University of Seoul (South Korea)

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Vice President, KICEM (Korea Institute Construction Engineering and Management)
Chairman, KCVE (Korea Construction Value Engineering)
1. Industry iteration in teaching
2. Industrial interaction in research
3. Industry placement and internships for MS/PhD students
4. Percentage of PhD students in academia versus industry upon graduation
1. Industry interaction in teaching
1.1 Purpose of Department (Archi. Engrg.)

Prepare opportunity to study overall construction process, from feasibility study to maintenance and demolition

Cultivate global leadership in the Construction Engineering and Management

Nurture prosperous engineer based on innovative program, various practical experience, and extramural activities
1.2 Department History

CEM Program : From 1997~ (15 years)

1975 Inauguration of Architectural Engineering Department
1982 Inauguration of the Masters program in the Graduate School
1985 Inauguration of the Ph.D program in the Graduate School
1996 The Programs in Architecture and Architectural Engineering were reestablished as 4-year programs in the newly formed Faculty of Architecture, Urban Planning and Landscape Architecture in the College of Urban Science
1999
2000 Department of Architecture and Department of Architectural Engineering established
2002 Inauguration of the 5-year Program in Architecture
2003 Department of Architecture and Department of Architectural Engineering established as Independent programs in the Graduate School
Start to prepare ABEEK (Accreditation Board for Engineering Education of Korea)
2005 Reorganization into School of Architecture and Architectural Engineering
2009 Receive the Accreditation of ABEEK

CEM Program : From 1997~ (15 years)
The Department of Architectural Engineering offers one of the most diverse graduate programs in Korea, at both Master and Ph.D. level. There are currently nine research laboratories in the department.

- Construction Engineering and Program Management
- Construction Management & Information Laboratory
- Building Energy Environment Laboratory
- Laboratory of LCCA and FM & IM
- Laboratory of Reinforced Concrete Structures etc.
- Laboratory of Structure safety estimation
- Laboratory of Steel & Composite Structure
- Laboratory of Architectural Acoustics
- Laboratory of Building Vibration Control
1.4 Research Subjects in CE&PgM Lab.

01. Construction Policy
02. Value Engineering (VE)
03. Life Cycle Cost (LCC)
04. Cost Management
05. Cost & Schedule Integration
06. Earned Value Management Systems (EVMS)
07. Project Delivery Systems
08. Contract and Claims
09. Program Management Information System (PgMIS)
10. Risk Management
11. Quality Management
12. Facility management
13. Infrastructure management
1.5 Subjects of Industry Interaction in Teaching

01. Design & Construction Integration
02. Sustainable Building Material
03. Building Maintenance
04. Feasibility Study & Project Financing
05. Construction Safety Management
06. Risk Management
07. Construction Decision Making
08. Advanced Construction Quality Management
09. Construction Law & Policy
10. Construction Information Management
2. Industry interaction in research
2.1. Recent Research

2.1.1. Industry Collaboration

Owner

Contractor/Builder

CMr/PgMr

A/E

University of Seoul

CEM Program

Problems / Raw data

Solutions / Information

...
A research on estimating fair construction cost and establishing management system

- Focused on public Multi-family housing and office buildings -

Ministry of Land, Transportation & Maritime Affairs
2.1. Recent Research

2.1.2. Recent Research : 5W2H

1. Who?
Participation of the Highest Level Construction Cost Managers
-Leader : Univ. of Seoul
-Total : 8 org.

2. When?
SEP 2006 ~ MAY 2011 (4 years and 8months)

3. Where?
1) Cost Budgeting in Multifamily Housing Projects
2) Public Office Building Projects

4. What?
the Development of Fair Construction Cost Estimating System

5. How?
a Practical and Theoretical Approach

6. Why?
to Reduce Expected Accuracy Range(%) :
As Is.. -30 ~ +50  To Be.. -15 ~ +15

7. How much?
$ 2,000,000 ($2.2 Billion)
2.1. Recent Research

2.1.3. On going Research

Title

Program management system for mixed-use urban regeneration

i-PgMIS : intelligent program management information system

Korea Urban Renaissance Center,
2007 MLTL R&D High-Tech Urban Development Program
2.1. Recent Research

2.1.3. On going Research : 5W2H

1. Who?
Participation of the Highest Level CEM Specialist.
-Leader : Univ. of Seoul

2. When?
DEC 2007 ~ Apr 2014
(6 years and 4 months)

3. Where?
Mega Projects or Multiple Projects

4. What?
the Development of Intelligent Program Management Information System

5. How?
Practical and Theoretical Approach

6. Why?
1) 10% reduction in capital and maintenance cost respectively
2) 20% reduction in the program duration

7. How much?
$ 10,200,000 (₩ 11 Billion)
2.1. Recent Research

2.1.3. On going Research : i-PgMIS Concept

- MLTM
  - UR Web Center
  - Program Status
  - Notice
  - Legislation Check
  - Related News

- Local Government
  - Stakeholder's System
  - Web Control Center
  - Budget & Cost Situation
  - Schedule & Performance Situation
  - Standard Breakdown Structure & Authority Control

- UR Program
  - Program Portal System
  - Procedure based Manual
  - Visual based Program Definition
  - Platform Level Integration
  - System & Menu Creation

Program Portal Creation & Control System

- Cost Mgt., Execution Mgt.
- Duration Mgt., Progress Mgt.
- Risk Mgt., Performance Mgt.
- Conflict Mgt., e-Manual
- Green Mode Planning Phase VE

Cost Mgt. System
- Duration Mgt. System
- Risk/Performance Mgt. System
- e-Manual
- Green VE/LCC
- Change/Contract Mgt. System
2.1. Recent Research

2.1.3. On going Research : Necessity of i-PgMIS

Mega-projects around the World

- Millennium Dome
- Tokyo Midtown
- Marina Bay Sands
- Boston Big Dig
- Yebisu Garden Place
- Roppongi Hills
2.1. Recent Research

2.1.3. On going Research: Necessity of i-PgMIS

- **Yongsan**: $23 billion, Schedule Delay
- **Eunpyeong**: $1.4 billion, Schedule Delay
- **Dongtan**: $1.5 billion, Schedule Delay
- **Smart-City**: $0.7 billion, Cost Overrun
- **Pentaport**: $1.4 billion, Schedule Delay
- **Cheongnyangri**: $1.2 billion, Conflicts among Participants
- **Sewoon**: $1.0 billion, Feasibility Declining, Schedule Delay
- **Alpha Dome**: $2.5 billion, Schedule Delay

*Mega-Projects in Korea*
### 2.2 Industry Participation for Research

#### 2.2.1. Research Group

<table>
<thead>
<tr>
<th>UR Business Model</th>
<th>Electronic Manual For UR PgM</th>
<th>Mixed-use UR PgM Tech.</th>
<th>Program Cost&amp;Schedule Management</th>
<th>System Integration (i-PgMIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seoul National Univ.</td>
<td>NamSeoul Univ.</td>
<td>Univ. of Seoul</td>
<td>Kunwon Eng.</td>
<td>Hanyang Univ.</td>
</tr>
<tr>
<td>Prof. C.M.Jung</td>
<td>Prof. B.S.Son</td>
<td>Prof. C.T.Hyun</td>
<td>Dr. Y.C.Seo</td>
<td>Prof. J.H.Kim</td>
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**Mixed-use UR PgM System**
- P.I.: Prof. C.T.Hyun [Univ. of Seoul]

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**Industry Participation**

- Daewoo E&C, Daelim Industrial, Hanhwa E&C, HDC, Korail, KCVE
- Delco Realty Group, R2Korea, Infiai-Tech., Fides Dev., Fides PMC,
- Gansam Partners, Geoseong ENG, Geunjeong A&E, Dongil A&E, Mooyoung Amecs, Baum ARC.,
- Topec Eng., Parsons Brinkerhoff, Haud Eng., KCM, Haenglim Arc., Hyewonkaci Arc.,
- Heerim Arc., GTS E&C, HKCMC, ITM CO.,
- UMI, Han-A Urban Research institute., NOA Tech., DDR Soft, OPENmate Co.,
- Woodai CALS, Umid System, Geont
2.2 Industry Participation for Research

2.2.2. Field of experts

- CERIK, KCVE
  - KICT, etc.
- Purdue, Colorado, HK Polytech.
  - UIUC, Tongji, Nanyang, etc.
- VirtuAlmighty, LRC2
  - ICCE, etc.
- MLTM
  - Seoul/Incheon etc.
- LH, SH
  - BMC, Ansan Ecocity, URA, etc.

Megaproject CM System

- Consulting
- IT
- Finance
- E&C
- A&E
- CM
- R&D
- Public Co.
- UD
- Gov.

- Sang-Ah Mgt., NOA Tech., DDR Soft
  - Geont, HKCMC, Woodai CALS, Korea Biz Tech etc.
- KDB, KB
- Daelim Industrial, Daewoo E&C
  - Hanhwa E&C etc.
- Samoo, Junqlim, Heerim, Haenglim
  - Dongil, Mooyoung, Jungwoo, Geunjeoung, Hudigm etc.
- Konwon, Topc, Gansam,
  - ITM, GTS, Tomoon etc.
- CH2MHILL, JOCOBS, PBK
- Shinyoung, Infini-Tech.
  - Mori, Matsui, etc.
3. Industry Placement and internship for MS/PhD student
3.1 Industry Education

- **VE basic course**: 6-8 Students a year
- **VE advanced course**: 2-3 Students a year

The Korean Professional Engineers Association

- **CMP (Construction Management Professional) course**: 1-2 PhD students a year
3.2 Internships

- Construction Company: 1-2 students a year

- Korea Construction Value Engineering Research Institute: 1-2 students a year
3.3 International Collaboration

University of Seoul (Korea)

ACBC Workshop
(Asian Coalition for building Construction)

HK Polytech University (HongKong)

Osaka University (Japan)
3.3 International Collaboration

**Future action plans**

- Expansion of industry internship to enhance CEM capability
- International student exchange program to experience global collaboration
4. Percentage of PhD students in academia versus industry upon graduation
Percentage of PhD students in academia versus industry upon graduation

- Academia: 67%
- Industry: 33%
Thank you