COLLABORATIVE RESEARCH - BETTER VALUE FOR CONSTRUCTION

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Abstract

A Harvard Business School professor Jeffrey Sachs recently announced in the World Economic Forum that Hong Kong has slipped to 13th place from seventh in its macro-economic competitiveness index (Pritchard, 2001). Analysis by the Construction Industry Review Committee (CIRC) also found that the average construction cost for producing high quality high-rise office buildings is some 49% more expensive than that in Singapore (CIRC, 2001).

Traditionally, the industry has a fragmented structure and as a result the construction process is not conducive to the effective delivery and promotion of research and development with a client focus. What is needed is a collaborative model, which harnesses the concerted efforts between the industry and academia towards serving Hong Kong’s future needs.

This paper presents a Construction Industry Institute (CII) model, which is established recently in Hong Kong to help the industry to work in collaboration with the local research community. The mission of the newly established organisation, the Construction Industry Institute, Hong Kong (CII-HK) will be discussed. Its operational model and governance structure will be described. A framework of research interests consistent with the CII mission will also be presented.

Keywords
Collaborative research, Construction Industry Institute.

INTRODUCTION

The productivity, efficiency and competitiveness of building and construction are of critical importance to the growth and success of the Hong Kong economy and business (Rowlinson & Walker, 1995; Walker, 1995; Chan, 1996). In 2000, it accounted for 5.3% of the Gross Domestic Product (GDP) (Online 1) and 34.8% of gross domestic fixed capital formation (Economics Prospects, 2001). 9.4% of our workforce was employed by the construction industry in that year (C&SD, 2001). The construction industry is a foundation to the Hong Kong’s economy structure.

In April 2000, the Chief Executive of the Hong Kong SAR appointed the Construction Industry Review Committee to comprehensively review the current state of the industry and to recommend improvement measures. The Committee submitted its report to the government in January last year. The Committee reports that the construction industry, which covers new engineering and building

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projects, maintenance and renovation works as well as decoration activities, is one of the main pillars of Hong Kong’s economy (CIRC, 2001). The total actual expenditure on major infrastructure projects undertaken by both the public and the private sectors during the period from 1990-91 to 1999-2000 amounted to about $400 billion. Over the same period, a total of 650,000 new housing units in both the public and private sectors have been built to cater for the needs of an expanding population. Since 1990, the industry’s contribution to GDP in percentage terms has been in the range of 4.9% to 6%, indicating the sustained importance of the construction industry as a backbone of the local economy (CIRC, 2001). However, Hong Kong has slipped to 13th place from seventh in its macro-economic competitiveness index (Pritchard, 2001). Analysis by the Construction Industry Review Committee also found that the average construction cost for producing high quality high-rise office buildings is some 49% more expensive than that in Singapore (CIRC, 2001). This extra 49% contributes neither to quality nor to extra performance of the end product. A quantum improvement in industry performance is required if Hong Kong is to remain competitive on an international scale.

It is generally accepted that a collaborative effort between the industry and the local research community could make significant contribution to improve industry performance. However, the Hong Kong construction industry undertakes a negligible amount of research and development (R&D) activities when compared with its international competitors, which invest up to 2.8% of turnover in business research (Gussey, 2001). The size and diversity of our construction economy preclude R&D on any meaningful scale by individual companies or agencies. What is needed is a collaborative approach, which ties together the energies of the sector and coordinates research effort towards serving Hong Kong’s future needs.

This paper presents a Construction Industry Institute (CII) model, which is established recently in Hong Kong to help the industry to work in collaboration with the local research community. The mission of the newly established organisation, the Construction Industry Institute, Hong Kong (CII-HK) will be discussed. Its operational model and governance structure will be described. A framework of research interests consistent with the CII mission will also be presented.

PROBLEMS THAT THE INDUSTRY IS FACING

Construction is a very competitive and risky business. Its competitive nature, coupled with the conflicting objectives of participants in construction processes and the increasing reliance on penalty clauses by clients when formulating contract documentation, have posed a number of shortcomings to the industry. Many within the construction industry, in the past, have suffered as a consequence of litigation or arbitration proceedings whilst attempting to resolve difficulties that were hitherto encountered. The adversarial relationship between clients and construction contractors inherent in traditional project delivery is one of the major hurdles that have jeopardized the success of construction projects. The Construction Industry Review Committee identified the followings as the key problem areas affecting the local construction (CIRC, 2001):

- Poor site safety record
- Unsatisfactory environmental performance
- Need for a more client-focused approach
- Extensive use of traditional and labour-intensive construction methods
- An inadequately trained workforce
- Tendency to award contracts to the lowest bidders
- Short-term attitude to business development
- Non value-adding multi-layered subcontracting
- Declining productivity growth and high building cost
- Fragmentation and adversarial culture within the industry
These shortcomings are highlighted in the Executive Summary of the CIRC Report:

“Local construction activities are labour-intensive, dangerous and polluting. Built products are seldom defect-free. Construction costs are comparatively high. The industry is very fragmented and is beset with an adversarial culture. Many industry participants adopt a short-term view on business development, with little interest in enhancing their long-term competitiveness. There is a tendency to award contracts to the lowest bidders and delivery programmes are often unrealistically compressed. Accountability is undermined by the prevalence of non-value adding multi-layered subcontracting and lax supervision. An inadequately trained workforce also impairs the industry’s ability to adopt new technologies and to cope with new challenges”. (CIRC, 2001, p.1)

STRATEGIES FOR IMPROVEMENT

To achieve a marked improvement to construction performance, the CIRC advocates that the construction industry needs to develop a new culture that focuses on delivering better value to the customers on a continuous basis. The CIRC has identified a vision of an integrated construction industry that is capable of continuous improvement towards excellence in a market-driven environment. The Committee advocates an integrated approach to construction with an emphasis on teamwork in order to achieve the best project outcomes. The Committee further recommends a package of improvement measures covering the following areas to transform the construction industry (CIRC, 2001):

- Fostering a quality culture;
- Achieving value in construction procurement;
- Nurturing a professional workforce;
- Developing an efficient, innovative and productive industry;
- Improving safety and environmental performance; and
- Devising a new institutional framework to drive the implementation of the change programme for the industry.

Amongst other things, the Committee opines that research is a key driver to steadily improve the overall performance of the construction industry through technology upgrading. Investment in construction research should be significantly increased to promote an innovation culture in the industry. The Report further recommends that the industry and the local research community should work in collaboration to set clear objectives, directions and priorities for local construction research, to raise awareness of research results and to facilitate their practical application (CIRC, 2001).

To respond to the Committee’s recommendation, a Construction Industry Institute (CII) model is proposed to help the industry to work in collaboration with the local research community.

THE NEW INITIATIVE

The name of the organisation is the Construction Industry Institute, Hong Kong “CII-HK” and it is a joint initiative developed by the industry and the academia pioneered by the Hong Kong Housing Society and the Hong Kong Polytechnic University.
Its principal funding is derived from unrestricted grants and donations and by recurrent membership subscriptions of sustaining member companies associated with the construction industry in Hong Kong.

The CII-HK comprises a membership base of owners and contractors who have a mission to develop a strong alliance with academia. The objective is to identify problems within the construction industry and to work together through research and implementation to provide solutions that will enhance the competitive advantage of the industry in local and international markets.

The CII-HK is modelled on the Construction Industry Institute based in Austin, Texas, which was founded in 1983. The CII-Texas is a consortium of 90 corporations that are either users or builders of constructed facilities (Online 2). The CII-Texas funds research projects at 30 U.S. universities to identify "best practices" that help fulfill its mission: to improve the total quality and cost effectiveness of the construction industry. The success of the CII-Texas has attracted global attention. Other institutes have been established in the Europe and Australia and formal links are in the process of being established with them. We in Hong Kong are in a very fortunate position to be able to apply the knowledge gained by the other three institutes worldwide and adapt that to the Hong Kong environment. Both the European Construction Institute (ECI) and the Construction Industry Institute, Australia (CII-A), which were founded in the early 90s, whilst based on the CII-Texas' research and administrative model have been adapted to suit local conditions (Online 3; Online 4).

The international network comprising the three established institutes plus the local CII-HK, will give us global exposure in promoting the local industry as having a strong emphasis on international construction.

MISSION STATEMENT

The mission of the Construction Industry Institute, Hong Kong (CII-HK) is to improve continuously all aspects of safety, quality, cost effectiveness and environmental performance of construction through innovation and collaboration in research and implementation by the industry and academia. CII-HK is a non-political, not-for-profit organisation established to offer solution-oriented strategies for the advancement of the construction industry in Hong Kong.

OPERATIONAL MODEL

The Institute provides a forum promoting a strategy of co-operative research directed towards real and practical issues, which are of direct benefit to the quality of service, cost effectiveness, and competitiveness of the Hong Kong construction industry. The essence of this thrust is an Institute in which there is a direct link between owners, industry and research groups for the establishment of priorities, approval of research and subsequent flow of benefits.

In most cases research will be conducted by task forces specifically organized for the purpose. Task forces will direct research, supervise the preparation of position papers and recommend implementation strategies. In this process the Institute draws on the staff of member companies, the academic community and other allied organisations that are active on similar issues (Figure 1).

The research community participates both as a source of consultants and of resources, undertaking most of the research and development required. The task force approach, capitalizing on the participation, commitment and expertise of experienced member company personnel, provides the principal strength of the Institute.
The Institute further provides a forum to enable its members to meet on a regular basis, share experiences of their innovations, learn from others and foster a culture of continuous improvement.

Figure 1: Operational Model of CII-HK
Source: Adopted from Lenard, 2001

MEMBERSHIP AND BENEFITS

The membership of the Institute may be diversified as to size, and industry sector and members may represent a cross section of thinking on the important challenges facing the industry.

Membership is open to proprietors, professionals, companies, manufacturers, suppliers and public agencies concerned with the construction industry embracing the total project delivery process. A balance between membership groups will be maintained, so that members represent a broad view of the industry. Benefits of membership can be many folded and include but not limit to the followings:

- Industry driven collaborative research
- Access to innovative practices
- Toolkits and guidance documentation to improve efficiency
- Being placed to reap the rewards from increased productivity and profitability
- Networking with all disciplines within the industry
- Being part of a forum that sets standards across the industry
- Being recognized as having a genuine desire to improve continuously
- Increased profile, marketability, peer and media interest

GOVERNANCE STRUCTURE
The CII-HK has adopted a governance structure, which is referenced upon the best practices in today's corporate governance while retaining the uniqueness of the CII as an independent organisation governed by members. The structure consists of a Governing Council and an Executive Board, Directorate and Secretariat (Figure 2).

The Governing Council is responsible for the formulation of the CII-HK’s mission and its guiding principles. The Executive Board establishes policies to ensure that corporate strategies are consistent with the agreed guiding principles and oversees the performance of the Directorate and Secretariat. Members of the Governing Council shall be Donors or their nominees meeting prescribed criteria. The Governing Council elects members of the Executive Board from the Subscribing Members. The Executive Board shall be answerable and accountable to the Governing Council. The Executive Director, being nominated and appointed by the Executive Board, shall head a Secretariat comprising the Director (Research), the Director (Membership) and the Director (Finance) together with a small group of supporting staff. The Director (Research), the Director (Membership), and Director (Finance) shall be nominated by the Executive Director for appointment by the Executive Board. The Executive Director and the Director (Research) shall be official members of the Executive Board.

Members of the Governing Council and the Executive Board shall contribute to the CII-HK on a voluntary basis.

POSSIBLE RESEARCH AREAS

A major CII-HK objective is that all research conclusions should be implemented by the industry. A framework of research interests consistent with the CII-HK mission is being developed. Projects within this framework will be pursued as priorities are established by the Executive Board. The framework embraces the principal determinants of successful construction (Figure 3):
• Key performance indicators and benchmarking
• Impact on the environment during construction and operation
• The use of innovative techniques during construction
• Process improvement and construction process re-engineering
• Partnering and strategic alliances
• Quality enhancement and value management
• Construction contract and construction liability
• Construction Automation and Technology
• Computer Aided Design/ Drafting and 3D Modelling
• IT for project and construction management practices

All projects will have as their outcome a specific product that will improve quality, cost-effectiveness, productivity or competitive advantage. The CII-HK also recognizes the importance of the implementation of results. Included in the implementation activities will be a series of workshops and seminars. It is expected that task forces will make presentations to industry groups on CII-HK research.

CONCLUSION

The productivity, efficiency and competitiveness of building and construction are of critical importance to the growth and success of the Hong Kong economy and of Hong Kong business. In 2000, it accounted for 5.3% of the GDP (Online 1) and 34.8% of gross domestic fixed capital formation.
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(Economics Prospects, 2001). 9.4% of our workforce was employed by the construction industry in that year (C&SD, 2001). Almost every other industry depends on the structures created by construction. The construction industry is a foundation to the Hong Kong's economy structure. Improvements in efficiency and effectiveness flow through to the economy and enhance international competitiveness (Sidwell, 1994; 1995). Stoeckel and Quirke (1992) estimate that a 10% lift in efficiency in construction would boost the GDP by 2.5%.

Traditionally, the industry has a fragmented structure and as a result the construction process is not conducive to the effective delivery and promotion of research and development with a client focus. The Hong Kong construction industry undertakes a negligible amount of research and development (R&D) activities when compared with its international competitors, such as Sweden, which invest up to 2.8% of turnover in business research (Gussey, 2001).

The size and diversity of our construction economy preclude R&D on any meaningful scale by individual companies or agencies. What is needed is a collaborative model, which harnesses the energies of the sector and coordinates research effort towards serving Hong Kong's future needs. A significant improvement in industry performance is required if Hong Kong is to effectively respond to its infrastructure needs and if major opportunities are to be captured and export opportunities realized.

The new initiative to set up the CII-HK, which is an industry-driven research organisation, is one of the key drivers to steadily improve the overall performance of the construction industry.

REFERENCES