2nd ASIAN FORUM ON:

Region-specific issues related to built environments and housing in Asia - Singapore

Singapore Construction Information Standardisation Initiatives:
Classification of Cost & Resources

January 21-23, 2003

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an industry partnership supported by PSB and IDA

Outline of Seminar

PART 1:

- **Nature of the construction process**
- **Computer-Integrated-Construction (CIC)**
- **Information standardisation: specification and classification**
  - **International standards**
  - **Singapore standards**
- **Benefits and costs of standardisation**
- **Industry views on standardisation**

Outline of Seminar

PART 2:

- SS CP80:1999 (Classification of Cost Information)
  - Purpose
  - Contents
  - Application
- CRCS / SS CP93:2002 (Classification of Resources Information)
  - Purpose
  - Contents
  - Application

Nature of the Construction Process

The construction process is characterised by:

- **a large number of participants from different backgrounds who co-operate to achieve the specific aims of a particular project.**
- **a construction activity comprises a series of interrelated subtasks performed by small groups of practitioners, and the tasks are generally undertaken in an atmosphere of uncertainty, in different geographical locations and under varying organisational circumstances.**

Nature of the Construction Process

- **the groups work towards achieving the same objectives under identical time and financial constraints, they all start from the same basic information about the client's requirements.**
- **a substantial amount of additional project information is generated in the course of work.**
- **owing to the inter-dependent nature of the tasks, the results of one team's effort constitute inputs to those of another or other group(s), several channels of communication are required.**

Nature of the Construction Process

In summary:

Breakdown in communication can be attributed to construction practitioners having different backgrounds and interests …; the large volume of information generated and the variety of formats in which the different participants require them act against effective communication.

Information Standardisation

Why standardise?

"Unorganised information is difficult if not impossible to access and is therefore as good as lost. On the other hand, a properly organised information store, based on a common language, guarantees timely access for users and speedier transmission and exchange. …"

Information Standardisation

"Organised and freely accessible information would optimise the deployment of scarce manpower for increased productivity and help to make our highly diversified and fragmented construction industry more efficient." (Lee *et al*., 1989) …it also allows for interoperability between/among firms.

Information Standardisation

Two key attributes of a useful information classification system are:

1. **Common public domain information classification standards used and understood by as many as possible on a national or international basis.**

2. **Be capable of supporting communication in all the three generic channels of communication between**
   - **man and man,**
   - **man and machine, and**
   - **machine and machine.**

- Lee *et al*., 1989

Use of IT

IT is used to describe:

"all manners of computer and telecommunication technologies applied in the acquisition, storage and retrieval of information. And, information can take a variety of forms – numerical data, graphical, documents, image or voice – the technologies needed are also equally varied."

- Betts et al., 1989

Computer-Integrated-Construction

IT plays a vital role to integrate construction both vertically and horizontally and is widely recognised as a key-enabler of the integration of data, process, participants, etc. on a building project life cycle.

Computer-Integrated-Construction

The three approaches to facilitate CIC are:

1. **Computer-aided-design (CAD)**
2. **Information classification in construction**
3. **Conceptual building model.**

Information Standardisation in the Construction Industry

- CAD
- Specification
- ➢ Cost Information
- ➢ Product Information

Some International Standards

- **CI/SfB (UK), 1976**
- **CSI Masterformat (US), 1995 ed.**
- **BSAB (Swedish), 1996 3rd generation**
- **Unified Classification for the Construction Industry, or UNICLASS (UK), 1997**
- **ISO 12006-2 (Int'l), 1997**
- **OVERALL CONSTRUCTION CLASSIFICATION SYSTEM (OCCS) - UNDER DEVELOPMENT**

Singapore Standards

National Efforts:

- **National Standardisation Programme (NSP)**
  - **PSB (now SPRING S'pore) co-ordinates the NSP**
  - **NSP is guided by an industry-led Singapore Standards Council**
  - **Council has appointed 11 Council Committees**
  - **National IT Standards Committee (NITSC)**
    - **supported by PSB, IDA**

Singapore Standards

NITSC's mission (formed in 1990):

"To spearhead the formation of Singapore's national IT standards to support the establishment of Singapore as an IT and business hub."

Singapore Standards

The formation of the Construction Industry IT Standards Technical Committee (CITC) in 1998 is an industry effort to prepare the Singapore construction industry for the IT age of the 21st century.

CITC's mission:

"To establish an industry-wide framework for the development and adoption of IT standards in the construction area."

Singapore Standards

Some developed Singapore Standards include:

- **SS CP80:1999 – Classification of Construction Cost Information**
- **SS CP83:2000 – Implementation of Computer-aided design (CAD) Standards**
  - **Part 1: Organisation and naming of CAD layers**
  - **Part 2: CAD symbols**
  - **Part 3: Organising and naming of CAD files**
  - **Part 4: CAD drafting conventions**
  - **Part 5: Colour and Linetype**
- **SS CP93:2002 – Classification of Construction Resources Information**

Singapore Standards

Some new efforts in Construction IT Standards development:

- **Electronic Measurement Standard**
- **Object-Oriented CAD Standard**

Benefits of Standardisation

- **Common language to lessen diversity (and dispute).**
- **Duplication of work is reduced (within and across disciplines/firms).**
- **Increased familiarity with a uniform format.**
- **Computerisation is made possible.**
- **Raise efficiency and productivity (of firms and the whole industry).**

Costs of Standardisation

- **Historical data requires time and cost to re-classify.**
- **Mindset is difficult to change (standardisation means compromise).**

Some aspects of compromise:

- **Lost of competitive edge.**
- **National standard may not be comprehensive.**
- **National standard may not be kept up-to-date.**

Industry Views on Standardisation

Interviews conducted by Chu Yee Lean, BSc (Bldg) Hons, NUS, 2000/01

"The players have all along been working in isolation. Each has its way of doing business. As a result, the industry has been lagging behind other sectors in terms of productivity and performance. A standard to govern how each player behave and work will without a doubt allow the industry to progress and improve."

Industry Views on Standardisation

"In order for (standardisation) to realise its objectives, the industry must first unite as one. When there is cohesiveness, changes can be implemented easily."

Industry Views on Standardisation

"This initiative is a good start to enhancing the industry's performance. But, in order for it to fulfil its role, the respective players in the industry must change."

Industry Views on Standardisation

"The Construction Industry in Singapore will make a great leap in terms of information exchange and quality service. It will be a more productive industry relying on better technology in their work execution. This is very true as we are moving into the IT age. Everything must be fast and accurate."

End of Part 1