

## **Evaluation of How Construction is to be Procured in Next Ten Years in The 2010s**

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### **Abstract**

We have different understanding of procurement. One would easily accept the idea of tendering as project procurement as this is usually the way construction product and service are procured, and is so important because the process triggers off 'business' for contractors and consultants. The other would consider tendering together with contractual arrangements as procurement. So construction to be procured in the next ten years should extend to planning and to link together tendering and contracting by integrating the planners and the implementers to satisfy clients' needs and at the same time fulfilling the business objectives of the participants. This paper attempts to re-look at procurement via public, private partnership, supply chain management and benefit trading to review the 'purchasing' dimension as understood by the business schools. It discusses the public policy from a strategic direction and highlights the procurement focus in formulating procurement strategy. Two case studies are included to demonstrate how contracts are arranged to attain integration such that the clients' needs are fulfilled and the business objectives are met. A commentary for the case studies is provided and it concludes that appropriate leadership, committed workforce and adequate rewarding schemes are the success factors for project procurement.

### **Keywords**

Procurement, Strategy, Business, Case studies

### **1. Introduction**

Construction professionals need to re-look at the requirements and expectations of today clients for the project delivery system to avoid failures and to add value. In an attempt to review the project delivery options besides the traditional and familiar arrangements, it is necessary to first of all detect the future from different directions. Since the private sector is seriously affected by the financial tsunami, for forward planning, it is appropriate to view the government direction to form a perception on the type of project in the channel. This is because the government will discuss and justify project budget before they put forward development project for implementation. A procurement initiative may well be considered at its planning stage if not the feasibility stage. The aim of this paper is to review how projects can be best organised for the next ten years with case studies to demonstrate what have been practised in Hong Kong.

### **2. How Procurement Strategy Evolves**

Government planning has been evolved from a public consultation in 2001 for formulating planning vision and strategy for Hong Kong 2030 after the release of the Territory Development Strategy in the

1990s. This long-term vision of planning provides a foresight into the use of land resources and the development potential of different areas. Land resource has to be created for such development and many of these developments are targeted to complement the strengths of Hong Kong in respect of finance, transportation, innovation, high technology, and a pivot point of knowledge/technology transfer. Since all these issues are of public concern, social, economic and political aspects have to be all considered in the project development process. Public and private partnership arrangements thus become a major consideration for disseminating project 'hardware' and 'software' in the next ten years. According to the government direction in the future under the present economic recession, the implementation of infrastructure and development projects is considered as a means to boost the economy and create employment opportunities. In doing this, the Government is to review the difficulties encountered in the implementation of infrastructure and development projects and to improve the established procedure so that the infrastructure projects can make an early start; and to distinguish the work portion that can be contracted out. Prefabricated components which are produced in the Mainland are regarded as a work portion that has been contracted out. This may mean that insitu-concrete would be preferred to be used not for technical reason, but for a macro-economic reason to upkeep the local employment rate.

## **2.1 Implementation of Infrastructure Projects**

Ten major infrastructure projects have been mentioned in the Chief Executive's 2007-08 Policy Address to enhance the quality of life in our community. This can be done in two ways: develop new areas and re-develop old areas (areas meaning urban areas, theme areas etc.), together with an expansion of transport systems including roadwork, railway, underground train to improve 'non-reachable' locations. It has been recognized that there have been procedural problems in the preparation of project plans and in the approval process, for which an 'intelligent' procurement process can help to resolve and improve. The problems facing the government are threefold. Firstly, the pre-construction planning of infrastructure projects involves many statutory procedures as well as much co-ordination work among bureaux and departments (a bureau is a higher level of authority in the government structure of Hong Kong and bureaux is the plural), which often causes difficulties and delays. Therefore, the new procurement system should aim at improving co-ordination problems between bureaux and departments. Secondly, the soaring prices of construction materials since mid-2007 and the increased labour costs have led to inadequate budget set at earlier dates for on-going projects and future projects. The price adjustment clauses in the contracts are insufficient to cope with the actual increased price; and the tender prices returned in the tendering process far exceed the approved project estimates. To avoid delay, more funds have to be injected into the projects. Thirdly, the manpower in the construction industry is sufficient to cope with the intended increased workload. In the last quarter (June to August 2008), the unemployment rate of the construction industry was about 6.3%. Training has to be provided to prepare the future for increased workload to match with the required trades and skills. In addition, there is also an ageing problem in the construction workforce and the reluctance of young people to join the industry. In this connection, the Construction Industry Council is conducting a study to assess and estimate the demand and supply of construction workers and supervisory/technical staff in the next few years whereas the Development Bureau is leading a consultancy study on the professional staff of the construction industry. Both studies engage the stakeholders of the industry.

## **2.2 The Use of Manufactured Products in Construction**

The common use of prefabricated components that are manufactured in the nearby Mainland cities has created a supply chain network and the construction workforce has been extended beyond Hong Kong. Even though contractors are asked to give priority to local workers in filling job vacancies for better handling of the unemployment rate, the Government's procurement policy may still have to follow the principles of fair and open competition, transparency as well as cost-effectiveness. This therefore imposes no restrictions on the sources of the services or products to be procured because the use of imported prefabricated components is driven by the market force. Apart from cost savings, some of these

components are just too enormous in size to be produced locally. Moreover, Hong Kong is bound by the Agreement on Government Procurement of the World Trade Organisation. This means that we cannot impose any local production requirement on the procurement of prefabricated components.

### **2.3 Planning and Development for the Future of Hong Kong**

Locally, four key approaches indicated by the government would guide Hong Kong's future development plan. The first approach was to create a sense of identity in Hong Kong through preserving local characteristics, conserving and revitalising historic buildings, and beautifying the harbour front areas. The second approach was to continue preserving the countryside by careful spatial planning and efficient use of land resources. The third was to promote low carbon energy and green buildings; and lastly, to develop new areas by adding transportation network and eco-friendly utility services to provide adequate land resources to meet Hong Kong's housing and other needs arising from the growth in population. Regarding project development, cultural preservation and urban re-generation, natural environment and environment protection, and regional co-ordination and co-operation on infrastructure development are the three main features for the coming years.

Non-locally, it is intended to create a mega bay area of urban cluster in the Pearl River Delta. An integrated city cluster is designed to turn the Pearl River Delta into a Mega Bay Area. A platform for planning professionals from Hong Kong, Guangzhou and Macao to share their experiences has been set to create high-quality and sustainable models for regional co-operation in the Greater Pearl River Delta (GPRD) City Congglomeration. The planning frame is to locate trade hubs, rail links and new tourism zones for an area convenient to pair two cities within the region for inter-city cooperative development, such as Hong Kong and Shenzhen with their edge in finance, trade logistics, air and sea transport. The construction of the Y-bridge linking Guangdong, Macau and Hong Kong has made it possible for developing a linkage among the cities in the region. This will create further opportunity for public, private and partnership arrangement in the procurement system.

### **3. Development Trend in Procurement**

Procurement is referred by Cartlidge (2002) as doing deals and Ashworth (2002) as choices in project leader, tendering approach, price determination and contractual arrangements. When public private partnership is evolved, this extends to various implications on land uses under the requirements of planning conditions in which the government plays an important role. Besides this, the trend in procurement is people-oriented. The key drivers for doing better is basically committed leadership, customers-focus strategy, integration of process, a quality-driven agenda, and finally commitment to people (Cartlidge, 2002) and these trends all gear up to a people-oriented culture. Now that the industry is 'mature' in a sense that sufficient educated and experienced professionals and personnel are working in the industry, there is capacity for seeking improvements and for doing better.

In the traditional process, the individuals of the institutionalised professionals or departmentalised personnel tend to focus on own expertise and look after self-interest without considering others' benefits. Defensive relationship is formed because each other would like to protect his/her own position. This is because traditional model emphasized competitive tender, fixed price, separation of design and construction activities, damages and penalty for non-completion. The new model proposes integration of design and construction activities, target cost or even negotiated tender, cost transparency, integrated teams and mutual benefits for improving the delivery process (Cartlidge, 2002). In adopting the new model therefore requires increased client focus, greater understanding of the function of built assets and to have a holistic view of project procurement.

#### **4. Procurement Focus**

In view of the complex reality of the project delivery system, the fundamental concept of the phases of a project need to be considered so that optimum value is delivered because a project often take a long time to complete. According to Walker, Rowlinson and Stark (2006:p.5), a typical project can be seen to comprise four principal often overlapping phases, the initiation phase, the design phase, the delivery phase and the de-commissioning phase. For better integration, the role of the planners and the implementers should overlap themselves. The crucial elements are to create trust among the stakeholders, to accommodate the business objectives and to empower the implementers. This can only be achieved by organising the framework in the project delivery process. Two procurement systems, namely, the public private partnership and the supply chain are discussed as the options to achieve these elements, and also benefit trading, which can be applied to supply chain and even to PPP. One of the major issues is how to fulfill the business objectives and at the same time satisfy the social and environmental needs of the general public.

Generally, a business describes the product, activities, or functions and market that the firm pursues (Lawrence and Glueck, 1988). A business model relates to how a company creates value in the marketplace, and is defined by Moodley and Preece (2003) as a set of value propositions an organisations offer its stakeholders, along with the operating processes to deliver a coherent system relying on assets, capabilities and relationships, in order to create value. The founding principle of business, as Cox and Thompson (1998) put it, is about “a party undertakes to carry the risk of certain activity and, upon completion, is duly reimbursed as a reward”. So for contacting for business success, it is about allocation of risk and setting the structure of power. To formulate strategy for a construction firm, Langford and Male (2001) regard it as based on a combination of intuition and informed awareness. The uncertainty of the construction business environment is complicated with the high probability of no return for investment of time and resources in the bidding process. Quick implementation would make project procurement even more complex and dynamic and this requires interaction with both internal and external sources to influence success. The supply chain concept seems to be a viable means to consider value creation together with the business component in the project delivery system.

#### **5. Public Private Partnership**

In view of the potentials of adopting public private partnership (PPP) for the procurement of infrastructure projects and public facilities, the government has formed a Development Bureaux in 2007 to oversee development projects to enable an integrative approach for planning, financing and maintaining the development projects. PPP and PFI (private finance initiative) are both procurement processes by which the public clients contract for capital intensive services from the private sector. The partnerships are formed with varying degree of formality and differing legal or commercial foundations. PPP used for the development of Cyberport and the first proposal of West Kowloon Cultural District have been criticized for benefit collusion between the government officials and business tycoons. Public concern has a critical impact and government tends to act cautiously and therefore takes more time to get the plans available for open consultation. The debate in the legislative council always brings out other issues for further considerations and slows down the budget approval process and the start-up of the projects. One major issue which has been called for public attention is the use of public space.

The incorporation of public facilities in a private development is intended to achieve integrated design, optimization of land use and better site planning or to bring forward the completion of some facilities to serve a wider district or territorial need and match with the population intake in development proposals. It also intends to make clear how to manage and maintain such facilities to the satisfaction of the Government. The government is to set rules and regulations to manage the public facilities, whereas the

owners of such developments, whether it is the public or the private sector, is required to adopt a set of reasonable, clear and transparent guidelines for all users to comply with all these rules and regulations.

In granting the land lease for private property development, it is common to have public facilities provided within private developments for public use. Public facilities within private developments can broadly be categorized into: (a) Government, Institution and Community facilities such as community halls, elderly centres, etc.; (b) public open spaces; (c) pedestrian passage and vehicular access, e.g. walkways, footbridges and rights of way; and (d) Public Transport Terminus. As governed by the specific conditions in the land leases or deeds of dedication where appropriate, some of these facilities are handed over to the relevant Government departments upon completion while others are required to be managed and maintained by the private developers or owners on an ongoing basis. With a public private partnership, the provision of public facilities within private developments for public use may arise in land sale, land grant and private development/redevelopment when it involves also planning applications to the Town Planning Board to fulfill the planning conditions.

## **6. Supply Chain Management**

A supply chain is a global network of organizations that cooperate to improve the flows of material and information between suppliers and customers at the lowest cost and the highest speed. The objective of a supply chain is customer satisfaction (Govil and Proth, 2002). It aims to integrate the design process with the supply chain to enable the design and build arrangement work well not only with a typical standard design and simple building, but can be further adopted for a complex project where new and innovative design is also one of the agenda of the project. Supply chain in construction is seen as non-integrative as owners and the final users are hardly considered in the delivery process. With the dominating multi-level sub-contracting system in Hong Kong, the situation is worsened due the increased layers in the operation process. It is believed that little understanding exists by tiers of other tiers' functions or processes, and the lack of communication between the tiers further worsen the situations. The merit of supply chain is that supplier links or the delivery processes are constantly reviewed to improve efficiency to achieve client value. Similar to that of the manufacturing industry, the construction industry in Hong Kong is also at its maturity stage and attention has now turned to the management of people relationships upstream and downstream in the supply chain. The principle of supply chain management derives from the manufacturing philosophies where the eventual impact on construction procurement is that the design process is integrated with the supply chain, unlike the traditional separate process. It aims to compete through superior underlying value as described by Govil and Proth (2002).

The use of the term "network" suggest that the companies involve in a supply chain could not only be companies that perform complementary activities but also companies that compete to perform the same activities. To obtain an integrated system that is fair for each one of its participants, an internal policy that specifies the relationships between the participants should be defined and implemented. The purpose is to ensure that workloads, benefits, and losses are fairly shared among the participants. The major issue of supply chain management thus refers to acquiring effective partnership, by treating suppliers as long-term business partners through enhancing buyer-supplier relationship.

## **7. Benefit Trading**

Benefit trading is a procurement approach developed by Porter and Connaughton (1999) to be adopted in the supply chain management to observe benefit exchange normally found in a business environment and as a means to promote integrated teams and collaborative working to create value for participants. It provides an approach to enable all the key construction participants to agree ways in which their

respective contributions can be maximised, while simultaneously achieving their own business objectives; in which each trade is to offer benefits for a return of fair award.

The fundamental principles of benefit trading are to achieve the intended value of construction. Benefit trading is assumed to work well for both private and public sectors as there is nothing in the current regulations governing the operation of public sectors that prohibit the use of benefit trading. The five key principles to be observed are:

- Identify potential trading partners and issues of real benefit to them (tradable issues)
- Understand and value tradable issues in both buyers' and sellers' terms
- Trade issues on the basis of exchanging concessions – “if you will do this I may be prepared to do that....”
- Ensure that both buyers and sellers stand to gain, but not necessarily equally; while trading may be tough, it should also be fair and based on trust – abusing trading power to extract concessions for free will, in the end, benefit neither party
- Establish mechanisms for measuring the value of tradable issues and reviewing how well benefit trading is working

Benefit trading can be used at different times in the procurement process spread through design and construction, to completion and use. All stakeholders can involve in the process and initiatives may well fall onto those who have a trading purpose to negotiate for exchange of concessions. Presently, benefit trading tends to be used mostly by contractors who has customers at his up-stream and subcontractors or suppliers at his down-stream. As long as there is a business component in the process, whether it is with the buyers or with the sellers, benefit trading is applicable for the key players include clients, design team members, general contractors, specialist contractors and suppliers.

Benefit trading emphasizes collaborative working. Collaborative working can act as a means of improving performance and is important for managing highly technical and complex design and production processes in which the supply chain plays a major role. In a manufacturing process, clear functional responsibilities for design, production, quality and purchasing have to be defined and the purchasing department carries the overall responsibility for procurement during the design stage, working very closely with colleagues in design, quality control and production whereas negotiations is continuous throughout the development of the product. The same can apply to the construction process with a major difference that these defined functions are not carried out under one company but under one ‘umbrella’ which we name it as ‘project’. In this case, a collaborative arrangement has to be made not only as a means of building on the inherent advantages of teamwork, but also as an agreement or consensus to create a positive environment in which risks can be managed and expertise shared in a mutual search for innovation and improvement in value. Most collaborative arrangements involve mutual trust and openness in dealings between team members, benchmarking, shared rewards, and agreed procedures for dealing with problems. It is expected a buyer will enter into a strategic business alliance with an individual or a limited number of key suppliers. Such collaborative arrangements can help to eliminate disputes that lead to legal action which bring excessive cost to either party or both party. This is not the intention of either or both party when coming to terms with the pricing agreement.

## **8. Case Studies**

The procurement system is studied by visiting the site, interviewing the managerial staff and discussion with the site staff. A commentary is made to the procurement systems in the two project cases.

Case 1 - This project is a residential development comprises several blocks of high-rise structure set on a podium level approximately three-storey high. A workable business model created by a local property

developer has merit in creating value and at same time delivering project with good working relationships among the stakeholders. On one hand, the developer has established a brand image for residential buildings as a responsible developer who values the users' needs. The project development office has inherited similar value by maintaining a group of committed managerial staff. On the other, the developer has their own construction companies and has developed long-term relationships with some consultant firms. They adopt construction management as the procurement method. Since the construction manager is a subsidiary company of the developer, communication between the client, the consultant groups and the construction manager has no barrier as problems arising in the design development process can be easily resolved before any real problem appears. A prime cost agreement is made between the client and the contractor with a consultant fee. Separate accounts of different companies clearly define the resources input in the process and the profit (if any, and dependent on the commitment and effort of the staff at both sides) to be realised at both ends. The business objectives of both companies are fulfilled without harming their relationships. The critical success factor mentioned by the construction manager was the flexibility and the adaptive approach they had in helping to make the design buildable to produce a quality building. The construction programme highlighted the working period of each sub-contractor activity or package. The budget for each sub-contractor package could easily be cross-referenced to the prime cost and any cost problem could be discussed and resolved among all relevant parties as there was mutual understanding. This approach fulfils the major functions of project management in respect of time, cost and quality. With the experienced managerial staff in charge of the construction process and an understanding client at the other end as well as a consultant group who knows clearly what the client values and needs, a relationship culture is firmly established in influencing success of the project delivery. Even though the construction manager considered that site formation and foundations required careful planning and attentive supervision as the project was complicated with a hill-side retaining wall, temporary footpath and a long-span transfer plate, he commented that once the transfer plate had been constructed, the high-rise structure above the podium level would present no difficulty to them.

Case 2 - This project is a residential development set on top of existing premises with several blocks of high-rise structure above the podium level. The contractor won the project with competitive tendering with a semi-public client. The contractor abides to the rules and regulations of a public project and maintains a trust culture in compliance with the client's needs and in fulfilling the procedural requirements. The top management of the contractor trusts their staff and provides training whenever possible to help the operational staff to understand the client's needs and the procedural requirements of a public client. The managerial staff is committed to produce not only a quality building, but also an environmental friendly site, and attempts to fulfill its business objectives by exploring new construction methods or improvements in construction detailing through seeking building materials from different sources. The site activities are well planned beforehand and the safety requirements are fully observed. Separate site offices are allocated to the subcontractors, and with a group of experienced supervisory staff and a comprehensive supervision plan, the works are well looked after even though a deep transfer plate with footprints of 500 square meter plus has to be constructed by phases. The contractor also commented that the typical high-rise structure above the podium level to them is a matter of counting the days for completing each floor level and then by blocks. The critical success factor mentioned for this project was the trust culture for a group of experienced staff and appropriate leadership at the top.

## **9. Commentary to the Project Cases**

There is no competitive bidding in Case 1 and the business model is an umbrella system. It is an integrative approach for property development and the model is viable because it is a private development in which the planners also participate in the implementation process. The general principles of supply chain such as, defining client's value, establish supplier relationships, integrating project activities, managing costs collaboratively, develop continuous improvement and mobilising and developing people, can all be observed in this case; whereas the business objectives are met because of the organisational

structure. Collaboration among all the participants has been made possible by this umbrella structure, from suppliers to customers. While there are no competitors but a set of rules to enable participants to share risks and benefits, the contracts are used as guarantees for best work practices between partners.

Case 2 is a conventional project in which the client and the contractor are separate entities, but the contractor has a good understanding of the requirements of a public client and has taken steps to ensure the implementers understand that too. Even though supply chain is not a formal model adopted and the traditional contractual arrangements are still in use, it can be observed that the supply chain model is practised with construction management approach to fulfill the functional and relational requirements of the project delivery system. Since the contractors in the two project cases have long been established locally and non-locally, they have already identified their trading partners and are able to make deals either with concessions or with real benefit to their partners to ensure that both stand to gain such as in benefit trading.

The projects are organised in a way to fulfill the functional requirements and the relationship aspect of construction projects. Whether a standard contract is used or an in-house contract is adopted, the contractors in both cases have a clear understanding of the client's expectations and needs and have taken steps in the process to improve such understanding either by training or by regular meetings. Although project cases for public private partnership has not been included in this study, it clearly indicates that some forms of partnership has to be established between the client, the contractor and the consultants to influence success of the project delivery system. Some critical success factors such as appropriate leadership, experienced and committed personnel are found in the case studies. These would help the workforce to be better prepared for project complexities, uncertainties and problems encountered during the project delivering process. Appropriate reward and incentive schemes are also advisable to motivate good and experienced staff as it is noted that the people interviewed are all happy with their 'employers' who show concern for them and their team members who work for them for quite some time.

## 10. Conclusions

The construction industry has long been described as fragmented and backward but its operational customs and practice may have their merits. To ease the tensions of a challenging job and to maintain good relationships among the stakeholders, collaboration and relationship approach has been practised for the management of complex projects, which are not uncommon nowadays. Good relationships are based on acting with trust in a coordinated way in the pursuit of shared goals. Although supply chain, benefit trading or strategic alliance are not the formal arrangements in these case studies, they can however be observed in their own unique way in addressing the relationship issue with diversified needs, interests, expectations, risk and constraints of the trading partners and make construction procurement business sound for human nature. Besides formulating plans and policies for the finance initiatives, the land resources, the ownership, the management and maintenance of the facilities, the partners in a public private partnership should consider integrating planning and implementation to influence success of a project.

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