Setting the Research Agenda for the CEM Community

FORUM REPORT

11th-12th May, 2013

The Hong Kong Polytechnic University, Hong Kong
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1.0 MESSAGE FROM THE ORGANIZING CHAIRMAN

The 2013 GLF-CEM was organized by the Department of Building and Real Estate, Faculty of Construction and Environment, The Hong Kong Polytechnic University. I would like to thank all the delegates who made this event possible and congratulate them for the success of this forum. I would also like to thank our Executive Committee members for providing their invaluable support in making this event successful. Thank you for giving me the honor to organize the GLF-CEM this year. I hope you had a great time in Hong Kong.

I am glad to announce that all the discussion sessions that occurred at the GLF-CEM 2013 have successfully ignited fresh thoughts for the future of GLF-CEM. We have accomplished the previously stated objectives of setting a research agenda for the CEM community. Three topics including long-term fundamental/scientific research questions, research issues/theme/problems/topics in the next decade, and multi-disciplinary research collaboration were fully discussed and a certain consensus was reached for future development of CEM.

The events and their outcomes are documented in this report for your reference and use in future discussions.

Sincerely,

Geoffrey Q. P. Shen

Organising Chairman, The 2013 GLF-CEM,
Head of Department of Building and Real Estate
Associate Dean, Faculty of Construction and Environment
The Hong Kong Polytechnic University, Hong Kong
2.0 EXECUTIVE SUMMARY

The 2013 GLF-CEM was organized by The Hong Kong Polytechnic University, under the leadership of Professor Geoffrey Q. P. Shen between 11th and 12th May 2013. There were 17 participating members, 5 invited speakers, and 19 observers attending this forum. With the aim of setting a research agenda for the Construction Engineering and Management (CEM) community, three group discussions were held on 12th May 2013 to discuss long-term fundamental/scientific research questions, research issues/theme/problems/topics for the next decade, and multi-disciplinary research collaboration. Although the discussion did not reach a definite conclusion in the first group session, the fundamental/science questions to be answered by the CEM community were brought out much clearer after the discussion. Also, future trends in the next decade would not only be developed in the technology field like BIM, but also the collaboration towards multi-disciplinary research topics (mainly discussed in the second group). Education for qualification, asset management and sustainability in buildings would be the major trends in the next decade for research according to the discussion. Finally, it was considered that setting the right people on the right topic at the right time could be considered as the inadvertent agreement from all the participants. This would lead to further collaboration within the CEM community and make more contribution by allocating adequate resources to the issues all around the world.
3.0 LIST OF DELEGATES

3.1 Members

<table>
<thead>
<tr>
<th>NAME</th>
<th>POSITION &amp; INSTITUTION</th>
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<tbody>
<tr>
<td>1</td>
<td>Prof. Hans-Joachim Bargstäedt</td>
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<td>2</td>
<td>Prof. Luh-Maan Chang</td>
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<td>3</td>
<td>Prof. Dongping Fang</td>
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<td>Prof. Makarand (Mark) Hastak</td>
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<td>5</td>
<td>Prof. Charles T. Jahren</td>
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<td>6</td>
<td>Prof. Zhongfu Li</td>
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<td>Prof. Guiwen Liu</td>
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<td>Dr. Sebastian MacMillan</td>
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<td>Prof. S. Thomas Ng</td>
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<td>10</td>
<td>Prof. Geoffrey Q. P. Shen</td>
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<td>Prof. Liyin Shen</td>
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<td>12</td>
<td>Prof. Lucio Soibelman</td>
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<td>13</td>
<td>Prof. Guangbin Wang</td>
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<td>Prof. Jiayuan Wang</td>
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<td>Prof. Jan Wium</td>
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<td>16</td>
<td>Prof. Xiaolong Xue</td>
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<td>Prof. Saixing Zeng</td>
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### 3.2 Invited Speakers

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<tr>
<th>NAME</th>
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<tr>
<td>1 Prof. Kahui Chan</td>
<td>Chairman of the Departmental Advisory Committee, Department of Building and Real Estate, The Hong Kong Polytechnic University</td>
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<tr>
<td>5 Dr. Stanley K.C. Wong</td>
<td>Member of Departmental Advisory Committee, Department of Building and Real Estate, The Hong Kong Polytechnic University</td>
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<tr>
<td>2 Prof. Rodney Culver Hill</td>
<td>Presidential Professor, Piper Professor for Teaching Excellence, ING Professor of Excellence, Eppright University Professor, Harold L. Adams Interdisciplinary Professorship in Architecture, Texas A&amp;M University, USA</td>
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<tr>
<td>3 Prof. Jin-guang Teng</td>
<td>Chair Professor of Structural Engineering, Dean of Faculty of Construction and Environment, The Hong Kong Polytechnic University, Hong Kong</td>
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<td>4 Prof. Christopher To</td>
<td>Executive Director, Construction Industry Council, Hong Kong</td>
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### 3.3 Observers

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<th>NAME</th>
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<tr>
<td>1 Mr. Dongping Cao</td>
<td>PhD Candidate, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<tr>
<td>2 Dr. Jacky K. H. Chung</td>
<td>Instructor, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<tr>
<td>3 Dr. Hongqing Fan</td>
<td>Assistant Professor, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<tr>
<td>4 Dr. Patrick S. W. Fong</td>
<td>Associate Professor, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<td>5 Mr. Arshad Javeed</td>
<td>PhD Candidate, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<td>6 Ms. Weiyan, Jiang</td>
<td>PhD Candidate, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<td>7 Mr. Zhigang Jin</td>
<td>PhD Candidate, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong</td>
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<tr>
<td>8 Dr. Wilson Weisheng Lu</td>
<td>Assistant Professor, Department of Real Estate and Construction, The University of Hong Kong, Hong Kong</td>
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<tr>
<td>9 Ms. Chao Mao</td>
<td>Lecturer, Faculty of Construction Management and Real Estate, The Chongqing University, China</td>
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<td>10</td>
<td>Mr. Oladinrin Timothy</td>
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<td>11</td>
<td>Dr. Yuhong Wang</td>
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<td>12</td>
<td>Mr. Zezhou Wu</td>
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<td>Dr. Pengcheng Xiang</td>
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<td>14</td>
<td>Mr. Bo Xu</td>
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<td>15</td>
<td>Dr. Pengpeng Xu</td>
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<td>16</td>
<td>Dr. Gui Ye</td>
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<td>17</td>
<td>Dr. Ann T. W. Yu</td>
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<td>18</td>
<td>Dr. Xiaoling Zhang</td>
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<td>19</td>
<td>Ms. Lu Zhou</td>
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4.0 PROGRAM RUNDOWN

Saturday, 11 May 2013
12:30-14:30 Executive Committee Lunch Meeting
14:30-14:45 Registration of Delegates
14:45-14:55 Welcoming remark by the Organizing Chairman – Prof. Geoffrey Shen
14:55-15:45 Introduction by New Members
15:45-16:15 Tea/Coffee Break
16:15-18:00 Introduction by New Members
19:00-21:00 Reception Dinner

Sunday, 12 May 2013
08:30-09:00 Registration of Delegates
09:05-09:10 Welcoming Speech by the Organizing Chairman – Prof. Geoffrey Shen
09:10-09:15 Welcoming Speech by the GLF-CEM Chairman – Prof. Makarand Hastak
09:15-09:30 Opening Speech by the Dean of Faculty of Construction and Environment – Prof. Jin-Guang Teng
09:30-10:20 Keynote Speech by Prof. Rodney Culver Hill via Video Conference
10:20-10:30 Souvenir Presentation
10:30-10:45 Tea/Coffee Break
10:45-12:30 Session 1: Group Discussion on Long-term Fundamental/Scientific Research Questions
12:30-14:00 Luncheon and Talk by Prof. Christopher To
14:00-15:15 Session 2: Group Discussion on Research Issues/Theme/Problems/Topics in the Next Decade
15:15-15:30 Tea/Coffee Break
15:30-16:30 Session 3: Group Discussion on Multi-disciplinary Research Collaboration
16:30-17:10 Research projects for the GLF-CEM community – Prof. Makarand Hastak
17:50-18:00 Closing Remark by the Organizing Chairman – Prof. Geoffrey Shen
18:30-21:30 Dinner Cruise over Victoria Harbour
5.0 OVERVIEW OF THE FORUM

This forum was intended to bring together professors from leading universities around the world who play a leadership and/or administrator role in their respective programs. The objective of this forum is to establish a body of academic leadership in the area of construction engineering and management to discuss and share issues of common concern in research, teaching, academic administration, and opportunities for collaboration. The first meeting held in March 2011, in which the mission, membership criteria, and goals for this forum were established. The second meeting was held in May 2012, by additional new members and discussion on issues related to “graduate program and industry collaboration”. Based on the two successful meetings, the third meeting GLF-CEM 2013 was organized by the Department of Building and Real Estate, The Hong Kong Polytechnic University from 11th -12th May 2013 in Hong Kong.

The theme was “Setting a Research Agenda for the CEM Community”. Executive committee members decided the theme based on the outcome of group discussions during the second meeting. All new members were invited to introduce themselves and their CEM programs on 11th May 2013. They also shared their concerns on different issues such as difficulty of attaining funding, unavailability of resources, high ratios of students to faculty, and development of new programs.

The group discussions were held on 12th May 2013. The discussions were divided into three sessions to discuss three questions posted to the members. The questions consist of long-term fundamental/scientific research questions, research issues/theme/problems/topics in the next decade, and multi-disciplinary research collaboration for CEM. The participating members were asked to submit their thoughts on these issues based on their preferences. The members were invited to present their thoughts during the discussion sessions. The moderators were appointed during each session.

Two distinguished speakers delivered excellent and thought-provoking speeches on 12th May 2013. Prof. Rodney Culver Hill, from Texas A&M University, USA, talked about the future visions of CEM. With an impressive opening of metaphor for the life of earth for a year of 365 days long, Prof. Hill led the members from ‘Jan 1st’ when the earth was a boiling form of fire to the very last 2/3 second of the ‘year’ in the life of earth. Current thinking shows that the peak time of food and energy consumption would appear in the following few decades. Saving energy would be an extremely important topic in the near future and buildings would be required to be built self-sustainable for low energy consumption and water usage etc.
During the lunch, Prof. Christopher To, Executive Director of Construction Industry Council (CIC), Hong Kong, gave a luncheon talk overview of the construction industry in Hong Kong and the developments regarding CIC research funding grants. In his presentation, Prof. To presented major infrastructure projects in Hong Kong, and led discussion on Zero Carbon Building and BIM technologies. His presentation then highlighted the construction expenditure forecast, industry performance report for 2011, future direction for 2013-2018 and roles of the CIC in supporting industry research. Two major approaches in supporting research activities, in terms of investing and collaborating with research institutes, were also introduced. Prof. To highlighted the eligible criteria (cost-effectiveness, project implementation and value of research project) and assessment framework when applying for CIC research funding grants.
6.0 GROUP DISCUSSION

As mentioned earlier, the group discussions were divided into three sessions. Each group had specific objectives and related discussion points based on the workshop topic. The moderator of each group chaired the discussion and made a summary at the end of each session. Group discussion would provide insights for certain needs and issues that this forum can address through future activities.

6.1 Session1 Group Discussion

Subject:
What are the long-term fundamental/scientific research questions to be answered by the CEM community?

Presenters
Prof. Dongping Fang (Moderator), Prof. Xiaolong Xue, Prof. Hans-Joachim Bargstäedt, Prof. Zhongfu Li, Prof. Makarand Hastak

Group Discussion

Question brought up: What is the science behind CEM?
Before discussing the question, Prof. Dongping Fang brought up the fundamental questions about people/social needs and the environment to be built and constructed by use of emerging technologies.

Fundamental Questions:
- Is there a theory behind CEM concepts? If yes, what is it?
- Is there science behind CEM concepts? If yes, what is it?
- Is there a need to define theory and/or science behind CEM?
- What should be the correct approach to answer these questions?

After the fundamental questions were taken out for the discussion, members presented their own views towards what kind of research CEM can be referred to the long-term fundamental/scientific research questions.

To begin the group discussion, Prof. Xiaolong Xue summarized the development of CEM research which had already taken more than 30 years with more than 16 academic journals and 16000 published papers. He proposed that for bridging the gap
between theory and practice, identifying the mechanisms and research paradigm is the first step. Longitudinal and multi-level approaches would also be necessary in theoretical studies. Measurement of the relationships of factors and their impacts on DOICW (Decision, Organization, Innovation, and Collaborative Working) would be helpful for researchers in CEM to better understand each other.

Then, Prof. Hans-Joachim Bargstäedt shared his thoughts on the long-term fundamental/scientific research questions. He recommended that the CEM community should pay attention to the following issues: develop knowledge-based construction management methods, introduce neural network technologies into construction and into simulation of construction, improve workers’ health and safety issues, reduce hard labor conditions, develop better lifecycle models, which include long-term effects (maintenance and demolition) as well as ecological construction issues, and merging of national building processes within one internationally standardized building scheme.

After that, Prof. Makarand Hastak highlighted the existing divisions within the academic areas when people proposed research within CEM, such as: Basic Science, Environmental Science, Social Science, Engineering, Management, or Economics and key words captured by the ASCE Journal of Management in Engineering. The answer for which is best for CEM research could not be certain at the early stage.

While discussing the concepts, a direct answer for CEM could not be reached towards subjects like civil engineering, the science behind which is clearly physics and basic science. No matter whether the answer for CEM is a cross section or combination of theories, a precise answer still could not reached, so the group tried to find the answers in the next stage from the published works.

**Question brought up:** Can we refer to the research we do or scope of journals that publishes our work?

To bring the question further, Prof. Makarand Hastak described that CEM could not be directly put into a category like physics or mathematics as in basic science. The science behind civil engineering is physics, and the answer is certain and direct, but not for CEM. Prof. Luh-Maan Chang argued that CEM is applied science, which needs transformation of all useful science/technology to CEM rather than competing with other scientists. Prof. Hans-Joachim Bargstäedt took building models for civil engineers as an example. Although it is straight forward when designing the structural models, in practice, engineers would not expect real buildings to behave exactly like them. Rather, they would behave according to their experience and limitations on site. The question
of the science behind CEM is still undetermined and would need more debates to resolve.

Some keywords (captured from manuscripts submitted to the ASCE Journal of Management in Engineering):

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<thead>
<tr>
<th>Decision Making</th>
<th>Employment</th>
<th>Marketing Strategy</th>
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<tr>
<td>Negotiation</td>
<td>Economic Models</td>
<td>Neural Networks</td>
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<td>Strategic</td>
<td>Risk Management</td>
<td>Cultural Issues</td>
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<td>Optimization</td>
<td>Organizational Issues</td>
<td>Labor Productivity</td>
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<td>Recovery Planning</td>
<td>International Development</td>
<td>Social Network Analysis</td>
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<td>Resource Allocation</td>
<td>Lean and Six Sigma</td>
<td>International Business</td>
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<td>Financial Problem</td>
<td>Information Technology</td>
<td>Simulation</td>
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<td>Dispute</td>
<td>Bio-energy</td>
<td>Environmental Issues</td>
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<td>Entrepreneur</td>
<td>Ecosystem</td>
<td>Renewable Energy</td>
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Question brought up: Should we raise the expectation or should we lower the expectation in CEM?

With his 10-year research and teaching experience of industrialization in China, Prof. Zhongfu Li presented the challenging question that current technological developments in China could not meet the rising needs of residential buildings. Standardization and prefabrication had again been brought up to meet Chinese needs.
Prof. Hans-Joachim Bargstäedt at the same time questioned how far people would stick to the current needs for the building environment. For example, BIM could enhance the quality and safety in the discussion of collaborative studies. However, society needs for buildings would not be simply just the basic functional needs. People were expressing growing demands for different lifestyles, not only for basic things like food but also for improved living conditions. To answer this question, meeting the needs for construction is meeting the new needs for new team-style and new technology. Searching solutions for technology and putting knowledge into education is therefore very necessary.

Finally, Prof. Jiayuan Wang put forward three fundamental questions especially for the Chinese CEM researchers, while appreciating the importance of the Chinese construction industry in the rapid urbanization process. The questions put forward are: (1) how to extract construction management theories, contribute to management knowledge, share with the global construction management field, enrich global construction management knowledge and improve management competency from the large scale construction projects in China; (2) how to renovate current urban buildings, construct new cities and protect the ecological environment so as to fulfill real sustainable construction; and (3) how the attitudes of different stakeholders are formed, measured, and how the attitudes affect the behavior in the process of decision-making. In order to address these fundamental questions, Prof. Jiayun Wang considered interdisciplinary research is necessary.

Conclusions
In concluding the discussion, and by thanking the members’ inputs, Prof. Dongping Fang combined the topic with his research on culture study about health & safety issues on construction site and the human behavior in his building information modeling collaboration study. Industry will definitely rely on more knowledge when facing the real projects. For the science behind CEM, either combined science, applied science, or a certain science could all lead to more debates in the future.
6.2 Session 2 Group Discussion

Subject:
What are the specific research issues/theme/problems/topics that should be addressed by the CEM community in the next decade?

Presenters
Prof. Charles T. Jahren (Moderator), Prof. Jan Wium, Prof. Thomas Ng, Prof. Luh-Maan Chang, Prof. Guangbin Wang

Group Discussion

Issues/theme/problems/topics be brought up
Prof. Charles T. Jahren from Iowa State University introduced the research program currently being followed in his university. Then with the group, a discussion towards modeling tools was put forward from the following points:

- Modeling and virtual design and construction
- Integrating smart cameras as a sensing technology
- Construction automation using 3D Modeling
- Immersive technology in the field
- Ties to asset management
- Integration with construction management and record keeping

Then, Prof. Jan Wium put forward critical themes in the next decade, which includes:

- BIM,
- construction risk management,
- time and cost overflow of large projects, and
- education practices

For BIM, the question is how to improve site quality during design, how to improve construction quality during design considerations, and how to realize remote monitoring and visualization are important. For construction risk management, finding methods to improve collaborative risk management practices needs further investigation. In respect of the time and cost overflow of large projects, a new approach is needed to manage large projects and solve the time and cost problems in constructing large projects. In education practices, the use of new technologies in practice and the use of new technologies in education should be emphasized. In responding to the questions raised by the participants, Prof. Jan Wium considered opening minds to
collaboration, using technologies facilitating sharing is necessary to teach collaboration in education programs.

Prof. Thomas Ng took his turn by adopting a critical viewpoint that the current research issues about increasing urbanization, existing stock of construction facilities and challenging environmental problems have been done enough. The challenges going forward, which Prof. Hans-Joachim Bargstäedt also brought in the group 1, can be shown in the following:

- Health and safety
- Demand for higher productivity
- Imbalance resource distribution, and
- Changing political and social requirements

**Question brought up:** Where is the way forward?

To bring this question further, Prof. Thomas Ng pinpointed that the major issue for Hong Kong is the shortage for land, so the sustainability and green materials such as green concrete should be examined to reduce the carbon emission. Issues related to the zero carbon buildings such as the carbon reduction in real life projects and how they can satisfy the users’ needs in operation are under researched. Green refurbishment was noted as a research trend for retrofitting existing buildings that is increasing. The BIM collaboration platform using the carbon footprint would be worth researching and so would studies that:

- **Strengthen our identity in sustainability in CEM**
- **Formulate a roadmap for sustainability in CEM research**
- **Form a consortium involving different universities to promote sustainability in CEM**
- **Conduct collaborative and preferably multi-disciplinary research in this theme**

Followed the discussion above, Prof. Luh-Maan Chang from the National Taiwan University shared his experience on high-tech facility construction uses of nanotechnology. He put forward FIM (Fab-Information Modeling) and interdisciplinary studies of nanotechnology and CEM as the trend for building a smarter future.

The session continued by Prof. Guangbin Wang who shared his thoughts on ‘measurable and integrated construction’, mainly from the technical point of view. The Model Based Definition (MBD) he borrowed from the Case of Boeing 787 had a similar time towards the development of BIM. And he also made the point that a BIM-centric solution is ‘Radical Innovation’ as quoted ‘not only a technology change
but also a process change’. For the research issues/theme/problems/topics should be addressed by the CEM community in the next decade, he proposed the following:

- **Further explore potential areas for the integrated implementation of different BIM-centric modeling, sensing and analysis technologies, and improve the interoperability among the implemented technologies/systems;**
- **Further identify the driving mechanism and related to technology/industry/enterprise/project/individual (TIEPI) factors for the adoption and assimilation of BIM-centric technologies in construction projects;**
- **Further explore how to implement corresponding organizational and process changes (especially the change of project delivery systems) to complement the technological adoption of BIM-centric solutions in construction projects.**
- **Further use BIM-centric innovation technology for Sustainable Development of AEC industry.**

Prof. Guiwen Liu put forward that for the challenges in BIM mainly lie in organization and process change rather than the technology.

**Conclusions**

Prof. Charles T. Jahren summarized that the challenges for CEM on technology (different demand on BIM, electronic equipment in pocket), education (online education without traveling dangerously, and qualification for engineers like in the US for Bachelor degree+ 30 credits), sustainability (reflection of the discussion in green building and other areas), asset management (compared to 1970s hunger for management programs for CEM in the US, nowadays another circle) will lead to further discussion on the subject in the future. However, he personally thought that the ideas shared by Prof. Guangbin Wang and Prof. Luh-Maan Chang had brought the question too far from the subject.
6.3 Session 3 Group Discussion

Subject:
How should we encourage and support multi-disciplinary research collaborations to address key issues faced by our CEM community?

Group Participants
Prof. Lucio Soibelman (Moderator), Prof. Guiwen Liu, Prof. Geoffrey Q. P. Shen, Prof. Saixing Zeng, Dr. Sebastian MacMillan

Group Discussion
Prof. Guiwen Liu from Chongqing University started his presentation arguing that the real life projects demanded people from different disciplines to collaborate. Three essential key words for leadership are systematic, integrative and collaborative. Prof. Liu enlightened the room by provoking the question on how to provide for the students to practice their leadership skills, as he can see the importance of leadership in the future when they venture into industry, as well as in conducting research.

Different stakeholders with different expertise are involved in the projects that need them to work together. Prof. Geoffrey Q.P. Shen used the old Chinese saying ‘heaven, earth and people’ as three critical elements in collaborative working while introducing the multi-disciplinary research collaboration in a workshop in 2007. ‘Heaven’ described the external factors about right timing and international awareness. A suitable environment and collaborative research funding schemes, which encouraged people to collaborate, are methods and good opportunities for the ‘earth’ of collaborative working. To let different disciplined people work together reaching the same goal, their desire and commitment would be seen as the ‘people’ element in collaborative working.

Dr. Sebastian MacMillan started his presentation by positive thinking on the 2012 London Olympics as the best time for construction in the UK. He thought it not necessary to clearly specify the science or theory towards CEM. He used a metaphor on ship building to describe the project chemistry on collaborative working. Industry recognition for collaborative working is also seen as one of the elements. A coordinated program of intense international research and international funding bodies are also necessary.
Conclusions

Prof. Lucio Soibelman in his concluding remarks for session three argued that multi-disciplinary researchers faced the same fundamental question whether the researchers are ‘students of problems’ or ‘students of solutions’. In order to set the right questions under specific conditions instead of being the experts on every subject, he suggested the CEM community consider the following variations:

- Conversation/communication – Physical co-location
- Talented leadership
- Appropriate reward and incentive mechanisms (including career and financial rewards)
- Adequate time
- Seed funding for initial exploration
- Willingness to support risky research
- Interdisciplinary research by definition requires the researchers to learn the other discipline.

Letting people solve the right questions would have a huge pay back on collaborative working, so the discussion ended with how to choose multidisciplinary or interdisciplinary research topics from common to interaction. The participants in this group reached an agreement inadvertently that the collaborative working needs the leadership, adequate time and collaborative research funding schemes. When the internal and external conditions are suitable for the right people, reaching ‘heaven, earth and people’, the multi-discipline collaborative working would work.
7.0 SUMMARY AND WAY FORWARD

This forum reached three major academic questions in CEM, looking into the future research trends in the next decade and supporting multi-discipline research collaborations. Although the discussion did not reach a certain conclusion in the first group discussion towards CEM basis, the fundamental/ science questions to be answered by CEM community were brought out much clearer as the discussion proceeded.

Future trends in the next decade would not only be developed in the technology field like BIM, but also the collaboration towards multi-discipline research topics (mainly discussed in the second group). Education and qualification for professionals in the CEM community, asset management and sustainability in buildings would be the major trends of the research in the next decade.

After the presentations of collaborative working in the CEM community, setting the right people on the right topic at the right time could be considered as the inadvertent agreement from all the members. The groups discussed the structure of facilitated collaboration. This would lead to further collaboration within the CEM community and make more contribution by setting adequate resources all around the world.

The participating members represent the CEM experts from 17 universities located in USA, UK, EU, China, Taiwan and South Africa. Their valuable contributions and sharing of experiences in both academic and industry made a significant contribution to this forum. Participation of other delegates also contributed via several questions addressed during the group discussion sessions. The further reflection over this forum would also help the researchers find the niche areas and pursue their research works within the CEM field.
8.0 EVENT’S PHOTOS

THE 2013 GLOBAL LEADERSHIP FORUM FOR CONSTRUCTION ENGINEERING AND MANAGEMENT PROGRAMS

Group photos of the participating members

THE 2013 GLOBAL LEADERSHIP FORUM FOR CONSTRUCTION ENGINEERING AND MANAGEMENT PROGRAMS

Group photos of the delegates
Group photos of the participating members during the reception dinner

Welcoming speech by the organizing chairman during the reception dinner
The introduction of new members’ session

Opening speech by Prof. Jin-guang Teng of The Hong Kong Polytechnic University
9.0 UPCOMING GLF-CEM

The Executive Committee meeting had a preliminary decision that The 2014 GLF-CEM will be held in University of Alberta, Canada under the leadership of Professor Simaan M. AbouRizk on 6th and 7th June 2014. More details about this would be shared with members early in 2014.

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