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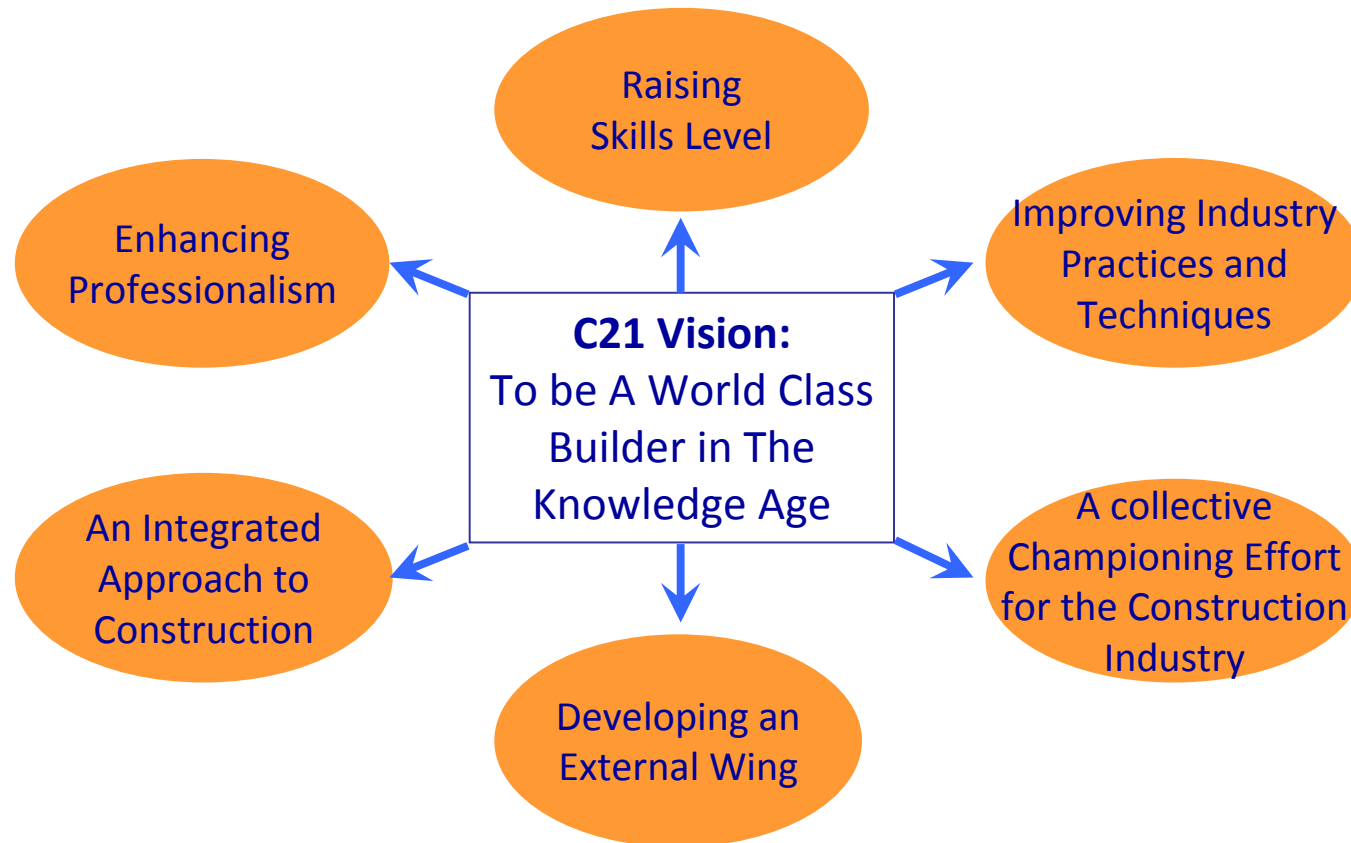
A decade of change and improvement in Singapore construction industry: Review of Construction 21



Professor George Ofori
Dr Evelyn Teo
Dr Imelda Tjandra

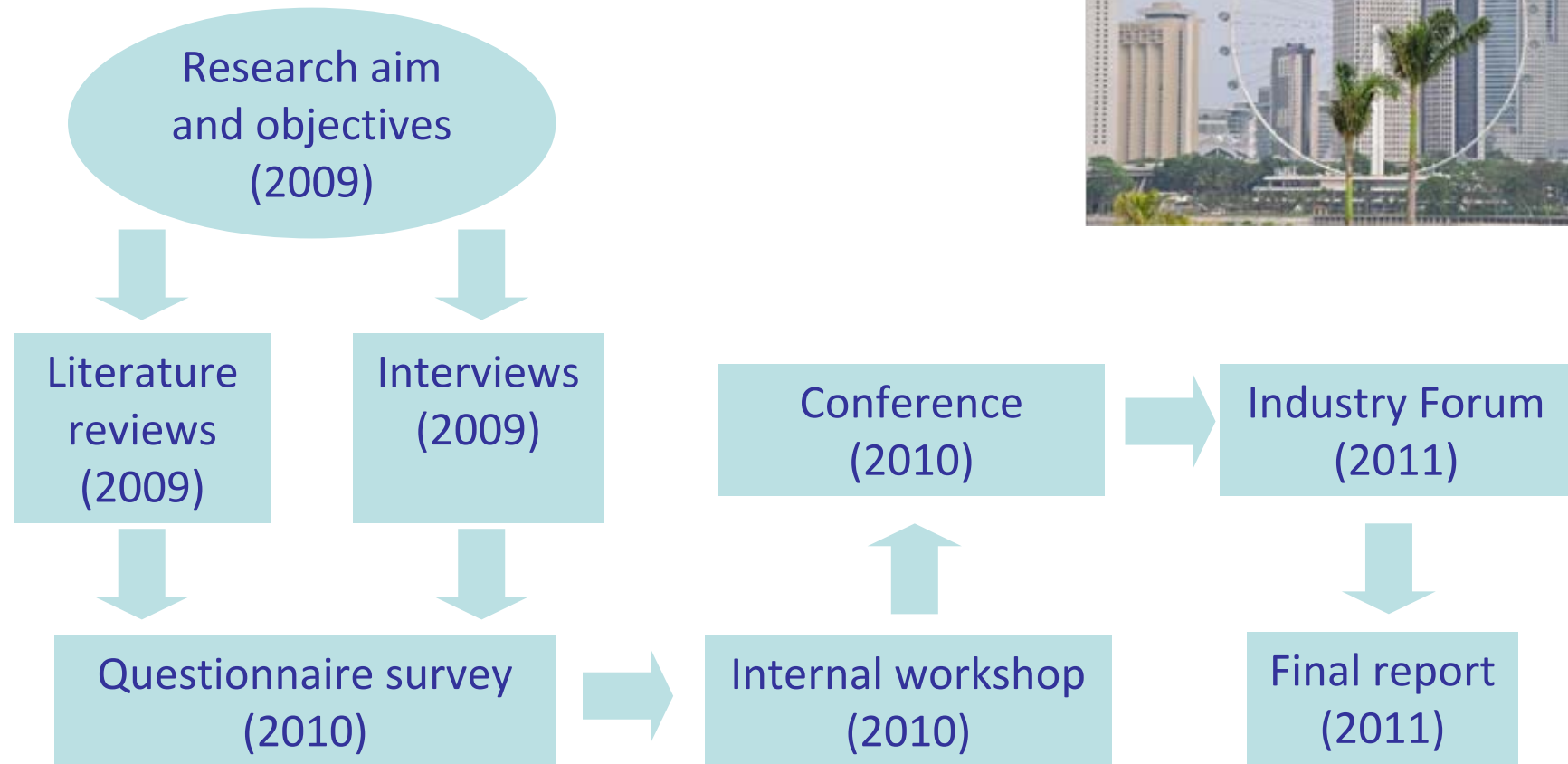
Construction 21 Report

- C21 gave 39 recommendations, 6 strategic thrusts, 2000-2010.



- Radical transformation to turn industry from one which is “dirty, dangerous, demanding” (3D) to “professional, productive, progressive” (3P).

Research Process



Literature Review

- International Studies
 - Australia
 - Hong Kong
 - Malaysia
 - Netherlands
 - Singapore
 - South Africa
 - Sweden
 - United Kingdom
- Construction Industry in Singapore
 - Demand Stability
 - Government Management of the Construction Industry
 - Subcontracting
 - Performance Measurement
 - Sustainability
- Performance Improvement Initiatives in Singapore
 - Enhancing the Professionalism of the Industry
 - Raising the Skills Level
 - Improving Industry Practices and Techniques
 - An Integrated Approach to Construction
 - Developing an External Wing

Empirical Study

Interviews

- September to November 2009
- Nine in-depth, face-to-face semi-structured interviews with 12 key people from the public and private sectors.

INTERVIEWEE	POSITION	ORGANISATION TYPE
1A 1B	Director Deputy Director	Government
2	Executive Director	Consultancy firm
3	President	Professional body
4A 4B 4C	President and Chief Executive Officer (CEO) Executive Vice President Executive Vice President	Consultancy firm
5	Chairman	Consultancy firm
6	Past President	Professional body
7	General Manager	Developer
8	Executive Director	Trade association
9	Deputy Director	Government

Empirical Study

Questionnaire Survey

- Hardcopy
- Online <https://esurvey.nus.edu.sg/efm/se.ashx?s=1CC7023E2FE5794E>
- March 2010

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Department of Building, NUS

Section B: C21 Recommendations

In this section, we need your opinion concerning the effectiveness of the implementation of C21 recommendations, specifically during the period from 1999 to 2009.

3.

Very familiar Familiar Neutral Not familiar Not familiar at all
☐ ☐ ☐ ☐ ☐

To what extent are you familiar with the C21 report?

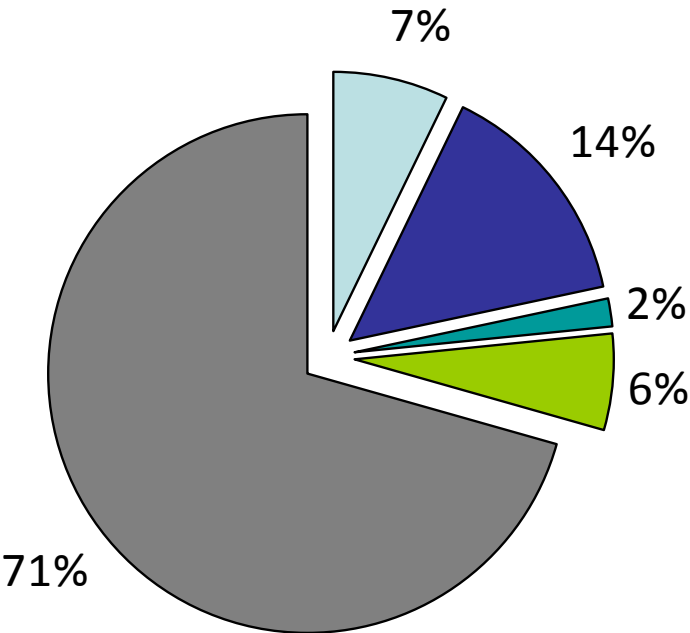
4. To what extent do you believe the following measures have improved the professionalism of the construction industry?

	Rating				
	Very effective	Effective	Neutral	Not effective	Not effective at all
4.1 Various courses offered by the educational institutions, professional bodies, and BCA Academy, designed to meet the needs of the industry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.2 The mandatory requirement of the Continuing Professional Development (CPD) programmes for the renewal of professional and trade membership.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.3 Industry awards to promote and recognise achievements such as quality of work, productivity, innovation, and green performance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.4 The increase in use of IT in general.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.5 The increase in use of CORENET programmes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.6 Progressive strengthening of Contractors Registration System.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.7 The licensing of all contractors (including sub-contractors).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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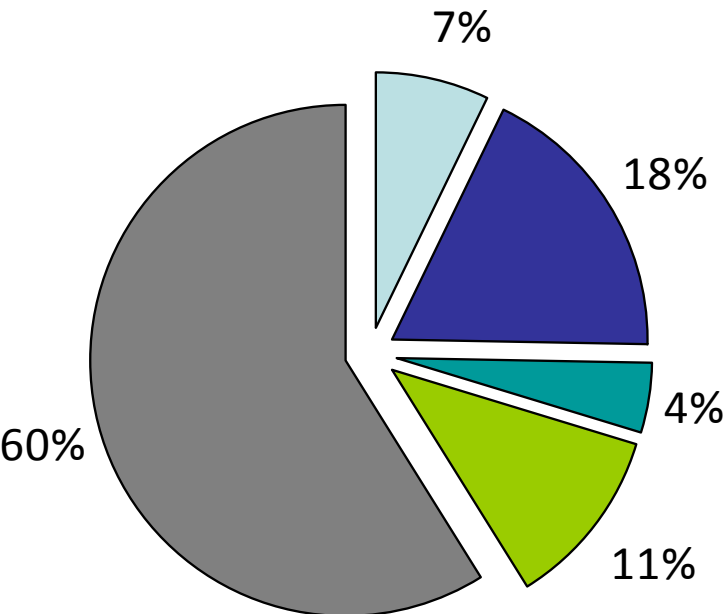
Empirical Study

Questionnaire Survey



- Clients
- Architectural firms
- Quantity surveying firms
- Engineering firms
- Main contractors

Sent out: 2,369



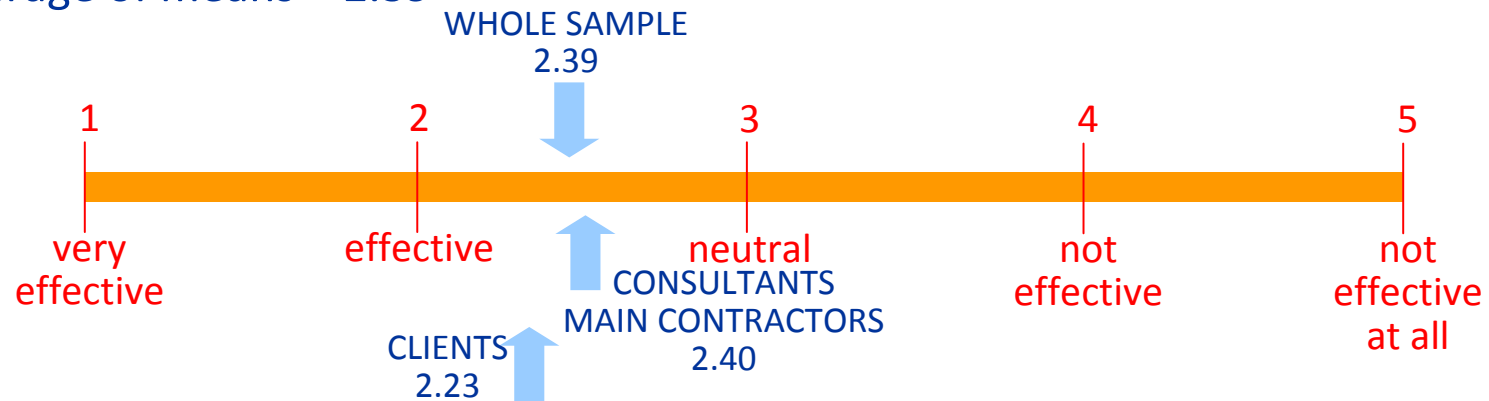
- Clients
- Architectural firms
- Quantity surveying firms
- Engineering firms
- Main contractors

Usable responses: 257 (11.03%)

Summary of Survey Results

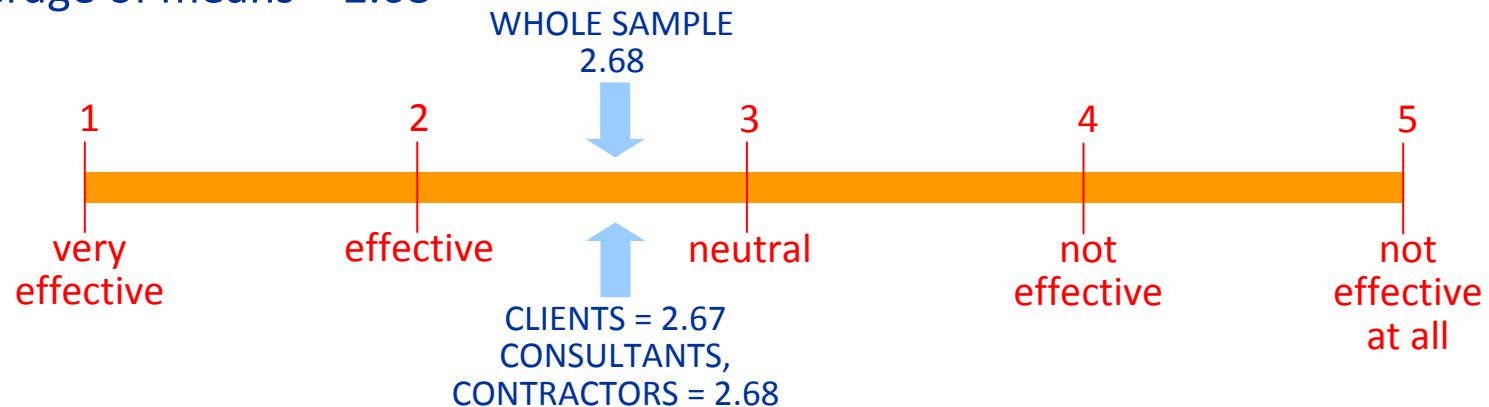
- Strategic thrust 1: Enhancing the professionalism of the industry

Average of means = 2.39



- Strategic thrust 2: Raising the skills level

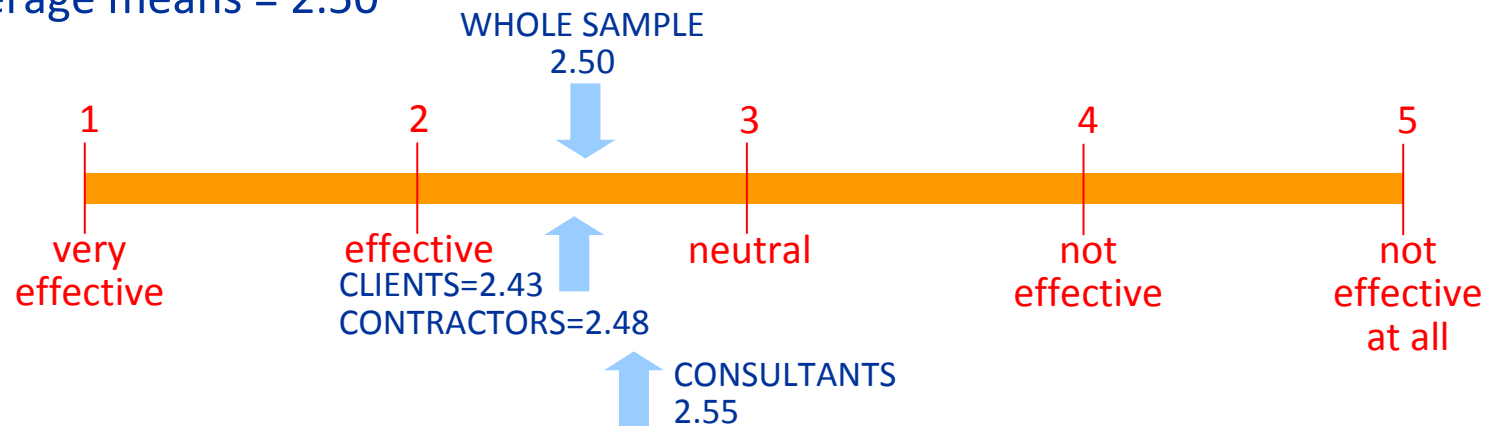
Average of means = 2.68



Summary of Survey Results

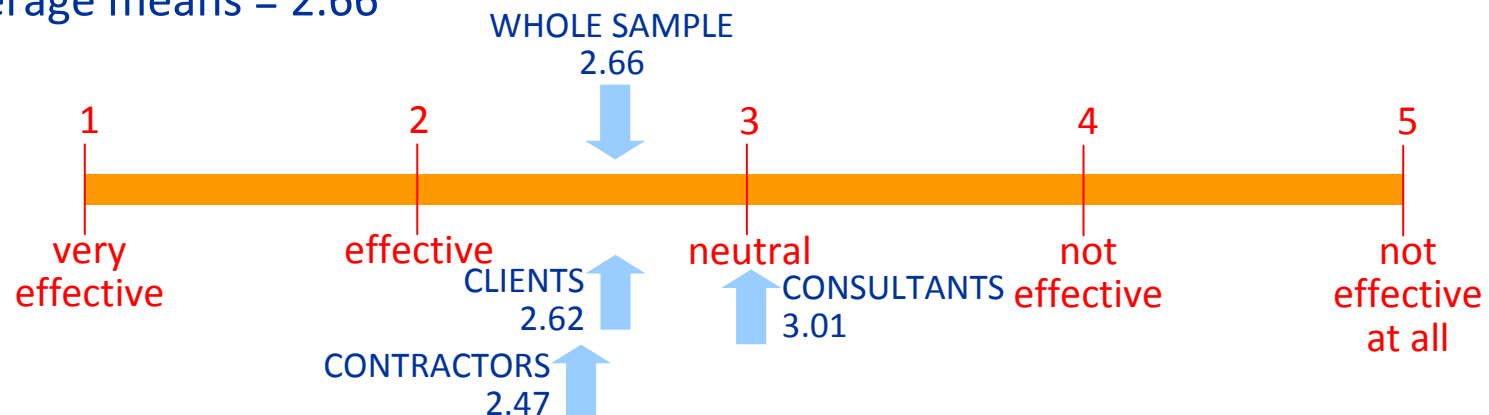
- Strategic thrust 3: Improving industry practices and techniques

Average means = 2.50



- Strategic thrust 4: An integrated approach to construction

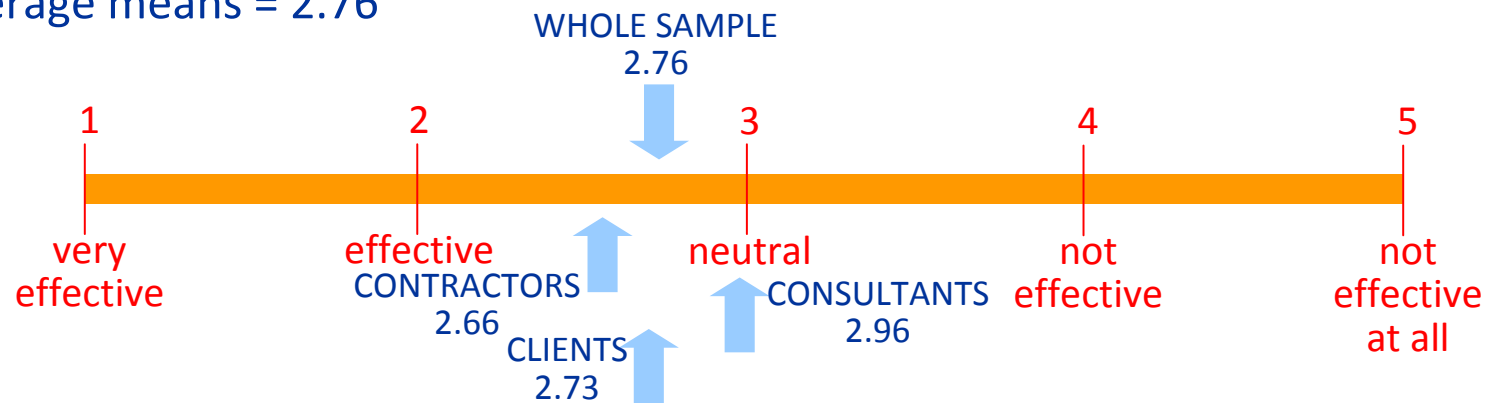
Average means = 2.66



Summary of Survey Results

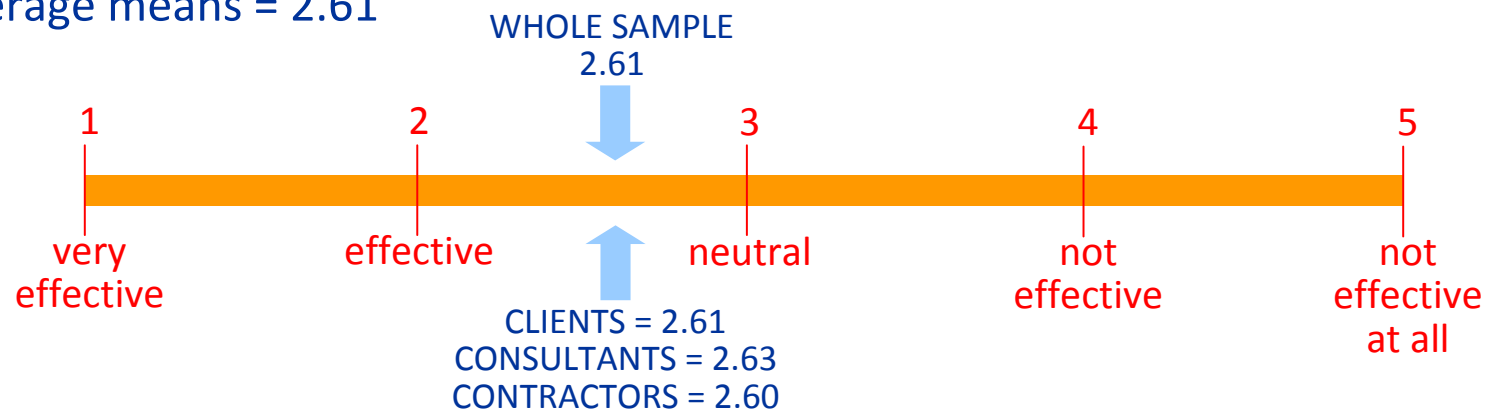
- Strategic thrust 5: Developing an external wing

Average means = 2.76



- Strategic thrust 6: A collective championing effort

Average means = 2.61



Conference

- 3 June 2010
- 7 speakers
- 2 panel discussions
- 87 participants



Department of Building
Centre for Project Management & Construction Law
National University of Singapore



Conference on the Future of Construction Industry in Singapore

The construction industry in Singapore has undergone transformation in the past ten years. The Construction 21 Report, which was launched in 1999, had been a blueprint for developing the construction industry in Singapore. The conference will review the achievements from, and the challenges encountered in, the implementation of the report, and consider the next steps to be taken in the development of the industry.

Distinguished speakers and experts from the main stakeholders in the construction industry will share their insights on the future of the industry in Singapore from their perspectives in individual presentations and a panel discussion. Researchers from the National University of Singapore will share their findings. The researchers from the University of Hong Kong and University of Reading will also present the main findings from the industry improvement initiatives in Hong Kong and the UK.

Programme

09.00-09.30	Registration
09.30-09.45	Opening address
09.45-10.15	Professor George Ofori <i>A Decade of Change and Improvement? Construction Industry Development Programmes in Singapore</i>
10.15-10.30	Coffee Break
10.30-12.00	Presentations by Leaders of Professional Institutions and Trade Associations <ul style="list-style-type: none"> • Mr Seah Choo Meng (President, Society of Project Managers) • Mr Ashvinkumar s/o Kantilal (President, Singapore Institute of Architects) • A representative of the Singapore Contractors Association Limited
12.00-13.00	Panel Discussion, chaired by Dr Tso Ho Pin (MP and Mayor of North-West District) <ul style="list-style-type: none"> • Mr Lam Siow Wah (Deputy CEO, Building & Construction Authority) • Mr Seah Choo Meng • Mr Ashvinkumar s/o Kantilal • A representative of the Singapore Contractors Association Limited
13.00-14.00	Lunch
14.00-16.00	<ul style="list-style-type: none"> • Professor Stuart Groom <i>Construction Industry Reform in the UK</i> • Dr Gangadhar Mahesh <i>Evaluating Construction Industry Development in Hong Kong</i> • Dr Evelyn Tso <i>Synthesis and Comparison of Singapore, UK and Hong Kong Experiences</i> • Q&A
16.00-16.15	Closing Remarks
16.15-17.00	Coffee Break
	End of Conference

Details

Date: 3 June 2010
Time: 9am - 5pm
Venue: Copthorne Orchard Hotel
214 Dunearn Road
Singapore 299526
Fee: \$130
(inclusive of GST)

Objectives

- To consider the findings of a review of the Construction 21 report, which was published in 1999, and in which many initiatives were proposed for improving the performance of the construction industry in Singapore
- To compare the findings in Singapore with those from similar reviews in Hong Kong and the UK, and to draw mutually beneficial lessons
- To discuss the views of the key stakeholders on the future of the industry in Singapore

Benefits

The practitioners who attend this conference will learn about the results and impact of the measures in the Construction 21 Report to:

- enhance professionalism in the industry
- integrate the construction process (including design and build)
- enhance productivity (such as promoting more buildable designs), quality and safety (including the use of information technology).

They will also find out how some of the main stakeholders of the construction industry perceive the future.

Who should attend

- Contractors
- Project Managers
- Architects
- Engineers
- Quantity Surveyors
- Public administration
- Clients
- Academics teaching or researching the area of construction management

CPD Accreditation

PEB - 7 points
SIA - 6 points
SISV - 5 points

Industry Forum

- 22 February 2011
- 18 Industry Leaders
- 5 academics
- 3 groups
- Plenary session

Department of Building
Centre for Project Management & Construction Law
National University of Singapore
Forum of Construction Industry Leaders in Singapore



INTRODUCTION

The construction industry in Singapore has evolved since the publication of the Construction 21 (C21) report in 1999. The adoption of a range of progressive practices in Singapore has been encouraged by C21. The report has been a blueprint for developing the construction industry in Singapore. An industry-wide survey conducted in March 2010 found that C21 had been effective in addressing many of the problems of the construction industry. However, it is evident that more needs to be done to improve the effectiveness of each initiative. The Industry Forum will review the achievements from, and the challenges encountered in, the implementation of the report, and consider the next steps to be taken in the development of the construction industry in Singapore in future.

OBJECTIVES

The objectives of the Forum are:

1. to discuss how C21 has impacted on the way construction firms and practitioners work; and
2. to discuss the way forward for the construction industry in Singapore.

BENEFITS

The Forum will be a platform for the Industry Leaders to share the impact of the measures in the C21 report to enhance professionalism, raise the skills level, and improve industry practices and techniques. They will also discuss how the industry can move forward in addressing its challenges, enhancing its performance and adding value to its services and output.

DETAILS

Date : 22 February 2011
Time : 08.30-13.40
Venue : SDE Staff Lounge (SDE3 Level 2)
School of Design and Environment
National University of Singapore
4 Architecture Drive, Singapore 117566
Admission by invitation only



PROGRAMME

08.30-09.00 Registration
09.00-09.20 Opening address
09.20-11.20 Breakout groups
Group 1: Enhancing the professionalism of the industry
Group 2: Raising the skills level
Group 3: Improving industry practices and techniques
Group 4: Looking ahead: future issues to consider
11.20-12.30 Individual group presentations
12.30-12.40 Closing remarks
12.40-13.40 Lunch
End of forum



Progress Since C21

- Range of progressive practices encouraged by C21.
 - CORENET: most successful; one factor that led Singapore to be ranked first in the world in ease of doing business (International Finance Corporation, The World Bank Group, 2010).
 - CONQUAS.
 - Buildability.
 - Continuing Professional Development (CPD) programme.
- However, some recommendations have not been implemented.
 - Codes of conduct: drafted, but it was so general that it was not necessary anymore.
 - Construction (Design and Management) Regulations: In progress.



Progress Since C21

- Some C21 initiatives and programmes have not succeeded.
 - Intention to reduce the number of foreign workers.
 - Man-Year Entitlements (MYE): It has been tightened and restored, some unexpected practices have developed; limit might not be tight enough.
 - Maintainability study: It has been launched, yet not been much used in industry.
 - National Productivity and Quality Specifications (NPQS): Launched, yet has not been pervasively used.
 - Construction Management System: A web-based application was completed in 2004, but it did not take off in industry.
 - Standardisation of contracts: No common contract yet.
 - Multidisciplinary firms.



Progress Since C21

- Dirty, Demanding, Dangerous (3Ds) → Professional, Productive, Progressive (3Ps).
 - Much progress, but degree of progression was not as much as it should have been.
- Issue of foreign workers is main concern for many people in industry.
- Impact of C21 on the way the firms work:
 - Construction projects have become more complex.
 - More time is required for projects, from inception to completion.
 - Construction projects have become more expensive to complete.
 - There is greater risk involved in construction projects.

but...

 - Firms can better manage construction projects.
 - The quality of building has improved.



Current Issues

Sustainability

- Green Mark for Buildings Scheme – January 2005.
 - Platinum, Gold Plus, Gold, Certified.
 - Benchmarking of a building's environmental performance.
 - Basis for further research and the development of a design guide for green buildings.
 - As of June 2010: 350 buildings have made the Mark.
- 1st and 2nd Green Building Masterplans.
- Research focus in green building technologies.
- Awards to encourage the adoption of green initiatives.
 - Green Mark Award – 2005
 - Green Mark Champion Award – 2008
 - Green and Gracious Builders Award – 2009



Current Issues

Sustainability



Cube 8

Image from <http://www.bca.gov.sg>



Zero-Energy Building @BCA Academy

Image from <http://www.mnd.gov.sg>

GREEN MARK PLATINUM AWARD WINNERS 2010



Sky Terrace @Dawson

Image from <http://www.bca.gov.sg>

Current Issues

Productivity

- S\$250 million Construction Productivity and Capability Fund (CPCF).
 - Part of national drive to raise productivity and foster a productive workforce and workplaces.
 - Initiatives to help local contractors develop capabilities in areas such as complex civil engineering and building projects, to invest in new technologies, and upgrade to a higher quality workforce.



Current Issues

Productivity

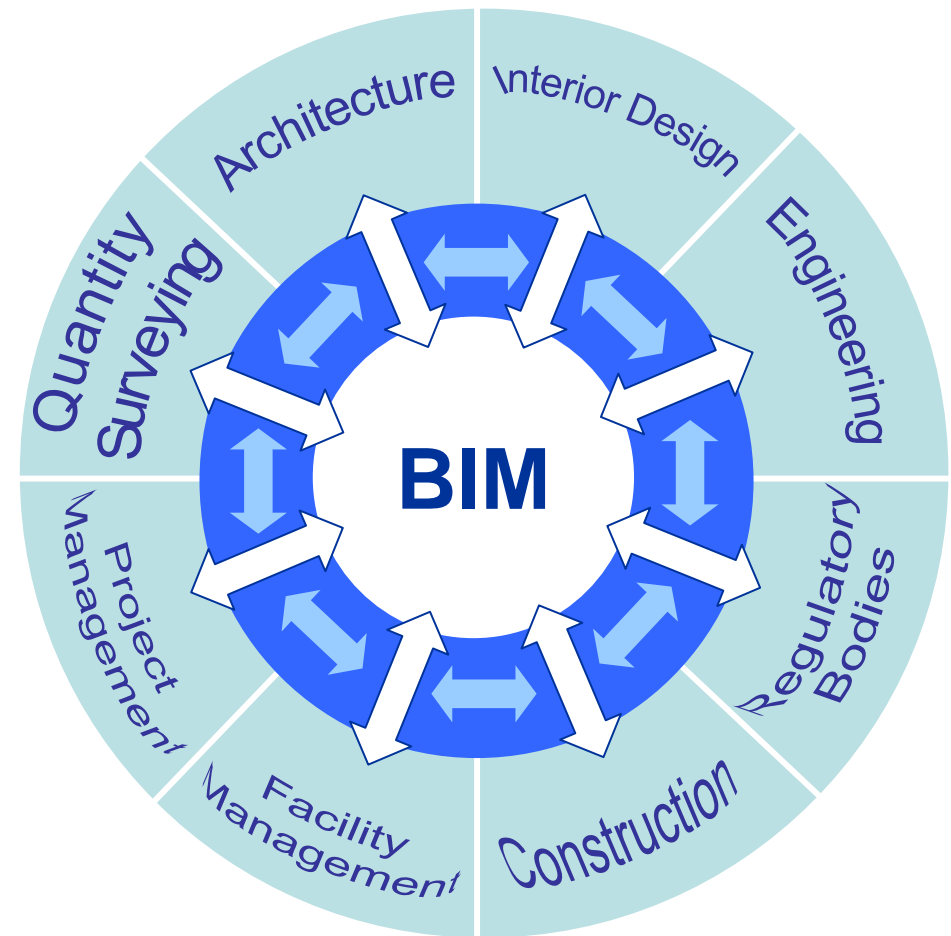


Source: <http://www.bca.gov.sg>

Current Issues

Building Information Model (BIM)

- A platform to facilitate integration of knowledge in design and construction, and handing over to facilities management.
- Tools to help designers and contractors anticipate design problems during early stages of a project, minimising unnecessary work during construction phase.



Current Issues

Safety

- Towards zero injury in construction sector:
 - Occupational Safety and Health (OSH) Framework – 10 March 2005.
 - Workplace Safety and Health Act (WSHA) – 1 March 2006.
 - Workplace Safety and Health Council (WSH Council) – 1 April 2008.
 - “Implementing WSH 2015 for Construction Industry” – 2007.
 - “Implementing WSH 2018 for Construction Sector in Singapore” – April 2010.



Current Issues

Safety

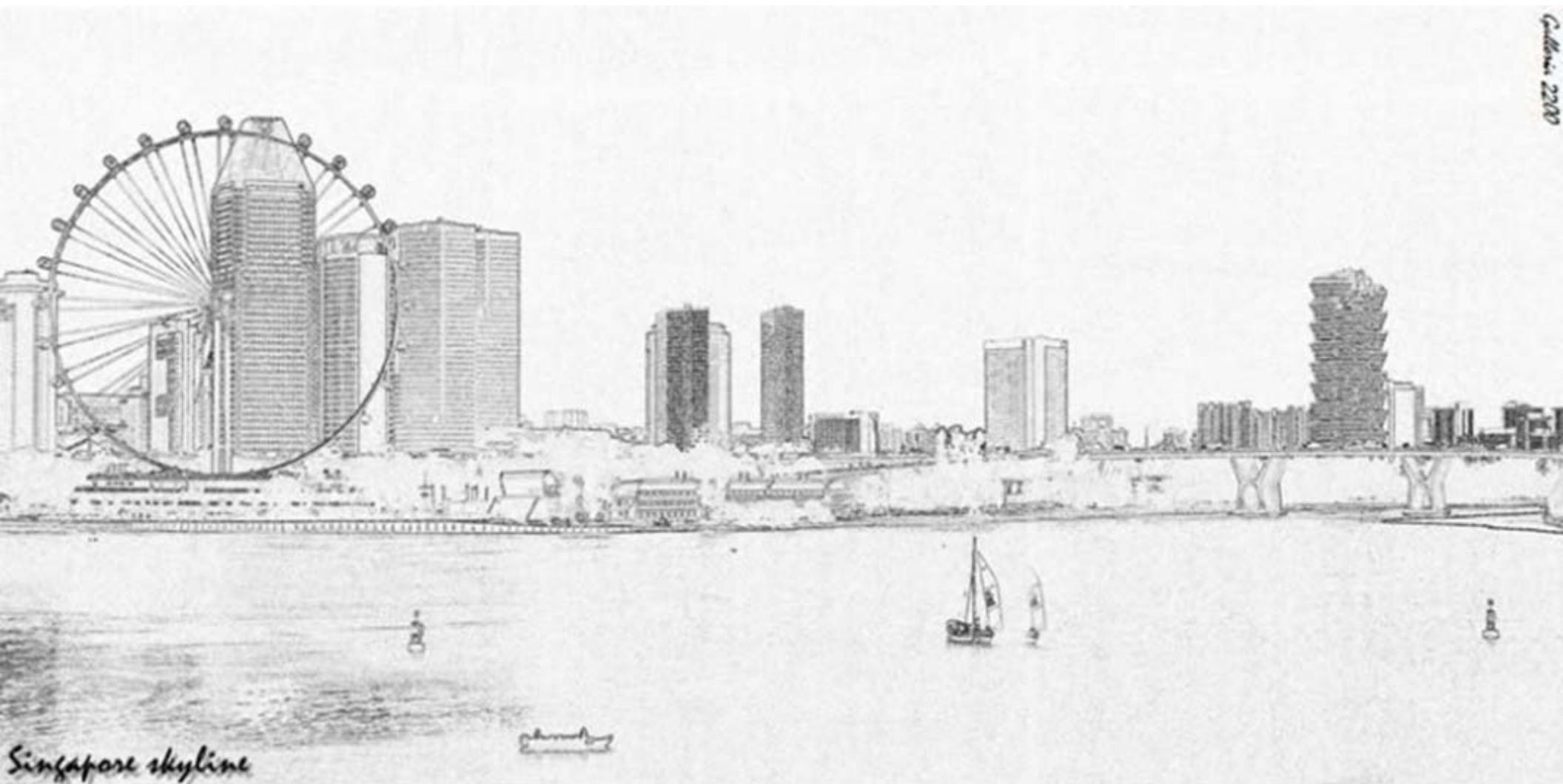
- Specific action plans to improve WSH standards in the construction sector:
 - Building strong capabilities to better manage WSH.
 - Individual, corporate, and industry levels.
 - Developing a performance-based regime.
 - Include designers and developers in the regulatory framework, setting industry standards.
 - Promoting the benefits of WSH and integrating WSH into business.
 - Driving improvements through large organisations, assessments of safety and health management systems.
 - Creating and building partnerships.
 - Co-ordination of work, industry-led taskforces.



Conclusions

- Singapore has made much progress in developing its construction industry.
- The government has always paid an active attention to the construction industry.
- C21 had been effective in addressing some of the problems of the construction industry.
- However, C21 has not achieved the intended radical transformation of the industry.





thank you.