THE ROLE OF KNOWLEDGE MANAGEMENT IN ENHANCING KNOWLEDGE PULL IN THE CONSTRUCTION ORGANISATION TO DELIVER INNOVATION: A CASE STUDY

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1,2Tayyab Maqsood, Derek H. T. Walker3 and Andrew D. Finegan4

1Doctoral Candidate Cooperative Research Centre for Construction Innovation, RMIT University, Melbourne, Australia
2School of Business Information Technology, RMIT University, Melbourne, Australia
3Professor of Project Management, Graduate School of Business, RMIT University, Melbourne, Australia
4Senior Lecturer, School of Information Technology, Charles Darwin University, Darwin, Australia
Background of Research

Cooperative Research Centre (CRC) in Construction Innovation:

Project 2001-004 (2B)—Delivering Improved Knowledge Management and Innovation Diffusion

Project Leader: Professor Derek H. T. Walker

PhD Research:

An investigation into the role of knowledge management in supporting innovation for effective planning and delivery of construction projects (In Progress)
Construction Process

Various organizations contribute their specialties in the form of people, process and technology

Designers, Architects, Estimators, Planners, Project Managers, Labourers, Foremen, etc

Designing, Estimating, Planning, Project Management, Method statements

Assisting technologies, Computer technology, Robotics, Automation, Construction technologies

Consumers

Suppliers

Supply

Information

RAW MATERIAL

TRANFORMATION

CONSUMPTION

Basic thing, in action, behind the above transformation is ‘knowledge’
Knowledge and Knowledge Management

- Tacit knowledge of individuals
  - unarticulated and intuitive
  - Intellectual Capital, hidden and Intangible
  - Well Spring of Innovation
- Explicit knowledge
  - Procedural
  - Codified and easily transmitted
  - Made part of the machines (computers/robotics)

Knowledge management is about the processes by which knowledge is created, stored, captured, shared, transferred, implemented, exploited and measured to meet the needs of an organization

Knowledge Management is, therefore, being recognised as a vehicle through which innovation and improved business performance is possible
Shift in Focus of Knowledge Management Research

- Understanding cultural aspects and soft issues
- Considering technology only as an enabler (90% human 10% technology)
- Recognizing that knowledge is esoteric and contextual
- Developing communities of practice and social networks
Knowledge Management or Managing for knowledge cause organisational learning and transforms organisations into learning organizations.

Learning organizations produce innovative output.
Soft systems thinking is concerned with defining the options for improvement, in addressing the **what to do** question.

*It is essentially committed to the examination of human activity.*
The Soft Systems Methodology, using systems thinking and systems concepts, provides a process and a structure for incremental improvements to such situations which involves all the stakeholders in a continual learning cycle.

(Barry and Fourie McIntosh, 2001)
Soft systems thinking seeks to explore the messy problematic situations that arise in human activity. However, rather than reducing the complexity of the “mess” so that it can be modelled mathematically (hard systems), soft systems strive to learn from the different perceptions that exist in the minds of the different people involved in the situation.

(Andrews, 2000)
1. The problem situation in its unstructured form

2. The problem situation expressed as a rich picture

3. Root definitions of relevant, purposeful activity systems.

4. Conceptual models of the systems named in the root definition

5. Comparison of models (4.) with the real world (1. & 2.)

6. Identification of the feasible, desirable changes

7. Action to improve the problem situation.

Real World – the “wicked problem”.

Systems Thinking about the Real World

Adapted from Checkland, 1999: 163
Applying SSM to Problems in Construction Project Management

Using SSM:

- to facilitate effective change and to improve work practice (Elliman and Orange, 2000)
- in the early stages of a project to assist stakeholders to achieve a common understanding of the problem situation (Green, 1999)
- rich pictures and root definitions to identify responsible actors, key transformations, and the knowledge resources that are appropriate to the needs of a construction company (Cushman et al., 2002)
- for Knowledge Elicitation (Walker et al., 2003)
- in Project Definition (Neale, 1995)
Case Study
European Conference
Sources of Innovation

Delegates

We are losing big $s on this project. It is a DEAD DUCK!

Customer

Building Project

If we use BAMTEC we can save this project.

SUCCESS!

Potential linkage

KM Consultant

Knowledge management will help establish value.

Design Engineers

Conference Attendance
Pull ideas into industry

I’m far too busy to attend conferences.

Conferences are one form of professional development. They allow us to deliver value by learning new technologies and techniques.

Push ideas into industry
More Details

Push ideas into industry

Australian BAMTEC Agent

Where or what is the value?

Senior Management

We do not have the money to send you to international conferences.

Competition

Design Engineer

I am far too busy to attend conferences.

Senior Management

I am far too busy to attend conferences.
A system owned by the Design Engineers, who with the support of Senior Management are able to achieve professional development and learn new ideas and techniques by attending major, international conferences. This adoption of innovative building techniques can be the key to project success. However, Senior Management need to be convinced of the value of conference attendance, and many design engineers consider themselves to be too busy to attend conferences.
**CATWOE**

**Customer:** The building company, project managers, the clients and the community.

**Actors:** Design engineer, senior management.

**Transformation:** To achieve professional development and learn new ideas and techniques by attending major, international conferences.

**Weltanschauung (why Bother?):** This adoption of innovative building techniques can be the key to project success.

**Owner:** Design engineer

**Environment:** Work pressure, cost and time critical, and community expectations.
Set the criteria needed to define what will be the important ideas and techniques to learn

Know the client’s technical requirements

Know which conferences are worth attending

Involve Senior Management in the process

Know the opportunities for applying innovations to projects

Adopt Innovation and diffuse it

Monitor and Control the adoption of innovation

Deliver innovative solutions

Organisational Benefit
For each activity in the model, the following questions are to be asked?

- Do you undertake the described activity?
- How is this activity accomplished?
- Define your measure of performance for undertaking this activity.
- Describe any improvements that could be made to the way this activity is undertaken.
- How are you likely to undertake this activity in the future?
- Do you think this is an important activity?
Set of Actions

1. Involve senior management and make them aware of the benefits that external knowledge may bring

2. Developing a framework to decide what are important ideas and techniques to learn

3. Spot the conferences or other external events

4. Asking project manager to report on innovation opportunities that he may be able to pinpoint while executing a certain project.

5. Devise selection criteria as a matter of rewarding the employees and selecting and sending them to attend conferences.

6. Arrange a seminar or socialising event where an employee returned from a conference with certain knowledge would be able to share and transfer it to other employees in the organization.
Concluding Remarks

- Knowledge pull is important for delivering innovation

- Knowledge Management can serve as an interface with external knowledge sources

- SSM incorporates all the participants in a continual cycle of learning and incremental improvement

- SSM maybe referred to as one of the KM tools in order to gain integration between people, process and technology resulting in organisational transformation into a learning organisation