

# Project Management versus Operations Management: A Comparative Study

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## Abstract

The two fields of operations management and project management are widely practiced in industry. However, to the best of the authors' knowledge, there exists no specific study that highlights the differences and/or similarities between the two in the understanding of the practitioners. Thus, this study is undertaken to identify and study the differences between project management and operations management from the perspectives of practitioners in industry at the Sultanate of Oman. This paper aims to have a better and a deeper understanding on each field's definition, characteristics, responsibilities and key personnel roles and required skills. Accordingly, a set of hypothesis were drawn from the literature and a specific survey was designed to test these hypothesis. The survey is then distributed to practitioners in Oman and results from 100 respondents were collected, analyzed and discussed. The study has revealed that indeed there exists a strong *Alliance* between project management and operations management. This Alliance may cause practitioners to mix between the two fields.

## Keywords

Project management, Operation management, Project manager, Operations manager

## 1. Introduction

Travelling two different paths that leads to the same destination may be a suitable way of describing project management and operations management, yet, a logical concern will raise regarding the differences between both paths. Project management and operations management are mutually related to each other, however, level of interaction and intersection between them depends on the perspective of how things are seen or defined. In a very broad sense, though simple, projects focus on deliverables while operations care about the processes of making deliverables in mass (Moore, 2015). According to Kwak and Anbari (2009), when the interaction level of both fields are evaluated based on academics and practitioners it may be revealed that the level of alliance between project management research and operations research disciplines are ranked second among the highest disciplines allied with project management.

This study seeks to identify and discuss the differences between project management and operations management from several different perspectives in order to have a better & deeper understanding on each field's definition, characteristics, responsibilities and key personnel roles and required skills.

The rest of the paper is organized as follows. Section 2 presents the literature review. Proposed Hypotheses are introduced in Section 3. Research Methodology and the collected Results and Findings are covered in Sections 4 and 5, respectively. Section 6 is dedicated for the discussion and the interpretation of the research results. Finally, the conclusions and future work are presented in Section 7.

## 2. Literature review

### 2.1 Definition

There has been a long debate in the management education community as to whether “project management” is a practice or an academic discipline (Kwak and Anbari, 2009). However, the purpose of the knowledge area does not affect the general concept of the purposes. The most popular body of project management – Project management institute (PMI) defined project management, as “*The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements*” (PMI, 2017). For better understanding, it is important to know what exactly meant by a *project*. PMI refer to it as “*A temporary endeavor undertaken to create a unique product, service or result*” (PMI, 2017).

Scholars, practitioners, and academic and professional societies have different definitions and interpretations of the subject "project management" and it is necessary to take into consideration their viewpoint adequately. For example, in discussing project management, behavioral scientists may think of the matrix organization or emotional intelligence, operational researchers may think of network analysis, queuing theory, or optimal plant design, and strategy scholars may think of strategic alliances among different organizations during project execution (Kwak and Anbari, 2009).

On the other hand, in a very general and board concept, operations is thought of as a run of related activates to produce a service or a product. In specific, operations management (OM) is the set of activities that creates value in the form of goods and services by transforming inputs into some desired outputs (Heizer and Render, 2011). OM disciplines applies to providing services such as hospitals as well as to producing goods as in factories.

### 2.2 Characteristics

It is sensible that Operations management & Operations researches of the top allied disciplines that have strong interest and popularity in project management (PM) research. Scholars and practitioners have keen interest in applying PM principles, tools, techniques, and concepts to organize and manage resources for maximizing profit, minimizing cost, and supporting the overall strategy of the organization (Kwak and Anbari, 2009). Nevertheless, project and operation each have some certain distinguishable characteristics and responsibilities that could be highlighted.

A project is usually characterized by: a) Relatively short lifetime, with a clearly defined start and end date, b) Well-defined and static budget for the entire duration of the project, usually with pre-defined items, and c) People temporarily allocated to the project (Frisanco, and Anglberger, 2008).

Alternatively, an operation is usually characterized by: a) Long-term (potentially unlimited) and continuous work, b) A long-term budget with costs only partially previously defined or estimated; a cyclical budget and cost management, and c) People permanently allocated for a long time (Frisanco, and Anglberger, 2008).

### 2.3 Responsibilities

Project Management tools and techniques in the R&D field are applied and implemented to complete complex projects successfully. For example, in the field of construction people learn and implement planning, managing, and controlling of engineering construction projects to meet the time, budget, and specifications. However, in the production field people learn and implement production planning, scheduling and quantitative methods and apply them to the manufacturing systems to achieve higher productivity (Kwak and Anbari, 2009).

Turner and Ledwith (2009) stated that the roots of modern PM have come from quantitative research in planning-oriented techniques as well as an application of engineering sciences and optimization theory. Conversely, Operations management’s importance as a professional discipline undoubtedly was recognized since the ages of the industrial revolution, when mass production and process efficiency became the new paradigms of manufacturing (Frisanco, and Anglberger, 2008).

Recently, Anand and Gray (2017) concluded that operations management handles various strategic issues including determining the size of manufacturing plants and project management methods, and implementing the structure of information technology networks. Other operational issues include the management of inventory levels, including work-in-process levels and raw materials acquisition; quality control; materials handling; and maintenance policies. Furthermore, operations management involves studying the use of raw materials while ensuring minimal waste occurrence.

## 2.4 Key personnel roles and required skills

The existing cast of operations and project managers has more or less formed itself based on the needs and nature of the traditionally prevailing projects of the past, namely research and development activities, the ramp-up and optimization of production processes, and the installation and commissioning of complex industrial investment goods, i.e. the delivery of turnkey infrastructure projects (Frisanco, and Anglberger, 2008).

Roles and required skills of personnel in project management or operations management fields are in fact determined by the responsibilities and the nature of work. Earlier studies (Frisanco, and Anglberger, 2008, Silvius, 2017, Meng, and Boyd, 2017)., are reviewed to obtain the key roles and skills required to present in project managers & operations managers, in order to study them further based on the survey respondents. Review of earlier studies led to the following:

### 2.4.1 Project Managers

The designation “project manager” is currently neither a unified nor a “trademarked” degree. Organizations like the PMI and the International Project Management Association (IPMA) have been implementing models for a project management certification, driven by their own perceptions and values, and proposing a multiple-tier hierarchy of various certifications levels of project management, according to project size and complexity. In-house certification programs introduced by many large enterprises should also be mentioned in this context (Frisanco, and Anglberger, 2008).

Project manager as described by PMI (2017), are organized, passionate and goal-oriented individual who understand what projects have in common, and their strategic role in how organizations succeed, learn and change.

Project managers are change agents. They make project goals their own and use their skills and expertise to inspire a sense of shared purpose within the project team. They have a broad and flexible toolkit of techniques, resolving complex, interdependent activities into tasks and sub-tasks that are documented, monitored and controlled. In addition, they are comfortable with change and complexity in dynamic environments.

Project managers mainly focus on the completion of the project as per agreed schedule and acceptable quality, with the cost being the least in priority. Nevertheless, the effort of project managers for internal relations management contributes to project team building and development. On the other hand, their effort for external relations management contributes to supply chain collaboration and external stakeholder engagement. Better internal and external environments create more opportunities to improve project performance and achieve project success (Meng, and Boyd, 2017).

### 2.4.2 Operations Managers

An operations manager is a senior role, which involves overseeing the production of goods and/or provision of services. It is an operations manager's job to make sure an organization is running as well as it possibly can, with a smooth efficient service, that meets the expectations and needs of customers and clients. Operations managers face different challenges from traditional project managers (Frisanco, and Anglberger, 2008).

According to Frisanco, and Anglberger (2008) Operation Managers apply management process such as planning, organizing, staffing, leading and controlling to the decisions they make in operations management function. Major decision areas for operations managers includes; a) Managing Quality, b) Process and capacity design, c) Human resources and job design, d) Supply chain management, e) Inventory, material requirements planning, f) Intermediate and short term scheduling.

## 3. Hypothesis

Based on the literature, the following set of hypothesis is drawn in order to test the general understanding of the practitioners related to the differences and/or similarities between Project Management and Operations Management:

*Hypothesis 1: There is strong Alliance between project management and operations management.*

*Hypothesis 2: Project management is defined as the field of theoretical knowledge that suggests tools and techniques leads to execute projects more effectively and efficiently*

*Hypothesis 3: Operations management is defined as the run of related activities to produce service or product*

*Hypothesis 4: Generally, product/service design and test can be considered as a project phases while the production is considered as an operational work*

*Hypothesis 5: Project management and operations management has certain distinguishable characteristics*

*Hypothesis 6: Project manager and operations manager have differentiable roles and skills.*

#### **4. Research Methodology**

Being comparative study, obtaining information from variant resources shall strengthen the results validity. Detailed review and study of literature spotted the light on the main differences between project management and operations management. A survey instrument is designed based on the findings from the literature and earlier conducted studies discussing related topics on each of the both fields. Survey questions design went through several processes. Initially, authors drafted a set of questions aims to investigate respondent's opinions on the studied perspectives of comparison. Final set of questions of the survey developed after consultation with several experienced researchers and practitioners as their comments and advices incorporated in the initial draft for better structure, readability, clarity, and completeness.

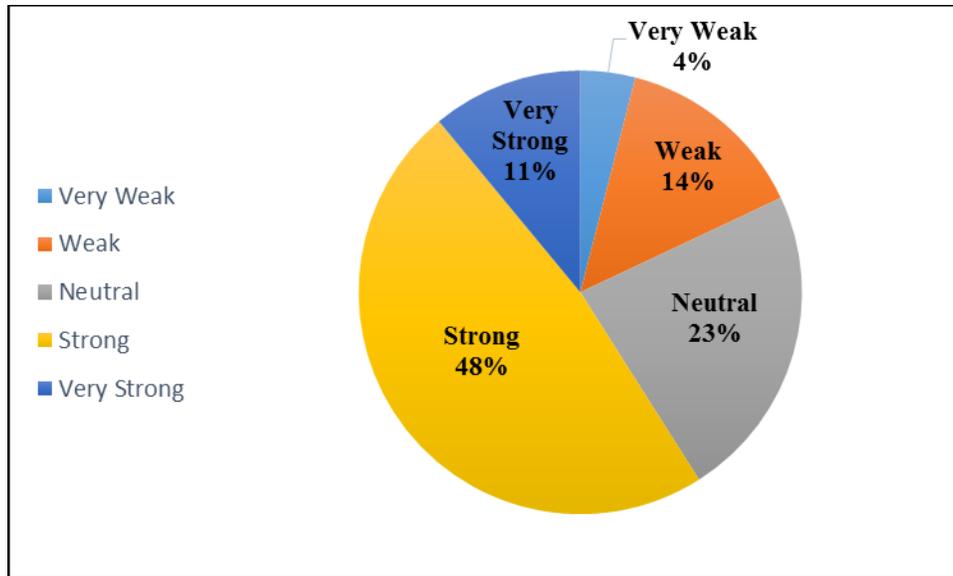
Data collection method based on spreading the survey to the maximum possible number of people working or have worked in related fields to project management and/or operations management in variant industries. The first section of the survey asks respondent for their years of experience and if s/he is working or have worked in project management or operations management field. This part is considered as a qualifying part of the survey aimed to analyze the responses based on the background of respondents categories besides the general analysis as an overall. The second part of the survey contains specific questions aiming to test the hypothesis of this study.

However, it must be noted as this stage that this research had limited time for data collection, and hence the survey contained a specific set of options for respondents to choose from. As this study is considered as an initial study meant to measure the level of awareness among practitioners at the Sultanate of Oman, selecting an appropriate sample size was challenging task. With the absenteeism of specific official body where an accurate estimate of the number of qualified practitioners working in the Sultanate's industry can be obtained from, authors had no other choice except to do some estimates of their own. According to the Tender Board of the Sultanate of Oman, there are around 6,193 companies registered with them varying from international to local companies with different categories and there is less than 120 companies listed in Muscat Securities Market. Therefore, authors find it very realistic to state that the total population size can be assumed no greater than 20,000. Hence, in order to achieve a maximum of pre-determined 9.8% satisfactory margin of error within 95% significance level, required number of respondents for this study is 100.

#### **5. Results and Findings**

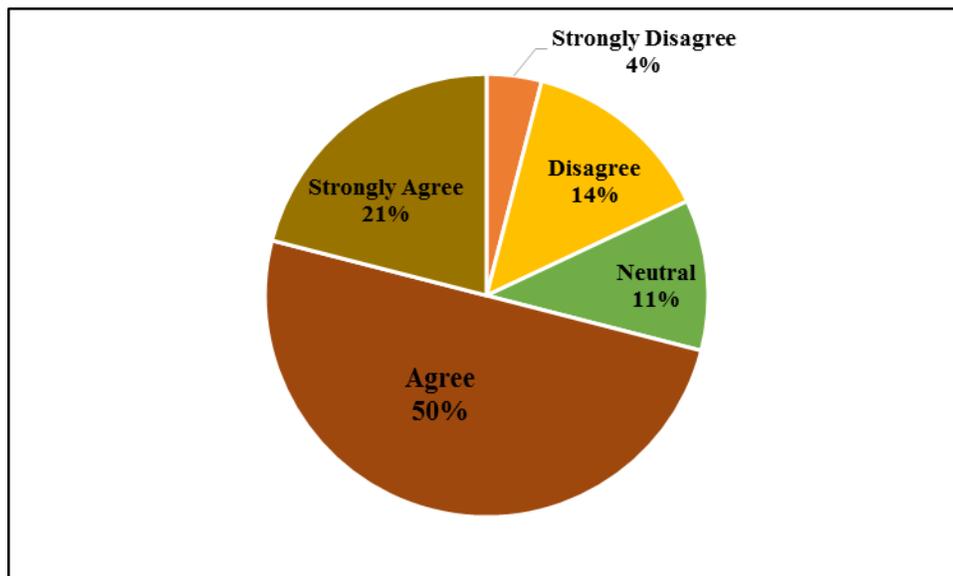
The survey was distributed among number of practitioners and results from 100 qualified respondents were analyzed. Based on the respondents' results, it is found that the 100 respondents consist from 55 respondents whom have worked or are working in project management field, 27 in operations management field and 18 have not directly worked in any of them yet they are academics either related to projects or operations organizations. The average years of experience of the total respondents found to be 6.94 years, which considered being senior level.

Figure 1 shows respondents opinions on the alliance level between project management and operation management. Respondents tend to agree that there is interaction between both fields. The data shows most responses sees that there is strong alliance level otherwise only few of them chose very weak or weak alliance.



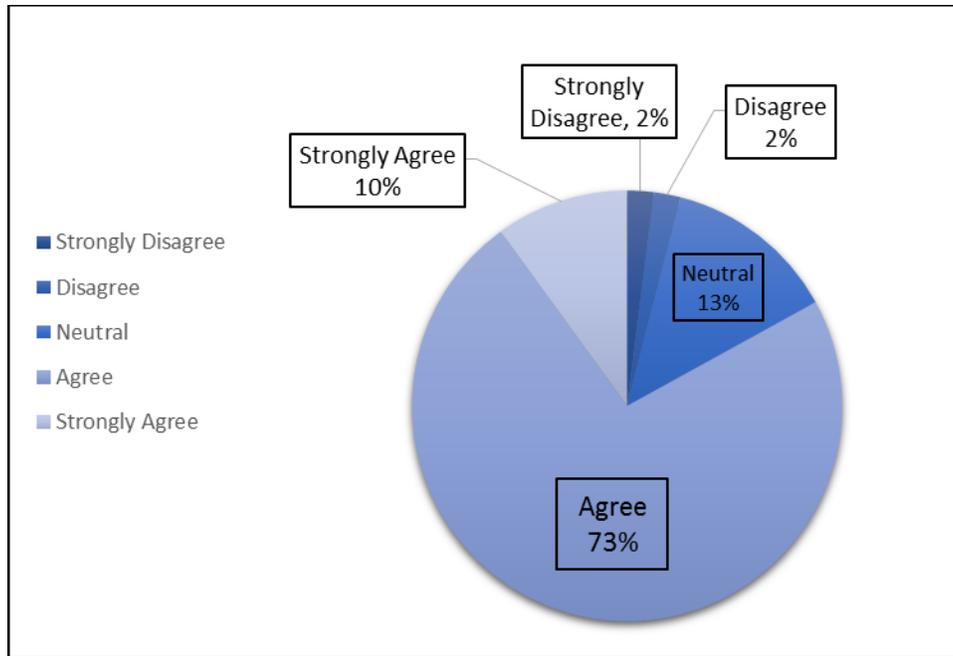
**Figure 1. Alliance level between project management and operation management**

Furthermore, more than two thirds of the respondents agreed to the definition of PM that states, “Project management is a field of theoretical knowledge that suggests tools and techniques leads to execute projects more effectively and efficiently”. Figure 2 shows total respondents agreement level.



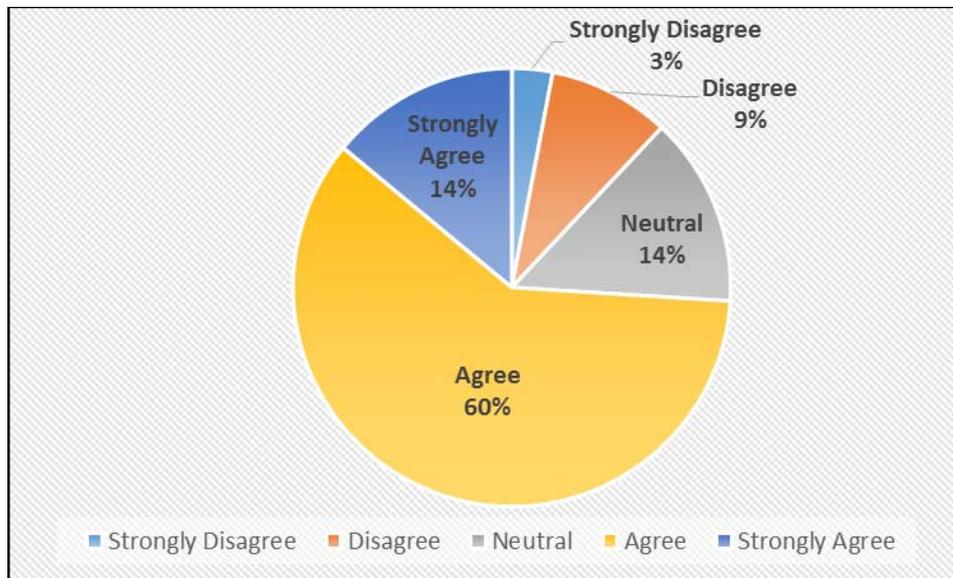
**Figure 2. Project management definition**

On the other hand, Figure 3 shows the agreement level of the respondents about defining operations management as “a run of related activates to produce service or product”. Figure 3 shows that respondents agreeing with the definition highly dominating their counter respondents.



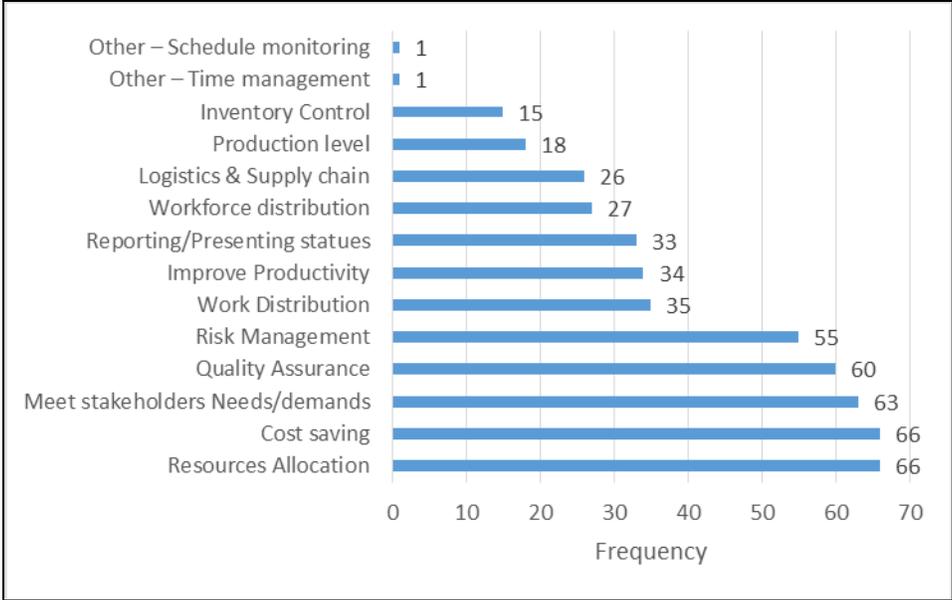
**Figure 3. Operations management definition**

In order to investigate the perception of the respondents about very general explanation of project management and operations management, a dedicated survey question asked them about their agreement level with the statement, “Product/service design and test can be considered projects phases while the production considered operational work”. It found to be that more than the half agreed as shown in detailed percentages in Figure 4.



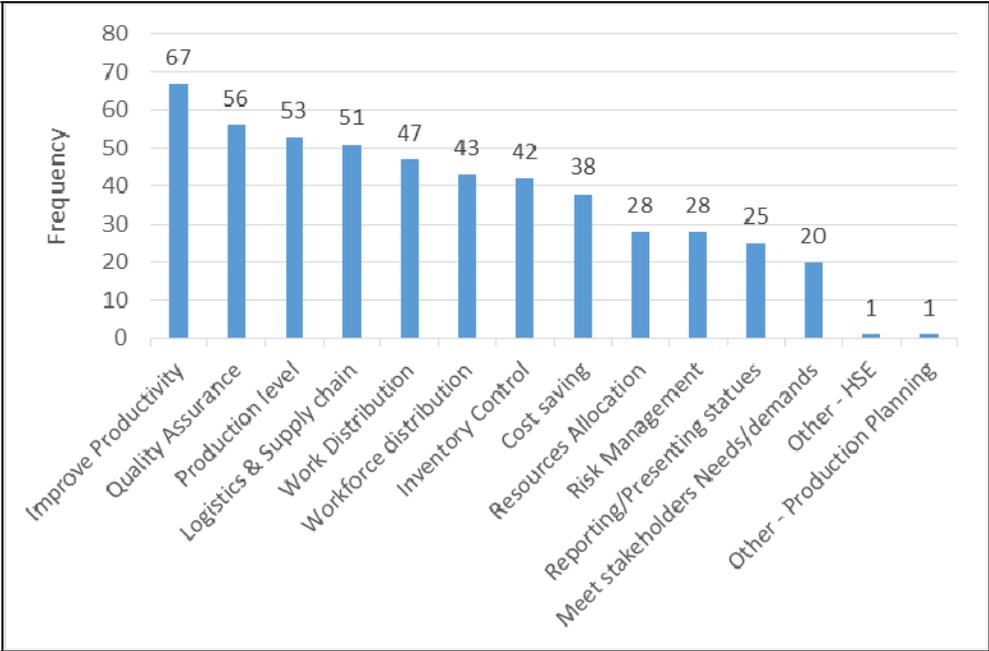
**Figure 4. Broad explanation of project management and operations management**

Figure 5 represents the frequency of studied characteristics/responsibilities as they found on the collected data. Respondents requested to select the five most important responsibilities of project management based on their experience and from their point of view.



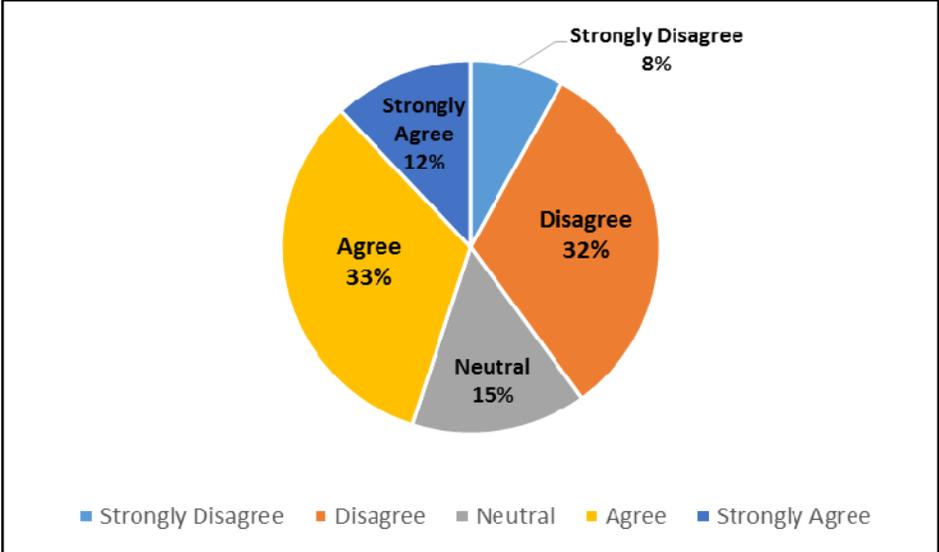
**Figure 5. Project management characteristics/responsibilities**

Respondents also asked to express their opinion on operations management responsibilities by selecting the five most important responsibilities based on their opinion. Figure 6 shows the frequencies of the selected responsibilities.



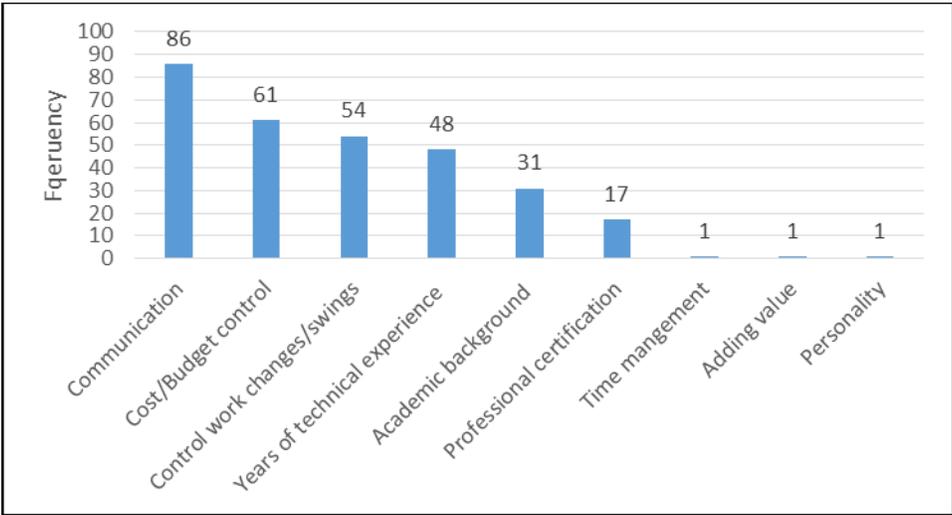
**Figure 6. Operations management characteristics/responsibilities**

Figure 7 shows the distribution of respondents based on their choices about their agreement level with the claim that project management is considered operations management little brother. Researchers generate this claim because most of universities and institutes still treat and consider project management as a part of their operations management or operations research programs.

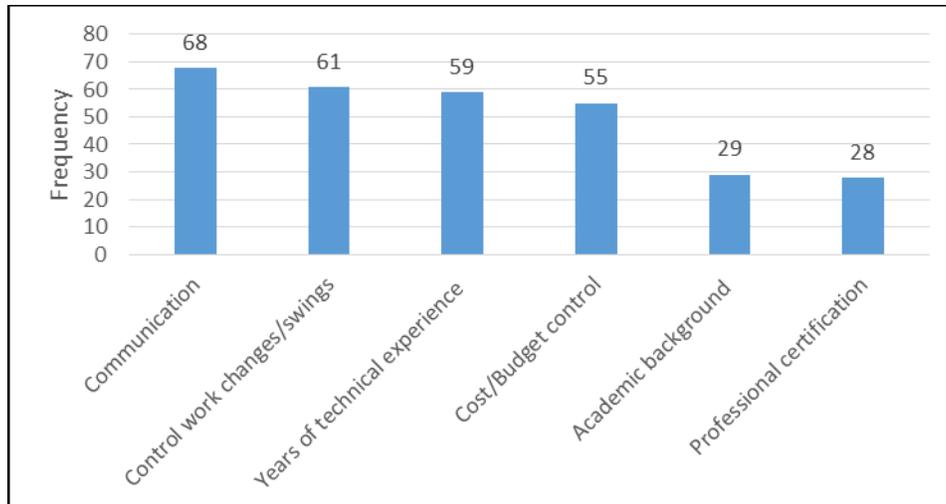


**Figure 7. Project management as operations management little brother**

Figure 8 and Figure 9 express the opinion of respondents about the three most important roles of project manager and operations manager, respectively.



**Figure 8. Project manager roles**



**Figure 9. Operations manager roles**

## 6. Discussion

Interaction level between the two compared fields found to be high, as 48% of the responses agreed that it is strong, besides 11% evaluated it alliance as very strong. We can understand from this that project management and operations management may be integrate-able to each towards their common goals or targets. This finding falls in-line with the finding of Kwak and Anbari (2009). This result verifies hypothesis 1.

Hypotheses 2 to 4 infer the definitions of each field and general explanation of them, results found to be strongly supporting with proposed hypothesizes. Hypothesis 2 supported by 71% against 18% disagreed, Hypothesis 3 got the highest support by 83% as well as the lowest disagree level of 4% only, while 74% agreed with hypothesis 4 against 12% disagreed. It is therefore obvious that operations management is more known and definable compared to project management, considering that projects properly defined by specialized accredited organization compared to operations that does not have the same.

Precedent hypothesizes verifications shows that project management and operations management are two different fields, yet they are interacting. Based on the results regarding the five most important characteristics for each field out of a set of twelve characteristics, it found to be that both fields does have only one mutual characteristic in their each top five. This reinforce the literature and verifies hypothesis 5.

Test of hypotheses 6 finds that key roles in both fields finds that there are two mutual roles. Communication is ranked first based on the results for both, project manager and operations manager. This emphasizing that being able to communicate effectively is a vital skill to be present in key responsible people, despite their field. Importance of communication is due to its contribution on the success and ease of delivering outputs by providing a medium of sending or receiving information. In addition, Control work changes/swings also found to be a mutual role as per respondents perspectives. This confirms that key personnel should be able to manage alternatives during production or execution. This requires them to be good decision makers as well.

## 7. Conclusions and Future Work

Comparison between project management and operations management is carried to study three aspects, namely, definition, characteristics and key personnel roles. Study used survey instrument results from 100 respondents directly & indirectly related to one of the fields. The results presented not only the differences between project management and operations management, but also the characteristics of each field, in addition to project manager and operations manager roles, which found to be having mutual required skills on the top three for each. Current research adds knowledge to the field discussing project management and operations management differences and similarities.

Extending the research to provide additional information about project management and operations management may consider including more characteristics/responsibilities to be studied. In addition, a deeper investigation of key personnel roles and the relation of the required skills with the outputs is necessary. Following different approach to indicate the ranking of characteristics importance could be useful to identify detailed level of importance of every

responsibility and the factors affecting them. Lastly, Targeting more respondents would be beneficial as well in order to minimize error percentage, also to widen the coverage of population, which positively affect results validity.

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