the data from the selected individuals. By assuming the similar demographic behavior of

all the individuals, the results of the analysis are generalized on the total population. To select the sample size from the total population different sampling techniques are used.

4.5 Sampling Techniques and Sample Size

Crossman (2017) explained that sampling techniques are used to select the sample size from amongst the total population. Suresh, Thomas, & Suresh (2011) proposed that it is impossible to collect the data from each and every individual from the targeted population because of time and money constraints, so the researchers select a small sample size from the target population and collect the data from the selected respondents and then, generalize the result of the collected data on the total population assuming the fact that selected sample size contains all the opinions and beliefs of the total population (Suresh, Thomas, & Suresh, 2011). There are two techniques for sampling named: probability and non-probability sampling (Heckathorn, 2011).

Omair (2014) suggested that when the budget and time scale for conducting a study is very small and only one researcher is conducting the study, it is feasible to use convenience non-probability sampling technique where the data are collected as per the convenience of the researcher and the individuals (Omair, 2014).

The selection of proper sample size is important to ensure accuracy of data (Vieira, 2017). The choice of proper sample size depends upon the two measures that affect the accuracy of the data. The first measure is margin of error or confidence intervals. It is the deviation between the opinions of the respondents and the opinion of the entire population. The margin of error varies from 1% to 5%. The margin of error 5% means that 95% of the entire population actually thinks the same way as the sample audience would respond. The second measure is the confidence level that tells that how often the percentage of the population whose answers are matching the answers of the sample population actually laid within the boundaries of margin of error. The

confidence level 95% assures that 95% of the total population results fall within the specified range of values (Bartlett II, Kotrlik, & Higgins, 2001).

Table 2: Table for determining minimum returned sample size for a Given Population Size for Continuous and categorical Data

Population size	Continuous data (margin of error=.03)			Categorical data (margin of error=.05)		
	Alpha = .10, t = 1.65	Alpha = .05, t = 1.96	Alpha = .01, t = 2.58	P = .50, t = 1.65	P = .50, t = 1.96	P = .50, t = 2.58
100	46	55	68	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1,000	77	106	173	213	278	399
1,500	79	110	183	230	306	461
2,000	83	112	189	239	232	499
4,000	83	119	198	254	351	570
6,000	83	119	209	259	362	598
8,000	83	119	209	262	367	613
10,000	83	119	209	264	370	623

The above table was developed by Bartlett II, Kotrlik, & Higgins (2001) for determining minimum required sample size for a given population size for continuous and categorical data.

Continuous data refers to quantitative data where the infinite number of values for a given range or interval are possible. For instance, weight, height, temperature, etc. It cannot be counted. On other hand, categorical data includes a finite number of distinct groups or categories. These types of data usually do not have any logical order. Some of the examples of categorical data are educational level, gender, etc.

In this research, data collected will be categorical in nature as options for survey questions are based on 5 point Likert scale.

Margin of error is the small amount of total data that can be allowed for the miscalculation or change of circumstances. It actually tells how much percentage is allowed in your results that can differ from the real population. For example, 95% of the confidence level with a 5% of margin of error indicates that the statistic will be within 5% points of the real population value 95% of the time. For this research margin of error is taken as plus or minus 5%. The alpha level used in determining sample size in most educational research studies is either .05 or .01. In general, an alpha level of .05 is acceptable for most research. That's why in this research the value of alpha is considered as 0.05. Based on table, considering margin of error 0.05 and alpha 0.05, the sample size for population of 500 comes out to be 218 (Bartlett II, Kotrlik, & Higgins, 2001).

All the selected companies are the large public and private sector organizations of UAE as the questionnaire is distributed to the various individuals as well as university students who are employed in public and private sector organizations. It is not feasible to collect the data from all the public and private sector organizations of UAE. The selected respondents are at the managerial profiles in their organizations and handling management of a large portfolio of projects. Both male and female candidates are given equal priority to take part in the survey. In terms of age and years of experience, no criteria are defined.

4.6 Method of Primary Data Collection

A researcher may require many data collecting tools. According to Hoyles, Küchemann, Healy, & Yang (2005) data collection is the process through which data are collected in a pre-defined fashion and in such a way that, data are effective enough to answer the research questions, test the hypotheses along with evaluating the outcomes (Hoyles, Küchemann, Healy, & Yang, 2005).

Tools may vary in interpretation, complexity, design and administration. Every tool is suitable for the collection of certain type of information. There are different types of data collection tools such as questionnaire, interviews, schedules, focus groups, observations, rating scales etc. It is very important for a researcher to ensure the accuracy and appropriateness of data collection (Kowalczyk, 2016).

In terms of merits and demerits of questionnaire tool, Mathers, Fox, and Hunn (2007) suggested that it is most precious and quick form of data collection. It facilitates a researcher to collect data from more than one respondent at a time. In questionnaire method, there are chances for getting biased, wrong and incomplete responses but in this research study, it is most suitable because it covers the wider research area and it is economical.

In this research, the focus is on Managing Large Portfolio of Projects to Foster Delivery & Service Innovation in the context to UAE organizations. The discussed above survey method is used to collect the primary form of data. Of all the defined methods of data collection, questionnaire method is the most appropriate method for data collection from the targeted audience in this research because it is most suitable to collect data from large audience in a small time span.

The general design of the questionnaire includes a process that constitutes some steps such as specification of the information needed, defining the target audience, specification of the type of mode for survey such as paper pen mode, email mode etc., determination of the contents of the individual questions, filtration of the questions as per the difficulty level to answer them, selection of the questions structure, determining the question wording, identification of the form and layout etc. (Hair, Money, Samouel, & Page, 2007).

The demographic questions are necessary to include in the questionnaire as they represent the target audience and on the basis of these it can be identified that what type of people are more adaptive to the innovation and foster innovation in project portfolio management. Gender, age and experience of the individuals have been included to know how these factors influences the choices of respondents and to identify whether age, experience and gender influences the adoption of innovation in the project portfolio management (Sharma, 2012).

The second section of the questionnaire is the conceptual section questions. The conceptual section questions are generated on the basis of reviewing the literature, problem definition, hypotheses framed, independent variables, and dependent variables (Singh, 2010).

In this method of data collection, questionnaires were distributed to the respondents so that they can fill their responses (Statistics Solutions, 2016). The chosen questionnaires are based on the Likert scale technique. In this technique, the respondents have to mark their responses on a scale of 1-5 ranging from strongly agree to strongly disagree (Avolio & Bass, 2004). Questionnaires helped in gaining the responses of a number of respondents in a limited period of time and with limited resources. Survey was done with the employees of the large organizations of UAE who are currently working on large portfolios of projects. The structure of the prepared questionnaire is all close-ended questions where less freedom is given to the respondents. Questionnaire includes both demographic and conceptual questions (Saunders, Lewis, & Thornhill, 2012). Conceptual questions are framed on the basis of the developed hypotheses, dependent and independent variables. The preferred mode of conducting the survey will be Email mode as this mode is the best suitable to collect the data even when the selected people are far away and they don't have time to personally interact with the researcher. Although in this method there are chances that respondents can omit to respond to the survey or don't attempt the whole survey

yet, in a sample size say for e.g. 100, the researcher can opt for this mode as he/she has less time and resources to collect data on paper pen mode (Kumar, 2010). In this research study as the quantitative approach is used to collect the data so I found email approach as the best suitable approach to collect a large amount of data from large audience in a few days by sending a questionnaire to the respondents through Email.

An introductory email was sent to participants to inform them about the context and importance of the research activity that would be carried out. Ensuring that the names of participants will be treated confidentially and will not be published in this work.

4.7 Material and Equipment

To analyze the data, SPSS software has been used. The correlation and regression analysis has been used to identify the existence of relationship between the two variables and to check the acceptance of hypotheses (Sphweb, 2017). Correlations analysis is used to check the existence of relationship between the two variables while the regression analysis has been performed to identify the level of relationship between the dependent and independent variables (Pallant, 2010).

Uyanik & Guler (2013) stated that regression analysis is performed to identify the relationship between a dependent variable and one or more independent variables (Uyanik & Guler, 2013). Hypotheses are prepared to evaluate the dependency of the dependent variable on the independent variable. Single independent variable is denoted by X and single dependent variable is denoted by Y. Regression analysis measures the significance level of relationship between the two variables on which hypothesis is prepared (Lenell & Boissoneau, 1996). The technique used in this research study is regression analysis technique. With the help of SPSS (version 22) tool

data analysis is performed. Microsoft excel is used to transform the data in a more presentable form “i.e. to present the data in the result by using pie charts and graphs”.

4.8 Data reliability and validity

Reliability and validity are important components of research design. Reliability is the degree to which the data collection instrument provides same result if research is repeated (Andrew, Pedersen, & McEvoy, 2011). It helps research to know reliability of data collected. Reliability tells about the accuracy and replicability of measurement. Under the reliability test data are measured and collected consistently according to standard definitions and methodologies; the results are the same when measurements are repeated. Reliability test tells the intensity and direction of a relationship between two or more variables. Reliability of research instrument can be measured using Cronbach’s alpha and pilot testing. Under the pilot testing, a small-scale study was conducted to test the reliability of a data collection tool (Cheliotis, Lu, & Song, 2015). The study will get benefit from the reliability test in terms of accuracy of result from the collected data. The more accurate the result, the more reliable will be the research study to consider in future. It is also recommended that a minimum level of .70 in Cronbach’s alpha is the most reliable scale. If the value of Cronbach’s alpha coefficient is equal to .70 or more, it means the data, collected in the study can be considered authentic and reliable(Hair, Money, Samouel, & Page, 2007). Here in this study, researcher used Cronbach’s alpha approach to measure the reliability of the instrument.

Validity refers to degree to which data collection instrument measures what it intends to measure. It helps researcher to examine whether or not an instrument addresses its designed purpose. On a test with high validity, the items will be closely linked to the test's intended focus. If a test has poor validity, then it does not measure job-related content and competencies it ought

to. Thus, it can be stated that it is necessary to conduct the validity test in this research study to achieve the exact and actual results that can conclude the objectives of the study fairly. It is necessary to conduct both reliability and validity test because without both these tests research outcome cannot be considered as valid or reliable. Basically, there are three types of validity approach: Face, Content and Criterion Validity (Andrew, Pedersen, & McEvoy, 2011). Out of these approaches, content validity is the best suitable approach to test the validity of the collected data. It estimates how much a measure represents every single element of a construct (Drost, 2011). In this research study, researchers have used content validity approach to measure the validity of instrument. The experts were consulted to judge the questions to measure their validity to cover all the material. The experts were the senior project managers who have the experience of more than 20 years in this field. Teams of two senior project managers were contacted to review the questionnaire. They reviewed the questionnaire on the basis of their experience and current trends in the industry and further suggested if any modification required.

4.9 Summary of Research Methodology

The research methodology has been conducted in order to answer the research questions, fulfill the research objectives and to be consistent with the research methodology that has been proposed in this chapter. This chapter proposed that firstly, the data is collected using both the primary and secondary sources and therefore; journals and books have been used for collecting the secondary data and questionnaire method has been used for obtaining the primary data. The sample size for the study is 500 respondents and to select the relevant respondents, convenient non-probability sampling technique is proposed in this chapter. Further, it was proposed in this chapter that collected data will be analyzed using the statistical means and hence, the data collected has been analyzed with the help of SPSS tool and the analyzed data has been presented

in the form of pie charts and graphs in the report. Therefore, it can be said that each and every activity of this research is related to the activities proposed and decisions taken in this research methodology chapter. The research methods are also highly effective in all the contexts. With the help of results of this chapter, following chapter 5 will be prepared by using the proposed techniques of this chapter.

4.10 Survey questionnaire design

The questions of the survey have been developed on the basis of reviewing the literature and research objectives. First of all, some demographic questions are prepared to know the background of the respondents. There are total two sections in the questionnaire. First section is the demographic section and the second section is the conceptual section. All the questions have some options and respondents can select only one option out of the given options for each question. In the section conceptual section there are total 7 sub-sections. Each sub-section containing 3 questions for each independent and dependent variable. The questionnaire will be uploaded on one of the supporting websites (Google form, Survey Monkey, eSurvey Creator...etc.) and the responses will be collected from there only. The objective of the study related to the identification of the relationship between the portfolio management and innovation will be identified with the help of questions developed on unavailability of resources and innovation to solve this issue. The objective related to how portfolio management helps to foster delivery and service of innovation will be achieved through the questions developed on change external environment, governance and innovation.

The Questionnaire was uploaded into Google forms. Please check the link (<https://goo.gl/forms/lfxkzSHEhMMXtkeK2>)

CHAPTER 5- Data Analysis

Introduction

The research is conducted with an aim to determine the ways through which large portfolio organizations of UAE can be able to foster innovation in the organizations, by adopting practices of Project Portfolio Management. Besides that, the research is concentrating on the importance and role of the Project Portfolio Management in the organizations with the intension of attaining the strategic objectives of business. On the basis of the literature review, the research has developed the theoretical framework and identified 6 variables that may influence the PPM towards innovation. In this section of data analysis, the relationship of these 6 variables has been determined with the PPM success and innovation. A total of 6 hypotheses have been framed on the basis of the conceptual model of the study. For the prepared questionnaire, the data were collected from the 219 respondents from the large organizations of UAE. In this section, the data analysis has been performed with the help of the technical tool. The data which are collected through the survey is changed to the numeric form and saved in the excel sheet. Responses for all the respondents are aligned on the question basis in a row form. Here, in this section, calculating the value of the correlation coefficient in the SPSS toll performs hypotheses' testing. On the basis of the correlation analysis, the relationship between the variables of the study will be interpreted.

Demographic Profile of the Respondents

This research study asked some general demographic questions from the respondents such as gender, age, designation, education qualification, years of service, type of organization and number of projects per year. A total of 500 questionnaires were distributed and 218 usable ones were obtained, resulting in a response rate of 43.6 percent.

Out of the received responses, 82 percent of the respondents were male and 18 percent respondents were females. This shows a higher proportion of male employees in the large organizations of UAE. A large number of respondents belonged to the age group of 30 to 40 years old (32 percent). 26 percent of the participants were between the ages of 40 to 50 years. The percentage of respondents from the below 30 age group was comparatively lower to other sections. Around 24 respondents were from the above 50 years of age group. This shows that seniority level of the employees in the big organizations of UAE is high.

Demographics	Frequency	Percentage
Gender		
Male	179	82
Female	40	18
Age		
Below 30	39	18
30-40	70	32
40-50	57	26

More than 50	53	24
Qualification		
BBA	38	17
B. Tech	49	23
MBA	49	22
M. Tech	35	16
Other	48	22
Years of experience		
Less than 5 year	45	21
5 - 8 years	48	22
9 -12 years	57	26
More than 12 years	69	31

Table – 3: Demographic profile of the questionnaire respondents

As per the above table, out of total respondents, majority of the respondents were having the degree of Bachelors in Technology or Masters in Business Administration. This shows their high capability of managing the operations and handling the large team along with applying the technical and logical knowledge to the operations. Overall, out of total respondents more than 38 percent of the respondents were postgraduates. Around 22 percent of the respondents are having other qualifications such as Diploma, B. Com and many more.

In terms of years of experience, majority of the respondents were having experience of minimum 5 years at least. There are around 79 % of the respondents who were having more than five years

of experience. 31% of the respondents were having more than 12 years of experience in this field.

Profile of the Respondents

Respondents Profile	Frequency	Percentage
Project Manager	63	29
Business Development Manager	66	30
Financial Controller	29	13
Other Professional Manager	61	28

Table – 4: Occupational profile of the questionnaire respondents

Out of total respondents, majority of the respondents (30%) were holding the position of Business Development Manager in their organizations followed by project managers whose percentage is 29%. About 13% of the respondents were holding the position of financial controller in the organization. Rest 28% of the respondents was holding various different profiles such as testing engineering, operation manager, supply chain manager, sales and marketing manager and many more.

Type of organization

Type of organization	Frequency	Percentage
Construction	47	21
Hospitality	52	24
Communication	27	12

Energy	43	20
Other	50	23

Table – 5: Organizational profile of the questionnaire respondents

When respondents were asked about the type of their organization, majority of the respondents were from the construction and hospitality sector. Around 24% of the respondents were from the hospitality sector and 21% of the respondents were from the construction sector followed by energy sector (20%). The remaining 23% of the respondents were from some other sectors like food, petrochemical, oil etc.

Number of projects per year

Number of projects per year	Frequency	Percentage
Less than 10	53	24
10 – 30	59	27
30 – 50	56	26
More than 50	51	23

Table – 6: Annual projects load of the questionnaire respondent’s organizations

When respondents were asked about the number of projects handled by them every year in response to this, majority of the respondents stated that their organization handled average 10-30 projects every year. 26% of the respondents stated that their organization handled 30- 50 projects every year while 23% of the respondents stated that their organization handled more than 50 projects every year. It means majority of the organizations handled more than 10 projects every year in UAE.

Reliability Test

To test the reliability of the collected data, Cronbach's Alpha Coefficient was calculated for each variable with the help of SPSS Tool. The resulting α coefficient of the reliability ranges from 0 to 1. In general, α score of more than 0.7 is considered acceptable and indicates good internal consistency of the items in the scale.

The below tables are showing the reliability value of instruments used for measuring the six independent variables and one dependent variable. The Cronbach Alpha Coefficients for all the variables are above 0.7. So, it can be interpreted that constructs used for measuring the variables are reliable.

Involvement of Senior Manager

Reliability Statistics

Cronbach's Alpha	N of Items
.869	3

Table – 7: Reliability test for V1

Project Manager's Engagement

Reliability Statistics

Cronbach's Alpha	N of Items
.879	3

Table – 8: Reliability test for V2

Governance

Reliability Statistics

Cronbach's Alpha	N of Items
.850	3

Table – 9: Reliability test for V3

Unavailability of Resources

Reliability Statistics

Cronbach's Alpha	N of Items
.730	3

Table – 10: Reliability test for V4

Organizational Culture

Reliability Statistics

Cronbach's Alpha	N of Items
.824	3

Table – 11: Reliability test for V5

Changing External Environment

Reliability Statistics

Cronbach's Alpha	N of Items
.835	3

Table – 12: Reliability test for V6

Management towards Innovation

Reliability Statistics

Cronbach's Alpha	N of Items
.907	3

Table – 13: Reliability test for V6

Correlation Analysis between the Dependent and Independent Variables

Correlation analysis is a technique for investigating the relationship between the two quantitative, continuous variables and it also measures the strengths of the association between the two variables. This study prepared a total of six hypotheses to measure the level of relationship of the five independent variables with one dependent variable.

Correlation between the involvement of senior managers and project portfolio management success

H1 asserted that the involvement of senior managers has positive relationship with the project portfolio management success.

Table 14: Correlation: The involvement of senior managers and project portfolio management success**Correlations**

		Project portfolio management towards the adoption of innovation	The involvement of senior managers
Project portfolio management towards the adoption of innovation	Pearson Correlation	1	.823**
	Sig. (2-tailed)		.000
	N	218	218
The involvement of senior managers	Pearson Correlation	.823**	1
	Sig. (2-tailed)	.000	
	N	218	218

** . Correlation is significant at the 0.01 level (2-tailed).

The above table shows the relationship between the two variables named the involvement of senior managers and project portfolio management success. The analysis demonstrated that there is a positive correlation between the two variables named the involvement of senior managers and project portfolio management success and the relationship is significant ($r = 0.823$, $n = 218$, $p < 0.01$). Hence, null hypothesis is rejected and the alternate hypothesis is accepted. The value of the coefficient is close to 1. It shows very strong linear relationship between the variables “involvement of senior managers” and “project portfolio management success”. Thus, it indicates a very strong positive correlation, suggesting the level of relationship as very strong. It means the involvement of the senior managers always improve the performance of the project portfolio management and bring innovation (Salkind, 2010).

Correlation between the project portfolio manager's engagement and project portfolio management success

H2 asserted that greater the project portfolio manager's engagement in PPM, the better prospects for the success of PPM.

Table 15: Correlation: The project portfolio manager's engagement and project portfolio management success

Correlations

		The project portfolio manager's engagement	Project portfolio management towards the adoption of innovation
The project portfolio manager's engagement	Pearson Correlation	1	.886**
	Sig. (2-tailed)		.000
	N	218	218
Project portfolio management towards the adoption of innovation	Pearson Correlation	.886**	1
	Sig. (2-tailed)	.000	
	N	218	218

** . Correlation is significant at the 0.01 level (2-tailed).

The above table shows the relationship between the two variables named the project portfolio manager's engagement and project portfolio management success. The analysis demonstrated

that there is a positive correlation between the two variables named the involvement of the project portfolio manager and project portfolio management success and the relationship is significant ($r= 0.886$, $n=218$, $p<0.01$). Hence, null hypothesis is rejected and the alternate hypothesis is accepted. The value of the coefficient is close to 1. It shows very strong linear relationship between the variables “project portfolio manager’s engagement” and “prospects for project portfolio management success”. Thus, it indicates a very strong positive correlation, suggesting the level of relationship as very strong. It means the involvement of the project portfolio manager significantly improves the performance of the project portfolio management and brings innovation (Salkind, 2010).

Correlation between the Governance in the project portfolio management and success of project portfolio management during the adoption of innovation

H3 asserted that governance in the project portfolio management is positively related to the success of project portfolio management during the adoption of innovation

Table 16: Correlation: Governance in the project portfolio management and success of project portfolio management during the adoption of innovation

Correlations

		Project portfolio management towards the adoption of innovation	Governance in the project portfolio management
Success of project portfolio management during the adoption of innovation	Pearson Correlation	1	.789**
	Sig. (2-tailed)		.000

	N	218	218
Governance in the project portfolio management	Pearson Correlation	.789**	1
	Sig. (2-tailed)	.000	
	N	218	218

** . Correlation is significant at the 0.01 level (2-tailed).

The above table shows the relationship between the two variables named the governance in the project portfolio management and success of project portfolio management during the adoption of innovation. The analysis demonstrated that there is a positive correlation between the two variables named the governance and project portfolio management success and the relationship is significant ($r = 0.79$, $n = 218$, $p < 0.01$). Hence, null hypothesis is rejected and the alternate hypothesis is accepted. The value of the coefficient is 0.79, which is close to 1 so it shows strong strength of the linear relationship between the variables “governance in the project portfolio management” and “success of project portfolio management” during the adoption of innovation. Thus, it indicates a strong positive correlation, suggesting the level of relationship as strong between the two variables. It means the effective governance in the project portfolio management improves the performance of the project portfolio management and brings innovation (Salkind, 2010).

Correlation between the Unavailability of resources and adoption of innovation in the project portfolio management success

H4 asserted that unavailability of resources influence the project portfolio management towards the adoption of innovation in PPM.

Table 17: Correlation: The Unavailability of resources and adoption of innovation in PPM**Correlations**

		Project portfolio management towards the adoption of innovation	Unavailability of resources
Project portfolio management towards the adoption of innovation	Pearson Correlation	1	.571**
	Sig. (2-tailed)		.001
	N	218	218
Unavailability of resources	Pearson Correlation	.571**	1
	Sig. (2-tailed)	.001	
	N	218	218

** . Correlation is significant at the 0.01 level (2-tailed).

The above table shows the relationship between the two variables named the unavailability of resources and adoption of innovation in PPM. The analysis demonstrated that there is a positive correlation between the two variables named the unavailability of resources and adoption of innovation in PPM and the relationship is significant ($r= 0.571$, $n=218$, $p<0.01$). The positive r value indicates a positive relation between the variables. Hence, null hypothesis is rejected and the alternate hypothesis is accepted. The value of the coefficient is close to 0.5, it shows moderate linear relationship between the variables “unavailability of resources” and “adoption of innovation” in PPM. Thus, it indicates a moderate positive correlation, suggesting the level of relationship as moderate. It means the unavailability of resources in PPM moderately impacts the project portfolio management towards the adoption of innovation in PPM (Salkind, 2010).

Correlation between the Organizational culture and project portfolio management towards the adoption of innovation

H5 asserted that organizational culture influences project portfolio management towards the adoption of innovation.

Table 18: Correlation: The Organizational culture and project portfolio management success towards the adoption of innovation

Correlations

		Project portfolio management towards the adoption of innovation	Organizational culture
Project portfolio management towards the adoption of innovation	Pearson Correlation	1	.824**
	Sig. (2-tailed)		.000
	N	218	218
Organizational culture	Pearson Correlation	.824**	1
	Sig. (2-tailed)	.000	
	N	218	218

** . Correlation is significant at the 0.01 level (2-tailed).

The above table shows the relationship between the two variables named the organizational culture and project portfolio management success. The analysis demonstrated that there is a positive correlation between the two variables named organizational culture and project portfolio management success and the relationship is significant ($r= 0.824$, $n=218$, $p<0.01$). Hence, null

hypothesis is rejected and the alternate hypothesis is accepted. The value of the coefficient is 0.82, which is close to 1, so it shows very strong linear relationship between the organizational culture in the project portfolio management and success of project portfolio management during the adoption of innovation. Thus, it indicates a very strong positive correlation, suggesting the level of relationship as very strong between the two variables. It means the effective organizational culture in the project portfolio management significantly improves the performance of the project portfolio management and brings innovation (Salkind, 2010).

Correlation between the changing external environment and project portfolio management success

H6 asserted that changing external environment influences project portfolio management towards the adoption of innovation.

Table 19: Correlation: The changing external environment and project portfolio management success

Correlations

		Project portfolio management towards the adoption of innovation	Changing external environment
Project portfolio management towards the adoption of innovation	Pearson Correlation	1	.800**
	Sig. (2-tailed)		.000
	N	218	218
Changing external environment	Pearson Correlation	.800**	1
	Sig. (2-tailed)	.000	

N	218	218
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** . Correlation is significant at the 0.01 level (2-tailed).

The above table shows the relationship between the two variables named the changing external environment and project portfolio management influence towards adoption of innovation. The analysis demonstrated that there is a positive correlation between the two variables named the changing external environment and project portfolio management influence towards adoption of innovation and the relationship is significant ($r= 0.800$, $n=218$, $p<0.01$). Hence, null hypothesis is rejected and the alternate hypothesis is accepted. The value of the coefficient is close to 1. It shows strong influence of the changing external environment variables towards the adoption of innovation in the project portfolio management. Thus, it indicates a strong positive correlation, suggesting the level of relationship as strong. It means the changing external environment variables such as economic, political, social and environmental variables strongly influence the PPM to bring innovation (Salkind, 2010).

As per the above analysis, it can be stated that out of six independent variables, all the six variables positively influence the Management of project portfolio towards adoption of innovation. These six variables are senior manager involvement, engagement of the project portfolio manager, governance, organization culture, unavailability of resources and the changing external environment.

CHAPTER 6- Discussion of Results

The report was relating to the project portfolio management (PPM) innovation and influence of some variables on the success of the PPM innovation. This report indicates that how the project portfolio fosters innovation within the company (Hassan & Ilyas, 2014). PPM is a very effective and efficient tool for the business as on the basis of this, the resource allocation is done within the company. It is regarded as the best innovative tool. PPM facilitates innovation process improvement in a number of ways. Firstly, by managing the portfolio of product and service offerings, second by offering the portfolio of development projects (seeing that all products/services start out as projects) and through resources (both people and money) allocation that support innovation activity (Killen, Hunt, & Kleinschmidt, 2008). Through the identification of the potential projects, the company can give its best. In order to have the right project at the right time, it is essential to have a good and efficient portfolio manager to foster innovation (Ajjan, Kumar, & Subramaniam, 2008).

The portfolio manager aligns or streamlines the working of the company. It maintains the equivalence between the various units of the portfolio. Furthermore, it is the responsibility of the project manager to provide the right information to the stakeholders of the company. Thus, some major roles and responsibilities of the portfolio manager are: Modeling and structuring the key or main strategic factors or variables of the industry. Defining and examining the various characteristics that needs to be considered by the company. It is the responsibility of the project manager to weigh the attractiveness and score the attractiveness level (Ajjan, Kumar, & Subramaniam, 2008). Thus, it can be said the portfolio management is a strategic approach. It has been observed that the portfolio management is used for multiple purposes within the organization. Some of these purposes are customer satisfaction, suppliers' relations, revenue

growth, innovation, improved development cost, further it ensures sustainability and the employees' satisfaction.

In the selection of projects, PPM took innovative approach by going beyond 'the management of multiple projects' because its ultimate goal is to contribute to the 'overall welfare and success of the enterprise'. Under PPM, projects are evaluated in an innovative way by pointing out the needs of the projects, project status and performance of the projects. Finally, projects are piped with this innovative strategy by giving them ranking. In fact, the concept of PPM innovation is now considered strategic by the organizations, and it has been made strong criteria in the selection of projects. PPM Innovation has become a part of the organizational culture and is treated as a high level objective on which competitive advantage depends (Levine & Wideman, 2005).

Further, through the various research projects, it has been revealed that there are many issues within the business, which can be handled effectively if the right PPM innovation techniques are used. The PPM also facilitates the innovation.

Innovation can be defined as the creation of new or updated products or services that are essential for the long- term success of any organization. The innovation process is directly related to the project portfolio management as the goals of project portfolio management such as focus on right projects balance and strategic alignment provide a structured setting for the application of tools and techniques of portfolio selection such as financial methods, bubble diagrams, strategy, scoring models, etc. This enables the selection of projects at 'the right quality, for the right price and at the right time' (Cooper, Edgett, & Kleinschmidt, 2001).

The diffusion of innovation theory was developed by E.M. Rogers in 1962. This theory states diffusion is the spread of ideas among groups of people. Diffusion of innovation is the adoption

of a new idea, product or service by the members of a given culture. The four main elements of diffusion of innovation theory are- innovation, communication channels, time and social system. The diffusion of innovation is essentially a social process in which subjectively perceived information about a new idea is communicated. The key to adoption is that the people must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. This theory has been used successfully in many fields including communication, public health, agriculture, criminal justice, social work, and marketing (Rogers, 1983).

On the basis of the analysis of the results in the previous chapter, it is found that the results were quite diverse as the respondents belonged to various different sectors such as energy, construction, communication hospitality and others. Majority of the respondents are having around 10-30 projects per year. Further, the results of the correlation analysis revealed that when the senior managers are involved within the project related to PPM there are chances of higher performance and innovation in the PPM. Thus, it can be said that the project portfolio success and the senior manager involvement is positively correlated and foster innovation. With the right PPM processes and solution, the managers will not only have a holistic view of the entire innovation portfolio, but also it will include new ideas, in-market product performance and current development projects in order to support better decision- making, also at the same time it will also be better able to communicate strategy and priorities to all levels of business (Hassan & Ilyas, 2014).

Further, it was evaluated that the more the project portfolio manager's engagement in PPM, the better prospects for success of fostering innovation in PPM. The greater engagement of the managers in the PPM is related to the empowerment of the duties. In this case, manager has the liberty to use the resources in their own way and come up with some new ideas and ways to

perform the job. On the basis of this it can be stated that the more liabilities given to the managers to perform their duties or their team as per their choice, the more they show their creativeness to come up with innovations (Jonas, 2010).

Further, the study results support the strong governance in the project portfolio management (PPM). In short, better governance and execution of the Product Portfolio validate the right PPM solution to enable organizations to prioritize the right opportunities, develop the right products or services in a consistent, timely and predictable manner, by using the right resources. This helps the organizations to grow new product revenues, maximize ROI and ultimately accelerate time to value. This is ultimately called as achieving innovative products through PPM (Beringer, & Jonas, 2013). Thus, governance is very important part it provides right direction to the company. The same has been supported by Biesenthal and Wilden (2014) as according to them, the governance in project portfolio management is very important while ensuring successful delivery of the projects by innovating new strategies in PPM.

Further, correlation was calculated within the unavailability of resources and adoption of innovation in the project portfolio management success. In this case also, the null hypothesis has been rejected and the alternate hypothesis has been accepted. It means as per the study results, if the projects under the PPM is facing the issue of resource unavailability then, it force the managers or the management to find the other ways or other resources that can fulfill the need of the unavailable resources. This leads the team members to find alternative ways to complete the job and this ultimately leads to innovation of the new strategies to complete the job. As per the Disu (2013), scarcity of resources force the managers to adopt some new approach that can allocate the resources in such a way that, work does not get hampered and maximum tasks are covered under it (Disu, 2013).

Further, there is a positive correlation within the Organizational culture as well as project portfolio management towards the adoption of innovation. Also, as the external environment changes the success rate of the project portfolio management also changes. If the external environmental factors such as political, economical, environmental and societal suddenly change, it creates challenges for the management team to complete the projects. Under PPM, in a case of occurrence of any challenge from the external environment variables, then it can adversely hamper the current growth of the projects under PPM. To overcome these external challenges, the design of the projects are redesigned and various actions are taken on the basis of the current situation. Every situation is different from the previous one and hence, no predefined solution works so, new plans and methods are proposed to combat the situation and this inculcates innovation.

CHAPTER 7- Conclusion

The report is in relation to the portfolio management and its role in the innovation of the company. The major research objectives of the report were to identify the role as well as importance of the portfolio management (PM) in managing and supervising the large projects in context to the United Arab Emirates. Another research objective is to identify that whether there is a positive relationship within the innovation and the portfolio management or not. Last research objective is to identify that whether portfolio management helps in fostering the innovation within the company or not. Various research variables that have been taken for the report are effects of working experience and culture of the respondents in the portfolio-related decisions, second variable, is PPM and product/service innovation, third variable is PPM performance measures and new product and services success measures. Theoretical and conceptual framework of the company is defined on the above variables. Extensive literature review was conducted so as to collect abundant and right data on the Project Portfolio Management. Initially, a deep introduction was given on the PPM, which portrays importance and need of the PPM within the organization. In order to have the relevant results for the report both primary data as well as the secondary data have been used. On the basis of the primary data and secondary data, the research questions have been answered. Secondary data have been collected through the literature review. Previous research reports papers were examined to answer the research questions. Research design of the report is based on the three designs that are qualitative research approach, quantitative research approach, as well as mixed research approach. Best research design has been selected so as to provide the relevant results to the research questions. The deductive research objective has been used within the report. Further, in the report six hypotheses have been framed, the framed hypothesis has been tested on the basis

of the data that have been collected through the survey. Hypothesis testing has been done so as to evaluate the positive and negative relation between the dependent variable and the independent variables. Random sampling technique has been selected so that there is no biasness in selecting the sample. The entire null hypothesis has been rejected and the alternate hypothesis has been accepted.

Thus from the above report it can be said that there are various factors which affect the success of the project portfolio management in fostering innovation. Some of these factors are external environment factors, it has been revealed for the above report that changing external environment is having a positive impact on the success of the project portfolio management. Further, it has been revealed that the organizational culture also affects the adoption of innovation in the project portfolio management. It has been revealed that it is necessary that there should be the availability of the resources. It can be said that innovation within the project portfolio management can be achieved only when there is optimum utilization of the available resources. Resources can be utilized optimally but it is essential to have the availability of the resources. Further, it portrays that suggestion of the senior persons should always be welcomed. The senior person within the project facilitates working and makes sure that project is moving in the right direction. Project management is regarded as a tool which ensures that the resources have been allocated effectively. In the present scenario, many different companies are using formal and informal methodologies for the business, thus the portfolio management is the critical part of the company. In order to drive the strategic initiative, it is essential that right decisions have been taken at the right time. Innovation is regarded as the key enabler for the company's strategy. Innovation is regarded as the key or main idea behind shaping the corporate life as well as it helps the companies or organizations to adopt and implement various types of strategic options.

Further, it supports or helps the company to reduce or mitigate the total amount of cost relating to production or execution within the company. Further, it enhances or increases the income avenues of the company; further, it maintains and sustains the efficient and effective operating systems.

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Appendix

Survey Questionnaire

Dear Sir/Madam,

As I finalize my Masters Degree in Project Management from The British University in Dubai (BUiD), I am analyzing the role of Project Portfolio Management in fostering Innovation within the context of UAE organizations. I would greatly appreciate your support in devoting some of your valuable time for filling the attached questionnaire survey, during which the identification of the relationship between the portfolio management and innovation could be addressed.

I would like to ensure that your name will be treated confidentially and will not be published in my work.

Thanking you in advanced and looking forward to your participation.

Sincerely Yours,

Khaled M. Hannoush
M. +971555876145
Email: khaled2000qa@yahoo.com

Demographics Questions

1. Gender
 - a) Male
 - b) Female
2. Age
 - a) Below 30 years
 - b) 31 - 40 years
 - c) 41 - 50 years
 - d) Above 50 years

3. Years of Experience

- a) Less than 5 years
- b) 5 - 8 years
- c) 9 - 12 years
- d) More than 12 years

4. Educational Qualification

- a) BBA
- b) B. Tech
- c) MBA
- d) M. Tech
- e) Other

5. Job Profile

- a) Project Manager
- b) Business Development Manager
- c) Financial Controller
- d) Other Professional Manager

6. Type of Organization

- a) Construction
- b) Real-estate
- c) Communication
- d) Energy
- e) Other

7. Number of projects per year
 - a) Less than 10
 - b) 10 - 30
 - c) 30 - 50
 - d) More than 50

Conceptual Questions

Independent Variables

- **Involvement of senior managers**
 1. Senior managers are involved deeply in the projects.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 2. The adoption of innovation is affected positively with the involvement of senior managers.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree

3. The senior managers pay attention to the aspects such as communication and building relationship with the stakeholders.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

• **Portfolio manager's engagement**

4. The project portfolio manager has a crucial role in the projects.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

5. Project portfolio manager helps in fostering innovation with the help of different management innovation practices.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

6. The project portfolio manager coordinates effectively with the line managers and senior managers.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

- **Governance**

7. The importance of project governance is high.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

8. Project governance helps in taking decisions regarding the resources that have to be utilized in the project.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

9. Project governance helps in fostering innovation.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

- **Unavailability of resources**

10. Unavailability of the resources is one of the biggest problems of the projects.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

11. Innovation, new methods and strategies can help in allocating the resources adequately.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

12. Senior managers and line managers have to implement new practices for preventing the unavailability of resources.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

- **Organizational culture**

13. The adoption of innovation in the projects is dependent on the culture of the organization.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

14. The culture of the organization should be adaptive and flexible for successful project management.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

15. Organization culture has a direct impact on the project portfolio adoption.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

- **Changing external environment**

16. The complexities of the external environment have increased in the context of the project portfolio management.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

17. Project management techniques are useful for managing the external environment complexities.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

18. Innovation in project portfolio management will help in responding effectively to the external environment complexities.
- a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree

Dependent variable

- **Management of project portfolio towards adoption of innovation**

19. Innovation is the important part of project portfolio.
- a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
20. Innovation will improve the overall quality and performance of the projects.
- a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree

21. Senior managers, line managers and portfolio managers have a crucial role in adopting the innovation in the projects.

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree