

# Refurbishment of the old hospital building construction essay



Health issues are the primary concern of the government and needs to be dealt with high priority. This project is about ABC hospital trust which is under performing given the available hospital infrastructure. The desired result is to improve the hospital infrastructure and provide relief to the local community.

There are two options available:

1) New Build project

2) Refurbishment of the old hospital building.

The new build project seems to be a sound financial investment with regards to the public sector procurement. Benefits to be derived from this would be lower operational costs, lower maintenance costs, lower energy consumption, better budget control, high quality, improved functionality, and timely completion of the project. In Public sector procurement great deal of preference should also be given to the full life value of the project rather than short term capital cost.

This report is a consideration of different procurement options with respect to addressing the objectives of the client and to achieve best value for money with a focus on the public sector procurement. It also presents a project management plan that includes various tasks which needs to be carried out for successful completion of the project. The Work Breakdown structure (WBS), linear responsibility Chart (LRC) and Action Plan (AP) are used to illustrate the type and scope of work which needs to be done over the entire life of the project.

By taking all these factors in to consideration the integrated approach in the form of Design and build- Novation is adjudged as the best form of procurement. The main points which make this system reliable are speed of construction, single point responsibility (usually a contractor who would be responsible for managing the design and construction of the project); savings in cost along with maintain design standards throughout the phases of the project. (Masterman, 2006, pp. 66-90)

## **INTRODUCTION**

The project is to provide a 6 storey hospital building providing acute care, accident and emergency, maternity and outpatient provision according to NHS Estate's own design standards. Majority of the building will be given to inpatient services.

The new build project option would comprise not only of the hospital building but also the associated road works, parking, hard and soft landscaping drainage and external works along with office accommodation, restaurant, and warehouse and delivery areas. The new build site is derelict and has been demolished to the ground level. It was used by heavy industry and has slabs and foundation remaining. The site is also subjected to subsidence and requires ground stabilization. There is a derelict pedestrian bridge which needs to be demolished. Also there are mineshafts which need to be blocked before the commencement of construction as it would be a major safety hazard.

The refurbishment option of the existing building would involve substantial refurbishment and remodeling of the existing building. This would require

intricate phasing and planning to allow its healthcare activities to continue. This would hinder the progress of the project which could in turn affect project completion times. The trust cannot afford this as they have limited time in their hands to make the facilities operational. Moreover substantial refurbishment and remodeling would involve costs which will be highly uncertain.

The client is familiar with only conventional or the traditional procurement system. Traditional system requires design to be completed well before the actual construction commences. “ The sequential, fragmented and confrontational nature of the traditional system can result in lengthy design and construction periods, poor communication between clients and the project team and problems of buildability.” (Masterman, 2006). The client has only 48 months to get the improved facilities operational. Hence, due to time constraint the client needs recommendation for new types of procurement systems to cope up with project deadlines and budget.

## **STAKEHOLDERS**

“ A project stakeholder is a person or a group of people who have a vested interest in the success of the project and the environment within which the project operates.” (Olander & Landin, 2005, p. 1).

The inference is that stakeholder can be an individual or a group of individuals which have the power to be a threat or a benefit for the project. Project managers should try to address the concerns of all stakeholders with effective communication to avoid conflicts and controversies in the project to ensure smooth completion of the project. (Olander & Landin, 2005, pp. 1-8).

Lack of integral engagement with stakeholders could also lead to failure of the project. They form an integral part of the project and one of the crucial factors in smooth completion of project. On the other hand, Business also has some stake in the individuals or groups for using their resources or their influences for running the business. (Walker & Marr, 2001)

For this purpose they have to be analysed in the following way :

Identification of stakeholders

Stakeholder mapping by Power/interest matrix & Power/predictability matrix

Stakeholder Management

## **IDENTIFICATION OF STAKEHOLDERS**

Different stakeholders that can be associated with this project will be ABC hospital trust, City council – local authority, Project manager, Architects, Contractors, Material Suppliers, Site Engineer, Structural consultants, NHS, Health and safety regulations, Wild life conservation, Insurance company, General Public- end users(patients and visitors), Hospital employees, Fire department.

## **STAKEHOLDER MAPPING**

Stakeholder mapping can be done by arranging all the stakeholders of this hospital project into Power/Level of interest matrix and Power/Predictability matrix.

## **Power / Level of Interest Matrix for this project**

Stakeholders with low level of interests and low power are easy to manage and would require minimal effort. (Newcombe, 2003)

Stakeholders with high level of interests and low power to influence them needs to be informed about the major decisions of the project. (Newcombe, 2003)

Stakeholders with low level of interest but with high power should be dealt with carefully and should be kept satisfied, failing to which their level of interests will rise and they will become stakeholders with high power and high level of interest. (Newcombe, 2003)

Stakeholders with high level of interest and high power are key players and should be given top priority. The strategy of the project should have their consent at all times. (Newcombe, 2003)

## **Power / Predictability Matrix for this project**

According to Power/Predictability matrix following inferences can be obtained:

Stakeholders with low power and low predictability are manageable.

Stakeholders with low power and high predictability will seldom cause any problems.

## **STAKEHOLDER MANAGEMENT PROCESS.**

Project success criteria should be carefully evaluated in terms of time, cost and performance which might be influenced by or affect or concern the

stakeholders directly. For effective execution of the project, resources should be available on time. These resources many a times would be at the discretion of the stakeholders. So after carefully analyzing stakeholder groups and interest levels along with predictability, stakeholder analysis with respect to stakeholder's attitude should be carried out. (Turner, 2003, pp. 103-107)

Stakeholder attitude can be accessed by the current level of support for the project by key stakeholders. With progress of the project, the stakeholder's attitude towards the project can change which needs to be carefully monitored by the project manager. The different attitudes of the stakeholders can be summarized as follows:

Changing the negative stakeholder's attitude will require efforts by the project team. Key stakeholders should be the main focus of the team as they can affect the success of the project. When the stakeholder's current commitment towards the project match their required commitment level then they must not be ignored, as ignoring them might change their attitude towards the project which is not desirable for the progress of the project. (Turner, 2003, pp. 109-110)

## **STAKE HOLDER OBJECTIVES**

The main objective of the stakeholders would be to get high quality of health care operational within precincts of time, budget and quality.

Future developments should be sustainable.

## **CLIENT OBJECTIVES**

To select the best procurement route to achieve better value for money and to ensure the requirements of the stakeholders are met.

To ensure the new facilities are in accordance with NHS design panel.

To ensure that the project is completed within the time frame of 48 months given to them from the government.

## **PROCUREMENT SYSTEMS**

“ Procurement is a strategy to satisfy client’s development and/or operational needs with respect to the provision of constructed facilities for a discrete life cycle-By International Commission on Building (CIB W92) during its 1997 meeting.” (Masterman, 2006, pp. 26-27)

It can also be defined as the “ process that involves design, specification and acquisition of goods and services.” (Carter & Kirby, 2006)

Procurement not only should encompass the method in design and construction of the project but also the cultural, economic, managerial, political and environmental issues raised by their implementation (McDermott & Rowlinson, 1999)

## **CLASSIFICATION OF PROCUREMENT SYSTEMS**

Procurement systems can be classified as follows:

Separated procurement system

Integrated procurement system



## Management oriented procurement system

### Discretionary system

#### 1) Separated procurement systems:

This type of system also known as the conventional system has the responsibilities for design and construction allotted to separate teams such as design team, quantity surveyors, contractors etc. For proper execution of the project the client has to deal with all the members of the project team and is himself responsible for funding and risks involved. Traditional system of procurement comes under this category. (Masterman, 2006, p. 28)

#### 2) Integrated procurement systems:

This type of system deals with responsibilities for the design and construction bestowed usually on the contractor. Hence in theory, the client has to deal with only a single organization. Design and build, novated design and build, package deal, turnkey approach are examples of this type of procurement system. (Masterman, 2006, p. 29).

#### 3) Management-oriented procurement systems:

This type of systems has the management aspect of the project carried out by an organization in co-ordination with designers, consultants to execute various activities of the project. The client will have a greater involvement in the project as compared to other procurement systems. Management contracting, construction management and design and manage come under

the category of management oriented procurement systems. (Masterman, 2006, p. 29)

4)Discretionary systems:

This system many a times can be argued that in reality this is not a procurement system, instead it can be means of controlling the project. The definition by Construction Industry Board (CIB) W92 states that “ It is a strategy to satisfy client’s development and / or operational needs.” The selection of the procurement system depends on the client and he lays down a framework for the overall administration of the project. Partnering and British Property Federation system are examples of this type. (Masterman, 2006, pp. 28-29, 131-136)

## **SELECTION OF PROCUREMENT ROUTE FOR HOSPITAL BUILDING**

Selection of a procurement route involves many factors to be considered such as Project cost, completion time, quality standards required, size of the project, risks involved, complexity of the project. Based on all the above factors Design and build novated system seems to be a suitable option for the hospital project.

The main factors to be considered in this project keeping in mind the requirements of ABC hospital trust are:

Project completion time

Project management efficiency

## Project costs

Provide relief to the community.

## Best value for money

Project completion time is a major factor to be considered as any delay in this project completion would result in closure of the hospital which would have a major impact on quality of health care in the city. Delay in completion time would also result in delayed commissioning of medical equipments.

Design and build – Novated system enables design and construction stages to be overlapped in the project enabling speedy completion of the project. Commissioning of medical equipments and making quality healthcare operational within 48 months can be achieved by using this procurement system.

Walker (1997) agrees to Smith and Wilkins (1996) that non-traditional procurement systems are more likely to enhance construction performance. (Morledge, Smith, & Kashiwagi, 2006)

As design and construction stages are overlapped it helps in improving communications between the client (ABC hospital trust) and the contractor. Hence overall project management efficiency is improved along with shorter project completion time.

Certainty of project costs in this kind of procurement system can be achieved as there is no ambiguity in the client's requirements. " Evidence also exists to support the widely held belief that when using this system the initial and final costs are lower than when using other methods of <https://assignbuster.com/refurbishment-of-the-old-hospital-building-construction-essay/>

procurement basically as a result of diminished design costs, the integration of design and construction elements and the in-buildability of detailed design. This evidence was given further support by the University of Reading's report when it was established that projects procured using this system were a minimum 13 percent cheaper than those using more conventional approaches." (Masterman, 2006, p. 79)

Existing hospital can continue to provide some relief to the community till the new hospital building is constructed.

Best value for money can be achieved by assessing on the whole life cost of the hospital rather than the initial capital costs. (Morledge, Smith, & Kashiwagi, 2006). Whole life costs will not only include construction costs but also operational and maintenance cost over the life cycle of the project.

## **WHY NEW BUILD PROJECT**

Benefits of choosing a new build project with design and build- novated type of procurement (New build) as compared to refurbishment are as follows:

Refurbishment - Existing Hospital.

Design & Build Novated Approach

Requirements of the client

1)

Uncertainty of Project costs as refurbishment can bring out many unknown costs involved in it.

Certainty of Project costs.

Project costs should be certain and should not exceed the estimated costs.

2)

Uncertainty in completion time required for the project as the hospital would be in operation during refurbishment.

Project completion time is certain. High speed of completion as it overlaps design and construction phase. Construction is 12% faster as compared to conventional systems. (Masterman, 2006, p. 78)

Project should meet the 48 month deadline and should be fully operational.

3)

Being an old building, it will be difficult to incorporate energy efficient methods or new technology leading to higher operational costs.

New buildings can accommodate for energy efficiency which would lower the operational costs of the building.

Low operational cost of the building.

4)

Though the report show that refurbishment costs are lower as compared to new building, uncertainty in time and costs will lead to choosing new build.

Construction costs are

higher but certain.

Low construction costs.

5)

Whole life cycle costs would be more because of high operational costs throughout the life time of the project.

Whole life cycle costs will be less and good value for money can be achieved.

Best value for money.

6)

Less energy efficient building. High costs would be involved to employ energy efficient methods

Sustainability can be achieved with lower costs of accommodating energy efficient methods.

Sustainable Construction.

7)

Difficult to accommodate changes in design of building.

Can be built as per the latest design required to incorporate changes in technology.

Flexibility in design to accommodate changes in technology.

8)

Existing health care facilities would be partially available to the public as refurbishing activities would be going on simultaneously.

Existing health care facilities will be available to the public in the old hospital.

Maintaining the existing healthcare facilities and upgrading them for future.

## **SUPPLY CHAIN MANAGEMENT**

Supply chain management can be defined as “ the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.” (Vrijhoef & Koskela, 2000)

Supply chain management involves selection from different sellers and buyers in order to get greater benefit from them rather than just focusing on an individual.

Well managed supply chains often save up to 20% of the total supply chain costs whereas a poorly managed supply chain can ruin the economy of the company. (Gattorna, 2003). Present advances made by commercial companies in understanding the ways in which the supply chain works leads to significantly enhanced expectations for people who are responsible for procuring, commissioning and managing the construction activities.

(Morledge, Smith, & Kashiwagi, 2006, pp. 41-42).

## **EFFECT OF PROCUREMENT ON SUPPLY CHAIN**

The most problematic area in the procurement process lies in the different stages of the construction supply chain between the interfaces of organizations. (McDermott & Rowlinson, 1999, p. 58) In design and build - Novated approach, the contractor is responsible for design and construction of the project. Being the sole person or agency it reduces the interfaces between organizations leading to efficient supply chain management. Also, the contractor might be having business relations with suppliers which would enable faster and effective communication between them regarding the requirements of the project.

## **EFFECT OF PROCUREMENT ON QUALITY**

The designers have a task to integrate all the requirements in the project like fit for purpose, sustainable considerations, durability, strength, the aesthetics of the building, construction methods, selection of materials etc. This system has the same design team throughout the progress of the project providing better co ordination and clear objective for achieving high quality & sustainability in the project.

## **RISK MONITORING**

Construction projects require decisions to be made. Risk management is the technique used for decision making process. It is critical to have sufficient knowledge regarding the impact of the decision. Delay in making decision for gathering more information would result in delays in the project which would be highly detrimental and decisions made without sufficient information could have huge impact on the project. Hence, Risk identification and



analysis form the basic steps to be performed in any project. (Smith, Merna, & Jobling, 2006)

Risk identification should be done for the entire project life cycle rather than only construction phase. Selection of suitable procurement route will ensure that risks are dealt in the best possible way. Risks not identified at the inception stage would require negotiations with the contractor which may or may not be successful. If successful then it would involve increased financial implications on the part of the client leading to cost over-runs.

Risk identification can be done by three different methodologies:

Brainstorming sessions.

Analysis of historical data.

Use of Industrial checklists.

Assumption analysis.

Delphi technique.

The primary motive of risk identification is the recognition of potential sources of risk rather than perfect predictions of the future. Be any kind of procurement, risks are bound to be involved. We can just minimize the risks involved by selecting procurement system based on the requirements of the client and objectives of the project.

Cheung (1997) suggests that risks should be allocated using the following priorities : person or organization best able to control risk effectively, who

can absorb it financially, who has most information to control it, who benefits most from scheming it or for whom risk is normal in its business role. This can be used to allocate risk properly to the right agency which will benefit project progress. (Morledge, Smith, & Kashiwagi, 2006, pp. 18-19)

## **EFFECT OF SELECTION OF PROCUREMENT ROUTE ON RISK ALLOCATION.**

In design and build - novated approach, it is the responsibility of the contractor to deal with design, construct and commissioning. Sometimes, operation and maintenance are also included in contractor's scope of work for ensuring that it is upto the client's specification. All the risks associated are borne by the contractor rather than the client. The inference is that the client's involvement in the project would be minimal. This approach increases the risks for the contractor when compared to conventional approach. Once the specifications are finalized it is difficult for client to alter them. Altering the specifications would result in increased premiums. So it is essential to prepare the specifications carefully to avoid cost associated risks involved in the project. (Smith, Merna, & Jobling, Risk allocation in Contracting Cycle, 2006).

## **BEST VALUE FOR MONEY**

ABC hospital trust can achieve best value for money by choosing the new build project as it would lead to reduced whole life cycle cost, lower operational and maintenance cost. Being a new building, it would be easy to accommodate for energy efficient new technologies. It would lead to sustainable construction practices which won't be possible or will be difficult to implement in refurbishing the hospital building. Design and build-novated

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procurement system gives high speed of construction(early completion of the project) along with certainty of cost making it the ideal procurement system for this project with respect to value for time and money.

## **BENCHMARKING PERFORMANCE**

Performance can be measured during construction by:

### Milestone Completion:

Experienced Project Managers know that it is important to check the planned and actual completion dates of project milestones and physical evidence that the work is actually completed. (Schwalbe, 2006)

### Performance Review meetings

Periodic project performance review meetings with the management help in tracking the project and control project schedules. A tracking Gantt chart that compares planned and actual project schedule information can be used for reporting the information to the stakeholders of the project. (Schwalbe, 2006)

### Worker morale

The morale of workers and their work behavior will give a clear indication of the schedule performance. For example: If the project team members are working for extra hours every day then it will be a clear indication that the schedules are not realistic and the project manager would have to add more resources or reschedule it.

Performance can be measured after construction by UK Best Practice Program (BPP) by evaluating the Key Performance Indicators (KPIs): Client Satisfaction – Product, Client Satisfaction-Service, Defects, Predictability-Cost, Predictability-Time, Profitability, Productivity, Construction Cost and Construction Time. (Kagioglou, Cooper, & Aouad, 2001)

Performance of the hospital project can also be measured in terms of productivity. Productivity of this project can be defined as the ratio of the output of a production process to that of the input production process. In relation to the construction industry it can be calculated by ratio of work units completed during a period to its associated costs in terms of man hours or dollars. According to Thomas & Kramer work hours, quantities and productivity are evaluated with baseline values used in project estimates. Effectiveness of the current performance can be measured by comparing current performance to the historical data or planned productivity. (Cox, Issa, & Ahrens, 2003)

## **RECOMMENDATION & CONCLUSION**

The recommendation for ABC hospital trust is to construct a new hospital building using design and build – Novated procurement system. This approach would reduce project completion time and increase cost effectiveness for the project. Quality at site, sustainability in construction activities can also be achieved with great success. Selection of this kind of approach would deliver good value for money for public sector procurement. This report also recommends periodical assessment of risk and stakeholders simultaneously with the progress of the project for avoiding conflicts. With careful monitoring of interests of the stakeholders in the project and <https://assignbuster.com/refurbishment-of-the-old-hospital-building-construction-essay/>

appropriate risk management, the hospital project can be completed in an effective manner. Finally the end result to be achieved by this project would be 'win-win' solution for all.