

# **A Research of Managing Design Project: An establishment of Design Project Management Framework**

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## **Abstract**

*Managing a design project arguably needs a simplest organizational structure. There are established methods and procedures on which to base a suitable structure for managing design projects. Project management tends to deal not only with a process or system in carrying out a particular task (e.g. a military project) but also entails the crossing of functional and organizational boundaries to achieve higher levels of performance and productivity. In this research, the concern of project management is to use management skills in coordinating design activities with other tasks in the organization, ensuring the provision of comprehensive design activities being given a high priority in the project strategy. The paper is concerned with design process in organizations seeking to act systematic criteria in the design activity on the application of design project development in complex theories. This paper attempts to establish a systems-theoretic framework supporting creativity in the design project management, where the design process is considered to have as its basis the cognitive process. One aim of this research is to concern Design Project Management Framework (DPMF) as presented in the academic conference is to show how to manage design projects and all the work stages from the project launch to project completion.*

**Key words:** managing design project, project management, design work, design brief.

## **1. Aims of the study**

Modern project management emerged between 1930s and the 1950s. The evolution of project management has been closely related to developments in modern management theory, particularly in organization design (Morris, 1994). The core consideration of project management is the design work as a whole, in terms of the continued design and development of project-driven management strategies. Both the promotion of multi-disciplinary design project and the effective design communication to be vital in order to improve the productivity of a design project. This study eventually seeks a way to enhance opportunities for inter-disciplinary design working in terms of the development of a management method for the design project aid.

Good management is a key factor in promoting efficiency and systematic methods of working in design project. Without an accurate design process, a project is more likely to stumble from one crisis to another, making its design results and production virtually impossible. The successful performance of large multi-disciplinary projects requires enormous co-ordination to ensure all designers are constantly aware of the ever-changing status of the project.

This study has two main objectives. Firstly, it aims to develop a modern management framework. To promote multi-disciplinary design working particularly more effective design target could be achieved by providing experience of the management process. Secondly, the objectives of this study also include developing a design brief which demonstrates the viability of a checklist approach for inter-disciplinary design projects. The development of such a design brief is intended to managing each design work stage, but that design communication should remain with the designers.

## **2. The nature of design project**

### **2.1 Definition of design project**

Design projects are difficult to study because they are generally multi-organizational and hence often involve sensitive issues that many participants are to have discussions. As a consequence of evolutionary development in World War II and in the 1950s, managing the project has been defined on the basis of new methods and techniques of problem solving, management and operations research (Morris, 1994). Furthermore, most design projects are often of long duration and the multiplicity of topics that need more broadly defined or realized.

Design projects involve the control of the design work process as well as the "people" and "documentation". Most design projects involve more than one design responsible, designer, and other experts (Topalian, 1989). Design project can be seen as a programming. It involves making decisions in order to produce a set of clients of an artefact that satisfies a set of performance requirements and constraints (Yamakawa, 1997). However, to identify and define design project, the characteristics of the specific design work must be clarified by defining design project needs and the nature of the design work of the project.

## **2.2 The design work process**

### **2.2.1 Introduction**

This paper processes a framework for examining the influence of the design work which, in the final finding, is a more sophisticated approach to the planning design process. The author deems that “design brief” is one of the most important aspects that impact the quality of the design process. The conceptual approach is constructed on the basis of the design process studies respect to the subject of design project management. When writing this, an exploratory study of design processes is in progress, in which the conceptual framework of the design brief will be discussed in an analysis of a real design process.

### **2.2.2 The nature of design processes**

According to Portillo (1994), the main criterion of the design process is its contribution to the imaging and shaping of design through knowledge that will establish the attributes and functions of a structure. As a result, design processes represent design as a series of activities and information requirements, presented as linked stages based on a design method (Austin, 1999). In particular, the design process should be developed so that domain-specific design decisions can be reached rather than providing a work list describing what should be done (Newton, 1995).

Generally speaking, the design process consists of planning, methodology and development to implement design practice. The design process is not necessary for every project, but usually prescribes more than one responsibility to cover all involved expertise (Dias and Blockley, 1994). The use of a prescriptive design process entails continual modification and improvement of existing processes to meet design practice demands. For the most part, the general purpose behind developing a design process is to solve complex design problems (Eisentraut, 1999). Three approaches describe the role of design process; these are planning, methodology and development. Mapping these features can characterize the nature of design project:

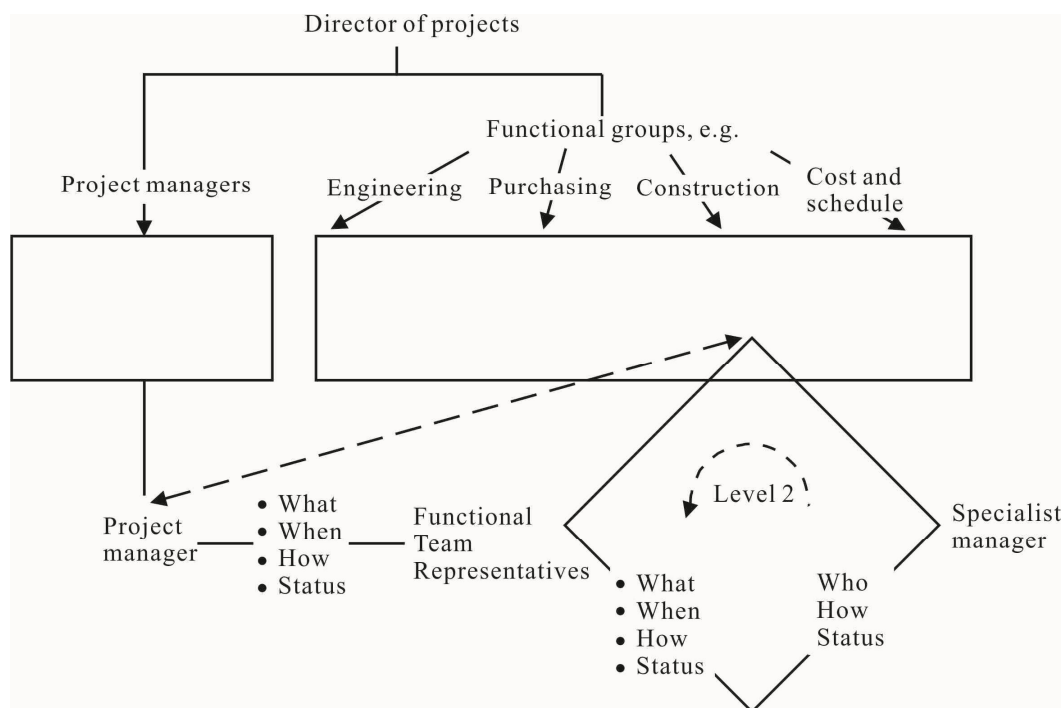
- (1) Planning: Design planning begins with the product development strategy and ends with a design specification for a project (Baxter, 1996). Design planning is an initial strategy to form a design approach to innovation. Based on the engineering design process, planning as a development process contains natural milestones corresponding to the completion of each phase (Ulrich and Eppinge, 1995a).
- (2) Methodology: Many designers adopt design methodology in practice to refine the nature of the design activity and the structure of concrete problems (Roozenburg, and Eekels, 1995a). Design methodology is the science of methods that are, or can be, applied in designing. It emphasises the rules and methods for thinking and acting that provides designers with knowledge of the design process.
- (3) Development: Development can be identified as series of design activities (e.g. briefing, concept, design). Lloyd claims that design development is a logical consequence in the ability of technology to transform a set of requirements into a real event (Lloyd, 2000).

Another definition by Eisentraut (1999) is that design development is a style of decision making.

Baxter describes design development as an innovative process, which he in the following terms: Creativity is at the heart of design, at all stages throughout the design process (Baxter, 1996). Roozenburg and Eekels (1995b) propose a systematic development process to classify the attributes of 'design planning' and 'design development'. Based on this idea, Ulrich and Eppinger (1995b) apply 'development' to manufacturing engineering and say that design development is a sequence of stages that transforms a set of inputs into a set of outputs.

### 3. Managing the design project

During the 1920s, the earliest writings on project management tended to describe the approach within the context of the development of specific industrial projects (Morris, 1994). Between the 1930s and the 1950s, project management was related to developments in management theory, particularly in organizational design, planning and control systems. (Figure 1)

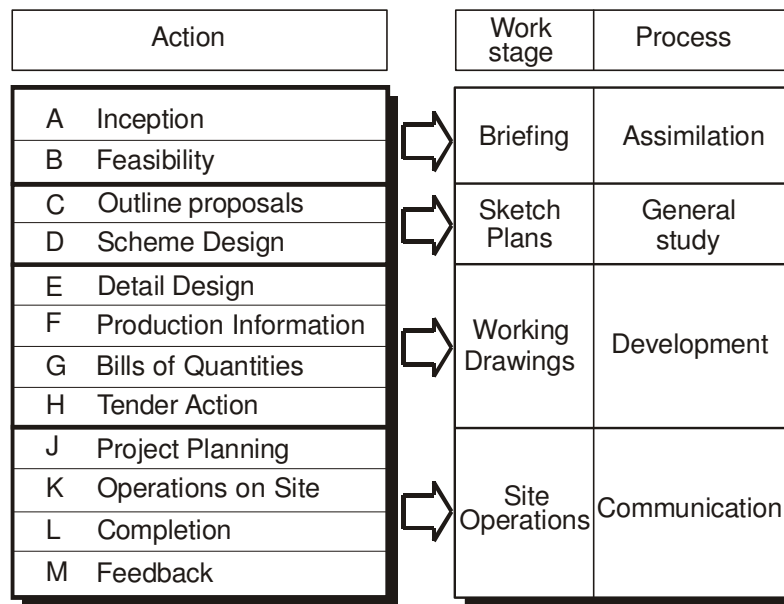


**Figure1: Morris's description of the project management functional group**

During a design project, the progress can be controlled against the proposed program by using a project management system for planning and processing work. Systematic design process that allows designers and design manager to cope with the complexities of multi-disciplinary design working as well as meet design requirements in the design project context. For example, the RIBA (Royal Institute of British Architects) is an independent institution in the UK, originally published in 1967, has the role of a design guide for architecture. The Plan of Work is a prescriptive process, which provides a methodical framework for clients and building professionals (Newton, 1995). The aims and objectives of the RIBA professional work

plan are based on improving specific project development by organizations and building professionals.

Such a design process is a linear sequence of working stages and is described from the viewpoints of design, management, engineering and construction. Each phase is interpreted very differently, as each is formed to the requirements of the given work processes. In particular, this plan of design issues is concerned with the activities associated with design objectives, design feasibility and design priorities (Figure 2). The architectural model for example, describes management to ensure the project is effectively planned, coordinated, directed and controlled (RIBA, 1973). If in some way design project can be managed and co-ordinated in one project then it is believed that more accurate and workable design solutions would be produced.



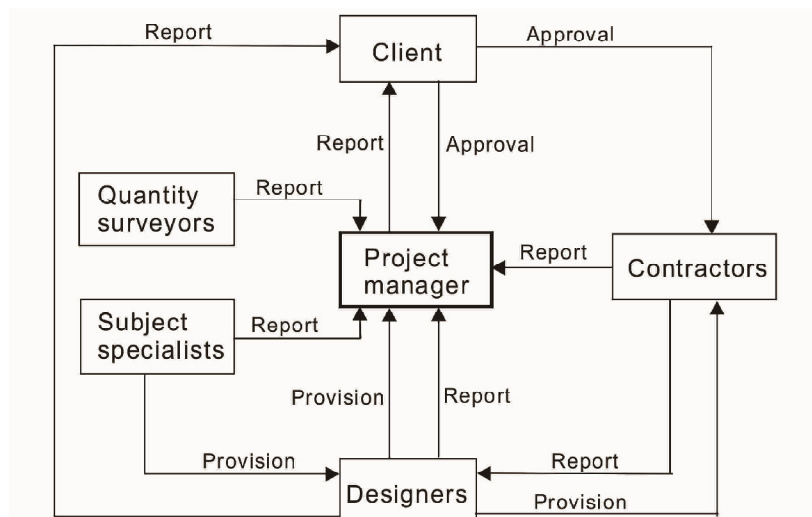
**Figure 2 The RIBA Outline Plan of Work**

### 3.1 Management of design team

Managing design project is the design team, design work and design communication of taking the design brief to meet certain demands in the best possible way. Project management is well established and plays an integral part in ensuring design work proceeds as smoothly as possible. There are different types of design team, ranging from individuals working with support when necessary to large teams in complex organisations. Planning and designing projects normally involves a variety of disciplines and people. When a project is started, it is useful to plan the information necessary and establish a core development team.

The design team is a group of experts who are responsible for developing the project, from generating the concept to setting out the production. The team consists of the client, designers, technology specialists, contractors and others as necessary. The composition of the team will vary throughout the project, depending on the requirements of each stage. The team develops the project from the beginning to create comprehensive,

reliable ideas and achieve project aims. The members of the design team focus their attentions on the purposes and aims of the design task so that the process of design and production can progress as fluently as possible towards the implementation of project tasks. The task of project planning is to set up a strategy for verifying that its objectives have been met and identifying the client's requirements in order to launch the project and appoint an appropriate development team (Figure 3).



**Figure 3: Design people relationships within the development team**

Project design managers deal with corporate strategy and build brand identity through products, advertising and promotions. They use design management strategically and tactically as a pure and purposeful process to build the company's strategic plan (Dobbins, 1998). Design project management is especially concerned with innovation and creativity, to the benefit of the company and customer needs. This implies that design management is one of several pathways in which managers learn to exploit design and management thinking and keep their business growing and competitive (Walton, 1998).

### 3.2 Management of design project

Project management is a strategy used by project managers or designers to undertake project planning, design and construction, to the point of delivering the project to the client. Project management lays down a strategic pathway for the management of product, service, and organizational process change. The core consideration of project management is the project process as a whole, in terms of the continued design and development of project-driven management strategies. Managing project work has been planned as a design role, often in the belief that this process cannot be presented in detail. It is essential that project management provides clearer and more easily realizable benefits from improved planning, consequently, communication

and creativity methods become accepted management processes.

The managing design project includes detailed costing, delivery deadlines and, intermediate milestones (British Design Council, 2001) and work stages which incorporate a design briefing, which is agreed by the whole project team. Successful design project management demands a strategy, which can propose well-defined values by clear statements of vision which communicate between the client and the design team in order to achieve the project mission.

### **3.3 Management of documentation**

Design project are traditionally constructed on a discipline basis and then co-ordinated centrally. Information in this context concerns both design process and people. Project information relates to the project itself and usually is expressed in terms of specifications or drawings and could be a design brief. Poor information management can lead to error or unclear coordination within the design team. A series of documents are required to develop a good project documentation and run the project and they directly affect the success of the design outcome. They describe all relevant constraints, such as the scope of the work, the designers' approach, criteria, specifications, design tasks, client requirements, materials and production.

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The purpose of a document is to formalize issues and deliver documentation which others can understand to realize the development situation. Design documentation includes questions, objectives, strategies, meeting records, design briefs, plans, checklists, answers and statements, and reference points about the action being taken or which should be taken as the work proceeds (Tunstall, 2000a). Key design documents describe full design proposals in graphics, words or symbols. To achieve complex design work, an adaptable methodology for information should be produced within each design project.

## **4. Formatting the project design management framework (DPMF)**

### **4.1 Aims and purpose**

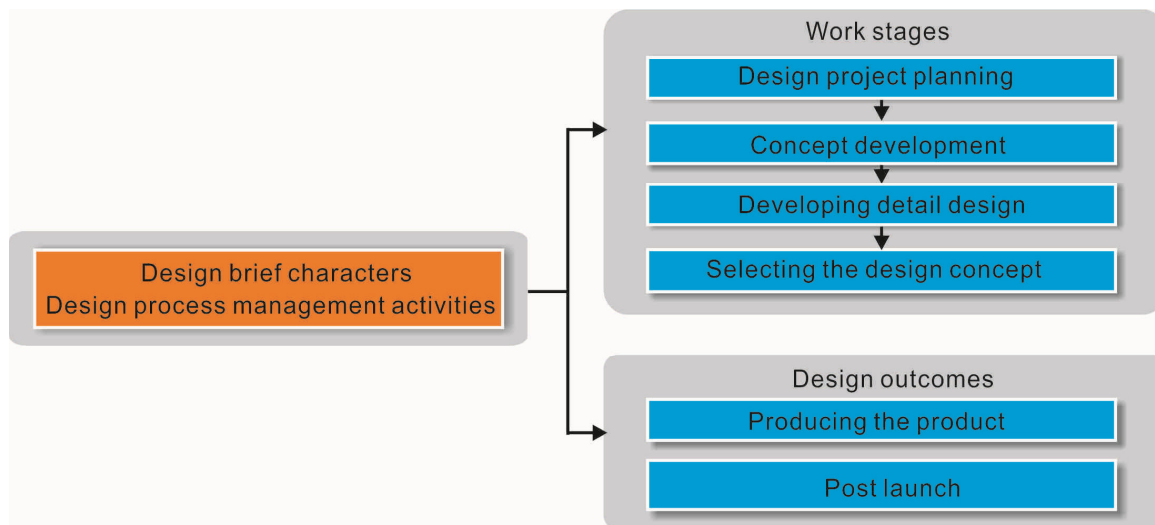
The purpose of managing design project is to set out the most efficient design method for project participants to transform design information into alternative design concepts, then from design concepts to real design work. The concern of the design process is design concept context. The requirement for design expertise is to identify design criteria and form the group of design disciplines to ensure the design work fulfils design objectives. The aim of developing the management framework is therefore to:

- (a) provide a structure that can embrace the many problems that arise during the definition and development of a design work;

- (b) provide a sequence of procedures that enables a design to be elaborated which solves problems;
- (c) enable all the participants in the development team and other interests in project development to communicate and understand each other; and
- (d) allow design options to be considered and their implications to be identified.

## 4.2 Design project brief

The design process can be viewed as a management function which is extremely important to design tasks and to the design outcome. Topalian (1980) states that managing the design process should be concerned with the specific level of users' needs and concludes that the design brief is managed at two different characters: the work stages (project planning, concept development, detail design and design concept) and the design outcome (product producing and launch) (Figure 4).



**Figure 4 The design brief characters**

Traditional design management is usually based on the deliverables for which the design team is contractually obliged, namely drawings (isometric, plan views, cross-section, etc.) and specifications. The use of brief as a guide to the amount of work completed has inherent difficulties. This approach is crude and superficial, giving only a rough guide to progress of design work without consideration of the design activity itself. The design project brief is a unique combination of problem solving, creative, need fulfilling and human activity processes.

When the design project brief has been developed to the requirement where it can be applied for various design stages within all project participants. At an early stage of planning the project, all the information to be communicated should be prepared, ideally as part of the brief which should consist of all



ideas, background data and statistics, (Velarde, 2001). The design brief forms the basis of the project participants' criteria and the specific requirements of the project. A design brief provides a framework within which the design team may deal with detailed procedures during the design project.

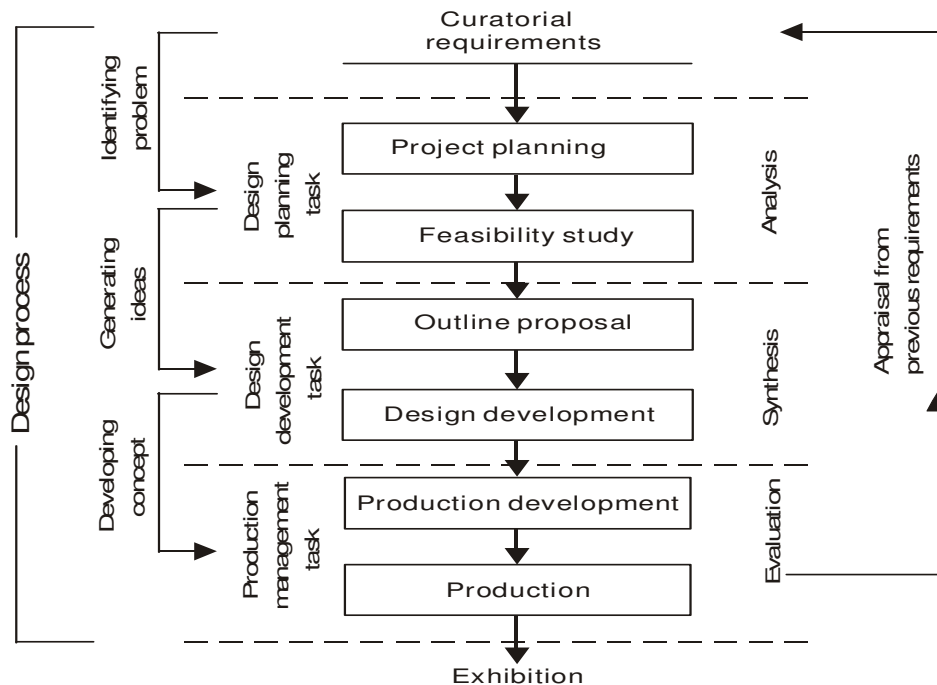
The project brief should define all design requirements. It should be prepared by the designer in collaboration with the client, and with coordinated contributions from all consultants and museum specialists. The project brief should cover the aim of the design, including prioritized project objectives; the site, including details of accessibility and planning; outline specifications of general and specific areas; and a budget for all elements.

#### **4.3 Mapping the design project management framework**

The design process is a continual activity of generating, selecting and organising elements to establish the most important parts in the creation of new product ideas (Tunstall, 2000b). Many design problems occur within individual disciplines as well as between disciplines, as a result, a decision made by one member of the team is likely to become another's problem.

In order to construct the design brief framework, a set of components of design method were isolated that were representative of the conceptual phase of design project. Extensive discussions resulted in several solutions that were pertinent to the development of the proposals. The purpose the framework is to set out the most efficient design method for project participants to transform design information in to alternative design concepts, then from design concepts to design projects.

The design process framework has been developed, identifies the role of project requirements as critical for project participants in making the process model functional and workable. Such a framework should enable all participants in the development team to examine their requirements, and to establish an understanding of how to adapt project criteria to design work. For all but the simplest of design tasks, the design process is not in simple linear form, but feedback features in each design stage allow designers to work systematically with other specialists. This forms the basis of the 'management' and 'design' functions of the design process and allows each discipline in the development team to contribute as well as feedback and reflect on experience of the previous stage which are: (1)Project planning (2) feasibility study (3) outline concept (4) Design specification (5) Design development (6) Design solution. (Figure 5)



**Figure 5 The design stage framework**

This process framework has a number of properties. Its application in real practice is more complex than any other design processes intended for this purpose. The exhibition planning framework enables participants to understand the various disciplines that are involved in the design project. In order to carry out the inter-disciplinary co-ordination activities of the development team, process-users need to focus on its application within their discipline, as well as the project. In the framework, flow diagrams and textual descriptions were added to make it easier to understand. Furthermore, the framework is more concerned with information links and the relationships between participants that give rise to iteration and negotiation.

### 4.3 The structure of framework

A schematic approach to the design process has been constructed in order that all the activities can be clearly understood. The appropriate use of the design process during project development provides a structure for identifying and analyzing museum exhibition criteria, developing design data, synthesizing design solutions and evaluating design concepts.

Design projects are not managed by systems, documentation, but by people. People proceed to design work in preparing plans, communicating, operating systems, making decisions and communicating. The key issue of the new managing design project framework (DPMF) is that management task has complicatedly multi-disciplinary been expanded from a simple affair, more mechanistic concept of project management (Morris, 1994). To manage a design project that could cope with the many complexities inherent in people (design team), documentation and design work (Figure 6 and Figure 7).

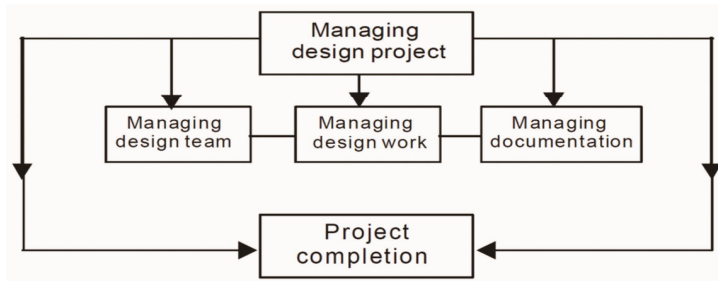


Figure 6: Preliminary structure of managing design project

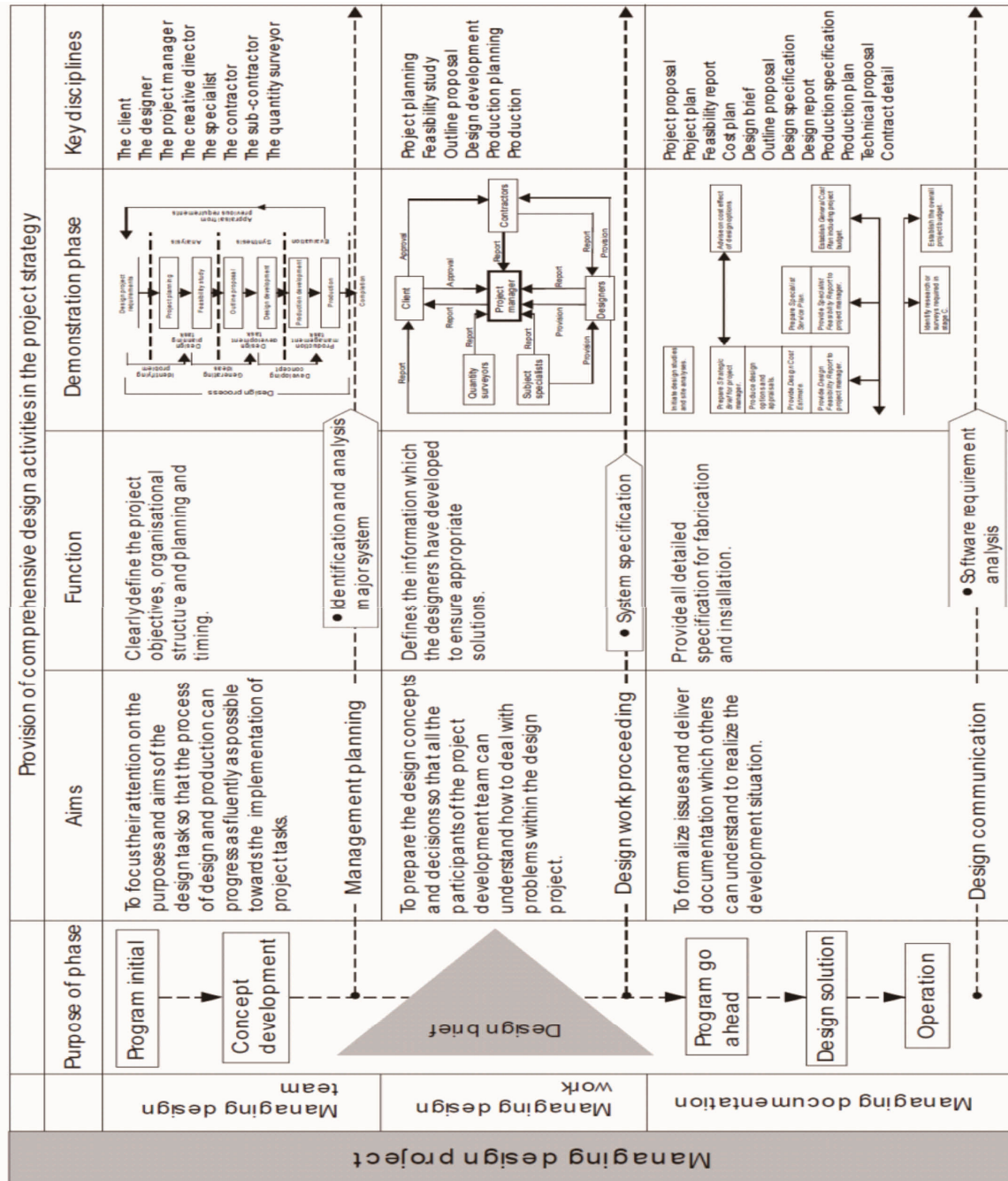


Figure 7: Structure of Managing Design Project Framework

## 5. Conclusions and future work

### 5.1 Conclusions

In this study, the concerns of design project management framework as presented in academic periodicals is to show how to manage design projects and all the work stages from the project launch to production completion. Writing documentation (e.g. proposal or plan) and planning design work is a project management activity. Managing the design project is confronted in more detail by the series of work stages and project documentation that gives direct responsibility for project control, verification, review and evaluation. To enhance such a multi-disciplinary design project, this study involved two major subjects, i.e. the understanding of design project for project management, and the development of an intelligent design project management method.

One aim of this study is to explore the extent of management, which is seen as one of the key roles in the development of the design project. In this study, the concern of design project management is to use management skills in coordinating design activities with other tasks in the organization, ensuring the provision of comprehensive design brief being given a high priority in project strategy.

### 5.2 Future work

The best way of validating Design Project Management Framework (DPMF) is to use it to produce design solutions for on-going projects and the co-ordination of the design work. The DPMF should also be tested to see how applicable it is for design work performed by single discipline practices rather than large multi-disciplinary design teams. Therefore, the following issues need to be investigated to analyze the anticipated benefits of the DPMF:

- (1) Using the DPMF for detail and concept design;
- (2) Software that generates a logic network that can be linked directly to available project management;
- (3) Using the DPMF to identify the design project role and indicates the tasks; and
- (4) The simplification of multi-disciplinary design project.

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