

# Towards the Achievement of Financial Optimization in Construction through Multi-Project Management

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**Abstract.** This is a conceptual paper discussing the application of Multi-Project Management (MPM) towards financial optimization of construction projects. This study first examines the use of MPM approach in the construction industry. Then, it discusses the financial optimization in projects through the best use of resources. Finally, it shows through a conceptual model that how MPM approach leads towards the financial optimization in construction projects. This work is part of an ongoing research where the objective is to develop a management framework based on Multi-project Management approach that allows optimal resource and financial planning in order to maintain sustainability aspects in Malaysian construction industry.

**Keywords:** Multi-Project Management, Financial Optimization, Project Programme Management

## 1. Introduction

The discipline of project management as defined by the Project management Institute (PMI) is the “application of knowledge, skills, tools, and techniques to project activities to meet project requirements” [1]. The underlying principal of project management is concerned with the management of individual projects in isolation. Its aim is to balance the specified parameters of cost, time and quality of a single project [2], [3]. Projects consisted of scheduled tasks which are executed for a limited period of time with a defined start and end date [4]. Although, projects are not only executed within a single organization (intra-organizational perspective) but usually are integrating partners from different organizations and organizational settings (inter-organizational perspective), this fact is rarely discussed in the relevant literature [5]. The rather technical discussion of project management methodology nearly completely omits aspects relevant for the management of inter-organizational projects such as partner identification, interface design, risk and success sharing and information interchange. Especially the evaluation of project success and the subsequent transfer of gained knowledge to other projects or to the respective organizations of the individual project members is a neglected aspect of the project management literature [6]. Therefore, in order to take the benefit of whole enterprise’s resources and as well as more economic results, organizations are adopting Multi-Project Management or Programme Management approach [7]. Multi-project management (MPM) as defined by PMI is “a collection of projects and other related work that are grouped together to facilitate effective management of that work to meet strategic benefits and objectives” [1]. MPM is also defined as “the management of a set of projects which are related directly or indirectly by their clients, business objectives, financing, resources, environment and operation” [8]. It provides a thorough insight in to project progress and make it more comprehensive for the senior management [9], [10]. In comparison to single-project management, MPM provides more efficient and appropriate use of resources as a result of better planning and co-ordination [11]. Organizations initiate multi-projects to deliver benefits and accomplish agreed-upon outcomes that are often affecting the whole organization. An effective MPM approach is based on three broad management themes i.e. benefit management, stakeholder management and program governance [11]. In MPM, while each project will retain its own scope and goals, all team are turned into the overall MPM

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goal. This MPM goal is what the multi-project manager, and the projects team strives to achieve under given specific schedule constraints and a set of predetermined benefits [12]. The majority of MPM studies and literature are based on information technology, pharmaceutical and telecommunication industry [13], [14], [15]. Although, MPM has been established in many sectors of economy, yet its understanding and practice in the construction sector is a still infancy stage [7]. In MPM, issues such as management, organization, financing, optimal resource utilization and realization of stakeholder needs are basic consideration [12]. Thus, the purpose of this study is to increase the knowledge about the integration of MPM approach towards financial optimization of construction projects.

## 2. Multi-Project Management

Multi-Project Management (MPM) is a discipline of management that is getting a constant attention from the researchers in past years. It is also known as Programme Management. MPM or Programme Management is defined as “the centralized coordinated management of a programme (i.e. a group of related projects or similar works) to achieve the programmes strategic benefits and objectives” [12]. MPM may optimize schedule across the programme, deliver incremental benefits, as well as enable staffing to be optimized in the context of the overall programmes’s needs. In MPM the projects may be interdependent due to the collective capability or they may share common features such as clients, customers, vendors, technology and resources [12]. Researchers have highlighted that MPM or programme create value by improving the management of projects in isolation, especially where the working environment is not only made up of a many of small projects, but also where integration of projects is crucial in terms of development and deliverable for a competitive success [11]. MPM also have an advantage of using resources on sharing basis from the common resource pool. This will appreciably reduce the amount of resources as needed for the required activities. The traditional project management approach executes a project as an individual endeavor. Hence each project has its own resource requirements in the organizational resource pool. However, when all the similar work is executed as a programme or multi-projects, the usage of resources will be optimized on sharing basis from the same resource pool. In this way, a rational controlling and planning will also help to reduce the resources usages to a considerable level and support the agenda of sustainability as well [16]. The literature shows that MPM have a significant contribution in the development and implementation of organizational strategies. MPM can be viewed at three distinct levels; however, they are threaded with each other throughout the life cycle. These levels are business strategy level, multi-project level and project level. Figure 1 represents a MPM conceptual framework adopted from the precedent literature. The outer loop represents the external environmental factors which include political, technological development, customer demand etc. These factors have a direct influence on the formation of an organization business strategy. So, it forms the second loop. Now at this stage multi-projects are identified and organizational goals are set to support the overall business strategy. It also includes 13 basic elements that are considered as basic steps for developing MPM implementation plan. The third inner loop shows the portfolio of projects within the multi-projects [8]. The basic goal of MPM or Programme Management approach in any organization is the planning and execution of organizational plans. Programme (Multi-projects or group of related projects) are consider at a top level where work is directed across multiple lines of business. During Programme life cycles, projects produce deliverables whereas programme delivers benefits and capabilities that an organization can utilize to sustain, enhance and deliver organizational goal [12]. MPM is a mean of achieving organizational goals and objectives in the perspective of strategic plan. However, it is quite possible that a group of projects within a MPM may have a discrete benefit but they often contribute in terms of combined benefits as defined by the programme [11].

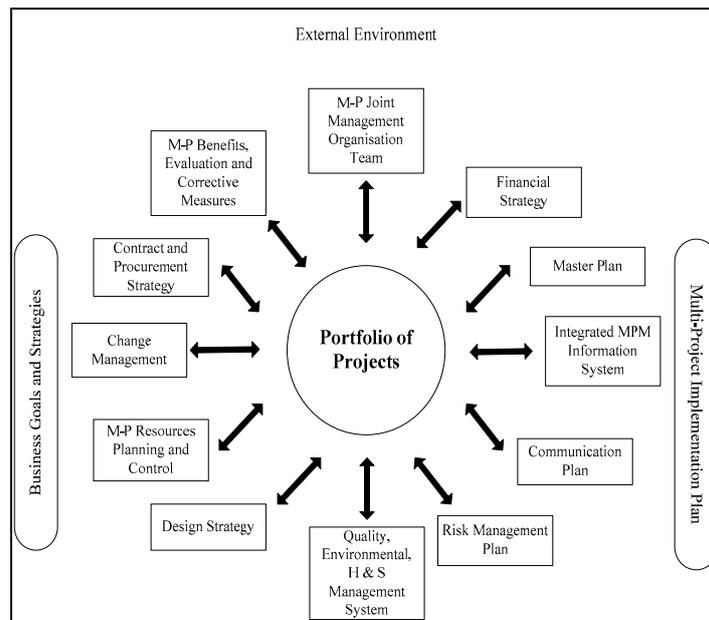


Fig. 1. Relationship between Business Strategy, Multi-Project Level and Project Level [8]

Figure 2 illustrate a top down relationship between strategic vision, programmes (MPM) and projects [12]. The model indicates that strategic management processes provide guidelines, goals, and strategic objectives to the MPM (Programme) function. This function helps to deliver benefits and capabilities that the organization can utilize to sustain, enhance and deliver origination goals. In addition, MPM ensures alignment between projects and organizational strategic objectives through a continuous feedback loop that takes input from the strategic objectives and feeding the outcomes and benefits of the projects back into it. The model also provides a basic framework for understanding the interrelationship between Strategic Vision, MPM and projects.

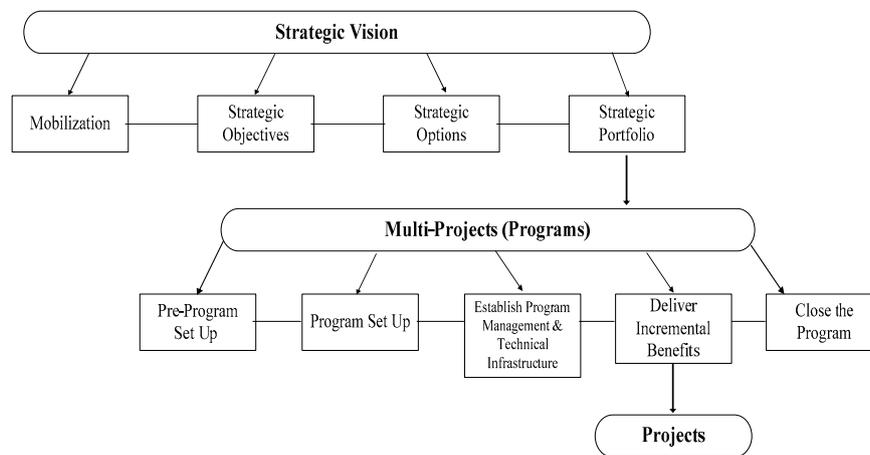


Fig. 2. Relationship between Portfolio, Programme (Multi-projects) and Projects [12]

### 3. Financial Optimization through Multi-Project Management

Construction projects are usually classified into residential schemes, commercial buildings, industrial setups and infrastructure / heavy construction works. In a multi project environment, these different types of projects share common resource pool for example material, equipment and manpower. Thus, MPM provides an integrated and structured approach in order to align, allocate resources and executes plans to manage a number of related construction projects to achieve optimum benefits. Authors have highlighted that sharing of common resources in related projects is a vital aspect of MPM and may help in effective allocation and resource levelling [17], [18]. It helps to reduce idle time as well as assist in identification of project

interdependencies and thereby cut down the frequency of work backlogs, rework and delays [19], [20]. It has also been observed that execution of parallel projects in MPM supports the knowledge-sharing among projects and hence, save expenditures that may occurred on extra employment and staff training [21]. Furthermore, it will also facilitate in choosing the economical methods of working by emphasizing reusability of equipments and facilities instead of procuring new ones [7]. Hence, centralized management of projects via MPM is considered to be more cost effective and it will support financial optimization in construction industry through minimal and best utilization of resources.

#### 4. Conceptual Framework

It has already been discussed in the previous section that outputs from construction projects are facilities required by human beings as their residences, commercial and services buildings. Other examples of deliverables are heavy civil works and infrastructure development projects [22]. Although, these projects are unique in nature as each of them has its own characteristic. Nevertheless, all of them required same basic resources and processes for construction works. Based on the above literature review, a conceptual framework for financial optimization in construction projects is developed as illustrated in Figure 3. It shows the interplay between individual projects, MPM approach and best use of resources. The theoretical base of this framework is derived from the precedent literature which establishes that how MPM approach and best resource utilization leads to financial optimization in construction projects. Figure 3 elaborates all those linkages in a sequential manner. It shows that financial optimization is an outcome variable of MPM of individual projects. Further, this framework also supports the agenda of sustainability in construction through the mediator and the output variables i.e. best use of resources and financial optimization. These two variables are affixed to the minimization of energy / resource consumption and economic benefits respectively, which are considered as important aspects of sustainability in construction industry [23].

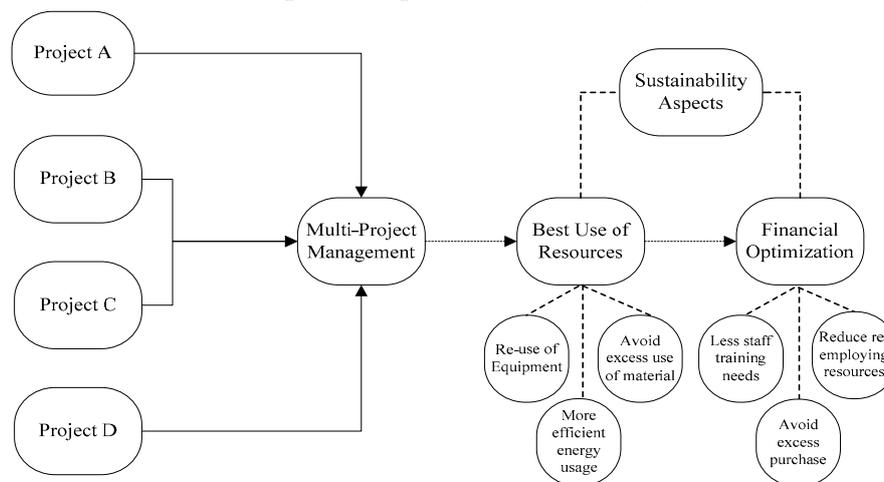


Fig. 3. Conceptual Framework for Financial Optimization in Construction via MPM

#### 5. Conclusion

The main significance of this study is to establish the importance of MPM approach to the area of construction project management. It provides an approach of financial optimization through a programme of related projects and aligns it with the organizational strategy and objectives. This study has also emphasized how coordination of multi-projects supports the agenda of sustainability in construction. The proposed research will improve knowledge in determining effective ways of aligning individual project through MPM with the organizational strategy and strengthen its effectiveness and efficiency through better management. The research presented in this paper is part of an ongoing PhD research at the Civil Engineering Department of Universiti Teknologi PETRONAS. A more explicit and pragmatic study is envisaged on the proposed framework as a future work, in order to validate its practicality for the local construction industry.

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