

# A STUDY OF MANAGING HEALTHCARE PROJECTS IN HONG KONG

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Cost and time overruns have always been considered as a common feature of running healthcare projects. Hospital projects, because of their unique characteristics, are more complicated and difficult to manage. To improve the adverse situation, various innovative measures, such as value management, partnering concepts, and design-and-build procurement method, have been introduced in recent healthcare projects in Hong Kong. The effectiveness of these innovative measures could be evidenced by the outstanding performance of some recently completed projects. Based on twenty in-depth interviews with industry practitioners, preliminary conclusions on the major problems, success criteria and critical success factors in running healthcare projects in Hong Kong were derived. The integration and coordination of building services, changes from the multi-head client and various end-users, and up-to-date technology are the major problems that the project participants need to face in running healthcare projects. Time, cost and quality are still the iron triangle of the success of a project, however, to achieve the functionality is also found to be an important criterion for healthcare projects. In order to achieve better project success, the effect of human-related factors, such as the performance of client, consultant and contractor, is also essential. It is envisaged that a comprehensive questionnaire survey on the potential problems, success criteria and critical success factors will be launched in Hong Kong for more in-depth exploration.

Keywords: critical success factors, healthcare projects, Hong Kong, problems, success criteria.

## INTRODUCTION

The growing and ageing of the local population has been increased in the demand for intensive medical and healthcare services and the need to construct more hospitals. However, a building project is completed as a result of a combination of many events and interactions, planned or unplanned, over the life of a facility, with changing participants and process in a constantly changing environment (Sanvido *et al.* 1992). In a large and complex building project, the environment is even more dynamic and turbulent. Wilkins and Smith (1996) suggest that healthcare projects, especially publicly funded hospitals, take a longer time to deliver to the community. These long delivery times consist of lengthy pre-construction and post-contract periods. Wilkins (1997) further identifies that the difficulty of coordinating end-user requirements and minimizing subsequent changes, together with the consequent delays and unforeseen extra costs, has been a significant feature of hospital procurement.

The topic of project success is developed to set criteria and standards by which project managers can complete projects with the most favourable outcomes. However, the concept of project success has remained ambiguously defined both in the project management literature and the minds of construction professionals (Freeman and

Beale 1992). While some authors consider project success as merely meeting the technical performance, cost and time requirements, others suggest that success is something more complex than simply meeting these basic criteria. Many project managers attend to these success factors in an intuitive and ad hoc fashion as they attempt to manage and allocate resources across various project areas. The need to identify critical success factors is particularly acute in the provision of major healthcare projects due to their complexity, long design and construction periods, ongoing developments in healthcare planning and technology, and the need for a highly accountable approach to procurement by health authorities.

This paper, based on the earlier research work by Chan *et al.* (2003a, 2003b and 2003c), provides an interim report on an on-going research of healthcare projects in Hong Kong. Based on twenty in-depth interviews with industry practitioners, preliminary conclusions on the major problems, success criteria and critical success factors for running healthcare projects in Hong Kong were derived. This paper is divided into three main parts. Methodology upon which this study has adopted will be firstly presented. It is followed by the discussion on the preliminary results that were consolidated from a series of structured interviews. Finally, a conclusion will be drawn for further detailed investigation.

**Table 1:** Background information of interviewees

Nature of company	Number of interviewees	Position
Hospital Authority	2	Project managers
Consultants	5	Project managers, engineers
Contractors	6	Project managers, project coordinators, site agents
Government Departments (mainly from Architectural Services Department)	7	Architects, engineers, quantity surveyors, technical secretary

## METHOD

The present research was conducted by literature review and structured interviews. In order to identify the difficulties of running healthcare projects, a critical review on the relevant literature, was conducted. The literature findings were verified by a series of structured interviews with some experienced practitioners who had hands-on experience in running healthcare projects. Similar 'research by interviews' was conducted by Gyi *et al.* (1999) in the accident and health research. After that, two proposed models were developed on the basis of a comprehensive literature review on the success criteria and critical success factors in a general construction project. The basic principle is reviewing related articles of the last ten years of some major management journals, such as Construction Management and Economics, ASCE Journal of Construction Engineering and Management, Engineering, Construction and Architectural Management and etc. It helps to set a base for the interviewees for ranking their opinions.

Twenty structured interviews were conducted, including the contractors, consultants and client representatives. Table 1 shows the background information of these interviewees. Content analysis, therefore, was chosen to analyse the substantive content of the interview as Simister (1995) states that it is the principal method used to analyse interviews. All the opinions of the interviewees were then summarized and analysed to provide an overall picture of the management of the healthcare projects.

## PROBLEMS IN RUNNING HEALTHCARE PROJECTS

Cox and Grove (1981) define healthcare buildings as 'Buildings that provide for healthcare fulfil many different functions and accommodate the whole life span of man'. Smith and Wilkins (1995) identify inadequate coordination of end-user requirements and the pressure of accountability to the Government as the main problems associated with healthcare projects. To further explore the difficulties in running healthcare projects, an empirical study has been conducted with a group of practitioners who had hands-on experience in hospital projects. The followings are the major difficulties identified by the interviewees in managing healthcare projects and with references to Chan *et al.* (2003a):

### **Highly complicated building services**

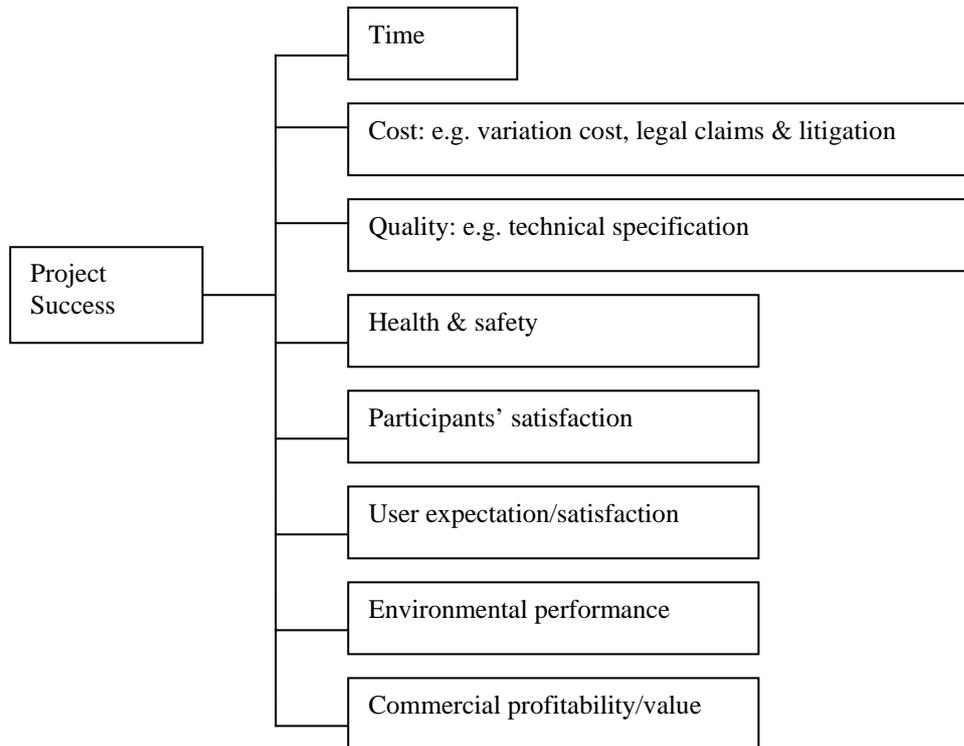
Nearly all the interviewees, especially the contractors, suggested that the up-to-date technology and the complicated building services are the main problems that they need to face. To satisfy the purpose of providing fast and accurate cure to the public, hospitals are required to incorporate the most up-to-date medical technology and modern hospital engineering services requirements such as the medical and non-medical gas installation and x-ray equipment. Besides, building services must satisfy the hospital functional requirements for a perfect hospital. These, however, should follow the developments in clinical practice and changes in medical technology (Lam *et al.* 1997a). It means that the target is moving constantly and quickly. Therefore, the hospitals are complex and most up-to-date technology is required. It sometimes generates serious integration and coordination problems, and hence leading to time delay and intractable conflicts among the contracting parties.

### **Frequent changes by multi-head clients and various end-users**

The interviewees agreed that changes of end-users are the main source of uncertainty and sometimes results in the problems of project delays, disruption and additional costs. The ultimate users of the healthcare building are heterogeneous. As hospital projects contain a lot of specialised medical facilities and functional equipment, only specialists with professional knowledge are able to comment on their suitability and adequacy. Consensus from these diversified groups of end-users may be difficult to obtain. The design consultants need to gather the information from all specialists during the design stage. The contractors also need to discuss the detail drawings with numerous end-users during the construction stage. It will prolong the pre-construction period. Besides, request of changes to the design layout from end-users is not uncommon even when it is at the construction stage to cope with the medical advances and fast moving medical technology. The proposed selection of machinery and techniques also could become obsolete within the stipulated duration of the construction period. It results in frequent changes of specifications. It creates great difficulties for the contractors and consultants to face from design stage to the completion.

### **Fixed budget and tight time schedule**

Another main problem the interviewees faced is the fixed budget and tight time schedule of the healthcare projects. The contractors thought that apart from the above two problems, tight time schedule is another major issue. For example, plans for the construction of a new hospital in the northern part of the New Territories were initiated by the Hospital Authority in 1992. The Financial Secretary announced the launch of the hospital in his budget speech in March 1993, and he committed to



**Figure 1:** Consolidated framework for measuring project success

complete the project by June 1997 - a period of just over four years (Chan 2000). Some even claimed that the original project duration set by the government is unfair as the department regardless of the scale and complexity of the projects. From the consultants' and client representatives' points of view, they were more concerned with the fixed budget. It is because nearly all hospitals are publicly funded in Hong Kong, so it must be accountable to the public. Once the project is announced, the budget would be under scrutiny of the society, and under the spotlight of public concern. Therefore, with the tight schedule, closely defined budget and the expectation of high quality standard for publicly funded hospitals, both the designers and contractors are facing great challenges.

## SUCCESS CRITERIA OF HEALTHCARE PROJECTS

Criteria of project success can be defined as the set of principles or standards by which favourable outcomes can be completed within a set specification. Project success means different things to different people (Chan *et al.* 2003b). Pariff and Sanvido (1993) consider success as an intangible perceptive feeling, which varies with different management expectations, among persons, and with the phases of project. Owners, designers, consultants, contractors, as well as sub-contractors have their own project objectives and criteria for measuring success. Even the same person's perception on success can change from project to project. Therefore, definitions on project success are dependent on project type, size and sophistication, project participants and experience of owners, etc.

Chan *et al.* (2003b), show that there are a number of researchers who have intense interests in this topic over the last ten years. In the early 90s, project success was measured by the project duration, monetary cost and project performance (Navarre and Schaan 1990). Time, cost and quality are the basic criteria to project success and

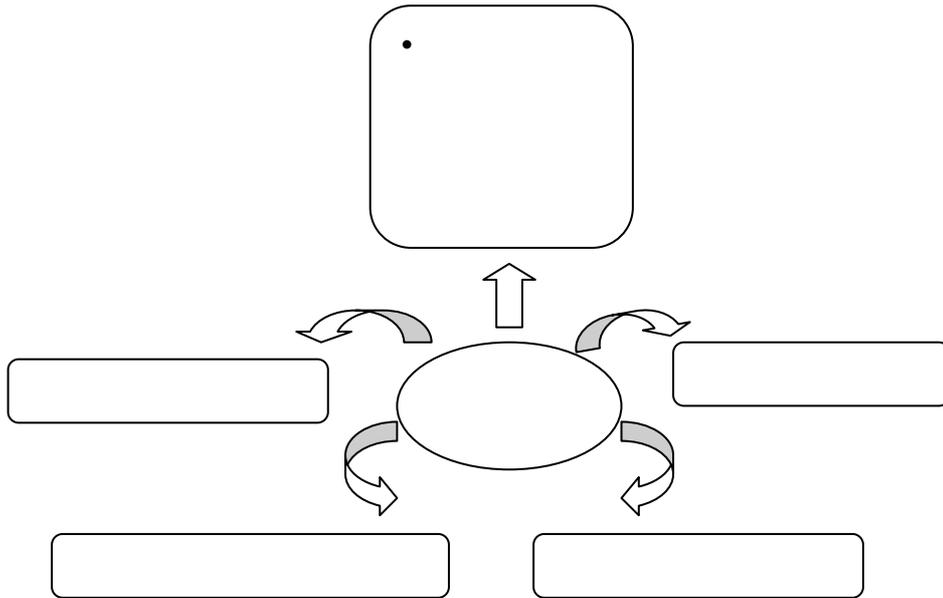
Atkinson (1999) names them as the 'Iron Triangle'. In addition to these basic criteria, Pinto and Pinto (1991) advocate that measures for project success should also include project psychosocial outcomes that refer to the satisfaction of interpersonal relations with project team members and they are known as the 'soft' measure. Pocock *et al.* (1996) further suggest including the absence of legal claims as an indicator of project success. This then calls for including 'safety' as a success indicator as well. After that, the researchers further define the project success along with the project duration or in specific category, such as Shenhar *et al.* (1997), Atkinson (1999) and Lim and Mohamed (1999). From the comprehensive literature review, a consolidated framework for measuring success of construction projects was developed (Figure 1) and is used as a base for the interviewees to set their criteria of healthcare projects.

After the structured interviews, all interviewees agreed that nearly all of the proposed criteria are the success criteria of healthcare projects, except the commercial profitability or value. From the contractors' point of view, they regard the project as successful when it is completed on time, within budget and with required quality standard. These are the basic targets that every contractor wants to achieve. Besides, low accident rate and environmental friendliness are also their areas of concern. Profitability is also an important criterion. It is because construction projects are the income and revenue of their companies. Being a contractor, completed on time is essential as it links to the profit that he can obtain. Project time and budget overruns may sometimes be conducive to litigation which incurs significant financial loss. Environmental friendliness and site safety are becoming more important today as they reflect the social responsibility of contractors towards the public community and government legislation.

The criteria of the client representatives and consultants are slightly different from the contractors. They concurred with the contractors' opinions, except the commercial profitability. Moreover, the highest ranking criterion from them is the functionality. They explained that the healthcare building is a type of 'functional building' and it serves for the public, therefore, the building completed with its stated functions, is essential. They believed that trivial time and cost overruns are acceptable. To determine whether the building can achieve its functions, the end-users' feedback is a good indicator. Hence, the satisfaction of end-users and client is also one of the success criteria. Time, cost and quality are still the basic criteria; however, their priorities are not as high as the functionality. Environmental friendliness and safety are public concerns and important to the healthcare projects, it is because free from water, noise and air pollutions during construction and maintenance period are essential as the surrounding environment will largely affect the curative process of the sick people.

## **CRITICAL SUCCESS FACTORS OF HEALTHCARE PROJECTS**

In order to achieve the outstanding performance, the factors that contributed to the defined success criteria need to be identified. The term of critical success factors (CSFs) in the context of the management of projects was first used by Rockart in 1982 and is defined as those factors predicting success on projects (Sanvido *et al.* 1992). A critical success factor was assumed to have the same degree of importance throughout the life of the project (Pinto & Prescott, 1988). However, CSFs in each project may vary subject to the changing environmental variables, and hence, there is no one best route to success (Liu, 1999). Similar to the previous section, a number of variables influencing the success of project implementation were identified with reference to



**Figure 2:** Framework on Factors Affecting Project Success

Chan *et al.* (2003c). It is suggested that CSFs can be grouped under five main categories. These include human-related factors, project-related factors, project procedures, project management actions and external environment. Figure 2 shows the framework on factors affecting the project success.

### Human-related factors

Chua *et al.* (1999) group the project manager, client, contractor, consultant, sub-contractor, supplier and manufacturer as the key participants in a construction project. Their influences to the projects success are significant. Besides the factors related to each individual stakeholder, there are other variables influencing the success in the project-participants-related factor, such as team spirit, communication, coordination and top management support (Belassi and Tukul 1996, Chua *et al.* 1999 and Dissanayaka and Kumaraswamy 1999).

The attributes of this factor can be mainly divided into two categories, one is related to client, and the other is related to the project team. For the first group, it includes client's experience and capability, nature of client, size of client organization, client's emphasis on cost, time and quality, and client contribution to the project. For the second group, it includes project team leaders' experience and skills, project team leaders' commitment on time, cost and quality, project team leaders' involvement, project team leaders' adaptability and working relationship, and the last one is support of the project team leaders' parent companies.

### Project-related factors

Walker (1995) proposes project scope as a useful predictor for construction time. The project characteristics factors, such as type, size, complexity and duration of the project are concluded by Akinsola *et al.* (1997) which have a significant influence on the total value of variations and their frequency. The attributes used to measure this factor are proposed to include the type, nature, number of floors, complexity and size of project.

### **Project procedures**

Dissanayaka & Kumaraswamy (1999) indicate the importance of procurement factors and non-procurement factors in their research. Two attributes, procurement method and tendering method, are used to measure in this factor.

### **Project management actions**

The factors related to the project management emerged in the early 90s. Project management is a key for project success (Hubbard 1990). Kog *et al.* (1999) also state that the managerial action is critical in achieving project success, particularly with large and complex fast track projects. Munns and Bjeirmi (1996) state that the role of different project management techniques, such as the planning and control of time, cost and quality, has been widely established to implement projects successfully. Therefore, a number of attributes are involved in this factor, namely, the communication system, control mechanism, feedback capabilities, planning effort, organizational structure, safety and quality assurance program, control of sub-contractors' works and finally the overall managerial actions.

### **External environment**

Belassi and Tukel (1996) suggest that some factors are external to the organization but they still have an impact on project success or failure. Akinsola *et al.* (1997) describe 'environment' as all external influences on the construction process, including social, political, and technical system. The attributes used to measure this factor are economic environment, social environment, political environment, physical environment, industrial relation environment and level of technology advances.

From the five major factor categories, all interviewees believed the human-related factor is the most critical success factor of running healthcare projects. Healthcare building is a functional building and its construction is complicated and special, the project team's experience is very important. With adequate level of experience, the interviewees believed that they can foresee some typical problems and handle them more rapidly and adequately. Client's experience and ability is also influential. The contractors claimed that a clear design brief is crucial for them to complete the project and it is also supported by some researchers, such as Lam *et al.* (1997b) who also state that the importance of briefing to the overall success of the project from the client's perspective should be treated as an important issue. They further identify that the greater the details of the brief, the more accurately the designer will interpret the client's needs and 'complete' design can be developed for smooth coordination of M&E services. The working relationship among the parties must be in harmony and co-operative. The interviewees thought that if each party has the same level of commitment, the operation will be smoother and less disputes will be resulted. Besides, the project management factor is also highly ranked. Basically, the project management factor and the human-related factor are closely-linked. The interviewees claimed that good planning before construction is critical, it largely influences the subsequent operation. They also believed that good site supervision, coordination and communication can ensure the outstanding performance. The effectiveness of the management depends on the skills of the project team, so these two factors are inter-dependent. For the other factors, most of the interviewees disregarded the implication of the project-related factors and the external factors. They thought that the attributes of the project-related factors, such as the type, size and complexity of projects can be anticipated well in advance, so the impacts from them can be foreseen. On the contrary, the external factors are unanticipated that they are unable to control,

therefore, this attribute can be neglected and with good management, they believed that such problems can be overcome. The interviewees agreed there is an implication of the project procedures on the success; however, it is in lower priority. They explained that although the adoption of design-build system is a growing trend in Hong Kong nowadays, its effectiveness is still uncertain and also largely dependent on the experience and skills of client and project team leaders. But they claimed the prequalification for the tendering system is necessary as it helps to guarantee the quality and capability of the contractors.

## CONCLUSIONS

Construction of the healthcare buildings, because of its unique features, is a rather difficult and time-consuming task. This paper is an interim report on an on-going research of healthcare projects in Hong Kong. It provides a comprehensive literature review on the problems, success criteria and success factors of running healthcare projects. From the structured interviews, the major problems of running healthcare projects identified are sophisticated building services system, up-to-date technology, frequent requests of changes of various end-users, and tight schedule and budget. Besides time, cost, quality, safety and environmental friendliness, it is found that functionality and satisfaction of the end-users are also viewed as important criteria for the success of the healthcare projects by the interviewees. To achieve the outstanding performance, the capability, skills and experience of clients, consultants and contractors are the most significant factors. Having a clear design brief, good planning, effective communication and control system can also ensure the success of the projects. To further investigate this research topic, it is envisaged that a detailed questionnaire survey on the problems, success criteria and critical success factors will be launched in the Hong Kong context for more in-depth investigation.

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