

Procurement route selection and analysis



The purpose of this report is to evaluate the procurement routes of construct a new auditorium with high specification technology for Heriot Watt University. The report includes defining several procurement routes, determining the recommended procurement route for this project. This report also covers the evaluation of influence factors and the potential benefits for adopting the recommended procurement route.

Background

Heriot Watt University (HWU) is planning to build a new auditorium at the existing grass land next to HWU's park with the land area of approximately 1500m². The proposed auditorium is single storey with mezzanine floor with total 1950m² gross floor area.

The requirement and the need for auditorium shall be perfect for conferences, lectures and presentations, includes the facilities as following:

- 200 comfortable tiered seats,
- high specification technology,
- multimedia theatre with air conditioning,
- full size interactive screen and computer driven presentation facilities,

In view of the HWU top management has decided to build a new auditorium, the project's procurement strategy has to be formed for achieve the optimum balance of risk, control and funding for this project.

2. 0 Procurement Strategy

Procurement is the amalgam of activities undertaken by the client to obtain a building (BPS, 2nd Edition, 1990). The project's procurement strategy is established for identify the most appropriate way of achieving the project's

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objectives and the value for money. The key steps in implementing the procurement strategy as following:-

Finding out the real needs for the auditorium project and the project's objectives;

- Analysis the procurement routes for the auditorium project
- Evaluating the procurement strategy and the influence factors
- Implement procurement strategy and design team selection and contractor selection for the project
- Final handover for operation and review successfulness of the project

There are many factors are able to influence on procurement strategy and subsequently influence on the selection of procurement route. We have listed down some most important factors for top management to consider for the procurement route.

The project objectives and the client's capabilities

HWU with a history dating back to 1821, has established one of the top UK universities. The objectives of the project are to build a new comfortable auditorium with high technology and to be able to complete within the cost limit, to the required quality and within the time constraints.

In view of HWU is not a regular developer of works, the risk to HWU for this auditorium project shall be minimized. The HWU shall be the single point of contact and responsibility for the project during design and construction and in the event of the building failure.

During the design stage, our HWU top management would like to implement their concerns and reliable ideas into the project. The high specification technology with special equipments would like to require some changes to the design due to the unable fixed cases.

Risk management

Risk management is critically important to project success. It involves identifying and assessing risk, assigning the right risk owners and continually managing, monitoring and reporting on key risks. (OGC03, 2007)

In order to determine the most suited procurement route, the necessary comparison of varies procurement routes such as Traditional Route, Design & Build route, Management Contracting Route & Construction Management Route, etc will be done. Chosen of any route will have its own risks. When the procurement route is determined, the specific key risks, that HWU adopts, must be managed efficiently.

The Project Constraints

The constraints of the project are that contractor is able to consider the possible impact on neighbouring buildings and the potential concerns of the neighbours. They shall apply for a new entrance and temporary access to the construction site to minimize the impact to campus. The temporary access shall be reinstated to original.

The noise pollution during the day time shall be limited in 75 dBA and in 55 dBA during night time.

In order to raise the Environmental, Health and safety standard for this project, we have proposed to use the precast components for column, slab and staircase. The consideration and adoption of precast components is not only greatly simplified the construction sequence but also help to reduce construction wastage with such practices.

Another consideration of reduce potential environmental impact is to adopt the interior drywall partition. Interior drywall is widely used in the commercial sector to build staff's offices.

With consider the above factors, the procurement strategy shall be based on the following principles and guidelines:-

The design should be fully meet the project objectives.

The project should be based on a firmed price and limited time to construct.

The auditorium must ready for operation by End of 2013 for the new intake in Jan 2014.

The contract award should be based on the company's capacity and capability instead of lowest price.

Selection of contractor intends low risk to HWU.

3. 0 Procurement route selection and analysis

Once the procurement strategy has been formed, the procurement route then can be selected with consider the client's specific requirement and how the client's risks will be minimized.

Various procurement routes have emerged to identify the procurement systems in current use, some more advanced procurement practices are often used currently as shown in Figure 2.

Traditional Procurement Routes

The traditional procurement consists of the appointment of designer & consultants by client before call for tender, and the appointment of a contractor on the other side after tender. The construction project is managed by HWU's project management with no concurrent sequence works that have to occur by following each other as brief, design, tendering & construction.

The traditional procurement route is varies in Traditional Sequential route and Traditional Accelerated route. Traditional Sequential route means the Contractors bid will be submitted based on the completed design documents and completed tender cost documents as normal. Traditional Accelerated route has requested the client to appoint the contractor earlier on the basis of partial information by negotiation or in competition. The contractor is able to be involved in the project as early as possible. The contractor's experience, knowledge and existing materials and equipments can be considered in the final design.

Design & Build Procurement Routes

The D&B procurement route has changed the traditional sequence of work. It requires HWU to develop the tender documents that will send to possible contractors for provide and return their design proposal and relevant cost.

D&B has met the client's intent for a single-point of responsibility in an attempt to reduce client's risks and control the overall costs.

D&B is allowed the design and construction works concurrently to reduce the total project duration when compared with traditional routes. D&B is also fixed the overall price prior to construction with low cost risk, so that HWU will not necessary to expend huge resources to close involvement.

D&B is varies in several types such as: Turnkey, Package deal, Design & build, Develop & construct.

Turnkey is adopted the D&B's principles and extended the contractor's responsibility to include the commissioning and fit-out of facility, that same as EPC (engineering, production & construction). The contractor has been placed with responsibility, risk and power and the client has the least risk in all procurement routes.

Develop & Construct is adopted D&B with two-stage tendering and novation for give the client greater control over both design and cost. The client will has the higher risk among D&B routes. Refer to Figure 3: Risk distribution among D&B routes

Management Procurement Routes

Construction management is a construction manager who appointed by client to advise the client on a fee basis. The client has to involve into contracts with numerous contractors that requested the client is experienced and has to be totally involved with faster response to decisions. Construction management is normally suitable for complex building project.

Management contracting can be defined as a management contractor appointed by client will advise client on the program and buildability. It requires the client a good quality brief and relies on a good quality project team. There are higher risk on the uncertain actual cost and total construction duration when compare with D&B route. See below Figure 4: Risk analysis between Client & Contractor.

Other Procurement Routes

There are other aspects of procurement routes such as Prime contracting, Partnering, Public-Private Partnerships (PPP), etc.

Partnering is a procurement philosophy that will ensure the cooperating working between client and contractor and the problems can be solved over adversarial attitudes and practices.

Partnering, Prime contracting and PPP procurement routes are mostly suitable for major and huge projects. In view of build the auditorium is a small project, it is recommended that these complex procurement routes are unsuitable or unnecessary.

Procurement Route Selection

In view of build a new auditorium is able to consider as a straightforward small project, we suggest that the “ Design & Build” procurement route shall be adopted.

D&B procurement route has considered and minimized the client’s risk. Refer to the Figure 5: Summary of Client Risk in Advance Procurement Routes.

The client has to avoid to loss control for the project and to avoid a very high price rate, the “ Turnkey” and “ Pachage deal” are not recommended for adoption in this project. Hence, we are suggesting to adopt the “ Design and Build” to this project.

D&B is a more refined form of a package deal which obtained recognition from the JCT in 1981 with the publication of the JCT Standard Form of Building Contract with Contractor’s Design (CD 81). Figure 6 is shown the procedure of D&B project.

By chosen the D&B procurement route, HWU knows the total financial commitment early in the project’s life, and also knows that HWU does not introduce changes during the course of the works. D&B has advised the direct negotiation and contact way between the client and the contractor. This has improved the communication lines and enabled the contractor not only to fully respond for the contract but also to adapt more promptly to meet the client’s needs.

The contractor is responsible for the whole of the design and construction of the building. Responsibilities are not split between designer and builder so that the client finds himself looking to separate “ parties” in the event of a building failure. (BPS, 2nd Edition, 1990)

4. 0 The Advantages and Potential benefits of D&B route

When the D&B procurement route is chosen for the project, HWU starts out on a path to success by adherence to the objectives, time, cost and quality requirements of the project.

Wider Choice of Design

By invited three or more contractors to tender for this project, different with the traditional route, more designers will provide wider idea and design intend, HWU has the wider choice to select the best design that has fully understood and achieved the project objectives. Before HWU top management have decision to choose the contractor, they can input their concerns and comments to the design rather than request changes during construction stage. When both HWU and contractor agree with the amendment, the contract is ready to award accordingly.

Time & Cost Saving

D&B saves time and cost for the client, HWU, when it is providing the opportunity to achieve innovation in the delivered facility. Time and cost savings result from the ability of the design-build team to fast-track the project by overlapping the design and construction phases of the schedule. Because the HWU does not need to provide a full set of biddable construction documents, cost savings are also associated with design.

Reduced Risk with lesser involvement

D&B allows the client, HWU, to avoid being placed directly between the architect/engineers and the contractor. HWU does not take on significant risk because of avoid the position on direct involvement.

Even more importantly, the contractor will take the responsibility for design errors and omissions under D&B route, and HWU is able to relive the major legal and managerial responsibilities. From HWU's view, the D&B is a tool to

fix many problems associated with the traditional route of contracting for design and construction separately and sequentially.

We have also compared the procurement routes as shown in Figure 7.

5.0 The disadvantages of D&B route

A disadvantage of D&B is that the contractor may use an existing building system or modular building form so that the contractor can reduce design time and save their own design fee, may lack aesthetic appeal. By chosen the D&B procurement route, HWU is able to be aware of some serious failures among building systems and shall undertake careful research before award the contract.

There is no independent architect and consultants to advice and to protect HWU's interests, is another disadvantage of D&B route. In order to avoid a blind monitoring, HWU can employ an agent to perform this role on behalf. The agent shall supervise the works from brief, tender stage to design and construction stage, until handover the completed project to HWU, to make sure that the contractor's proposal and works are complied with the required objectives and standard.

Next, once HWU issued the contract, it will be costly for HWU to change the design, materials or works. HWU has to finalize the requirement before the tender and has to finally amend and confirm contractor's proposal before sign the contract.

Finally, HWU shall be aware of the responsibility for high quality risk. Some contractor's concern with simplifying construction activities are able to lead

to a reduction in design quality, as a result, it makes design and build inappropriate for this project in which high specification technology is required. Hence, HWU shall write clearly into the brief for the quality requirements.

6.0 The Alternative Procurement Route

In case of the client has more concern on the cost control and changes of design and function, we have propose the “ Traditional Accelerated” route as the alternative procurement route.

As mentioned early in clause 3. 1, Traditional Accelerated route has allowed the client to appoint the contractor earlier on the basis of partial information by negotiation or in competition.

The two-stage tendering will be used to appoint a contractor as early as possible to the project. During the 1st tender stage, the design may not be completed and the tenderers will submit a price based on the available information. Until the 2nd tender stage, the additional design information will ready and the packages are finally priced. The client may comprise negotiation with the contractor (winning tender from 1st stage). When the price agreed, the client can award of the contract as traditional lump sum contract to contractor for commence the works.

By compare with the traditional single-stage tendering, the benefit of Traditional Accelerated route to the client are:

Shorten the tender period and quicker start on site works;

Design stage can extend to construction period, may not requested to complete for tender package.

By select the Nominated Sub-contractor, the quality is able to control by the client.

The contractor can consider their experience to the design and their existing or extra resources to this project, that they may have a lower price package.

The traditional accelerated route is suitable for our client who is not required much experience and the quality and buildability may also achieve the requirement.

The client has to consider the risks during 2nd tender stage that the contractor may not meet the client's requirement. This can be resolved by spend more time to get alternative contractor involve and seek the agreement.

7. 0 Demonstration of procurement

Researches on Selecting Project Delivery Systems found that D&B projects are delivered 33. 5% faster than projects that are designed and built under separate parties. The researches also showed that D&B project are constructed 12% faster for construction stage and have a unit cost that is 6. 1% lower than traditional projects. (PDS 1998)

8. 0 Conclusion

The Design and Build is the recommended procurement route to HWU for this auditorium project. In order to achieve HWU's expectations and vision of delivery of the project, HWU is also to be an integral part of the design

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process. A well completed auditorium project with D&B route will include HWU in the initial design process of programming and schematic design, and will include HWU's involvement not only in design stage meetings but also in the further interim reviews of the design, construction, functionality and even aesthetics at various steps along the design and construction process.

D&B has its ability to consider all relevant factors that would influence the desirability of the project. The best value selection of D&B procurement route provides for the consideration of both cost, time and other more subjective factors such as project management, quality control and team reputation.