ICT IN CONSTRUCTION:
A Need for Change

Achim Weippert

Today's Industry

Today's construction industry is at a critical point in its history… with many 'divides' being created… moving it in new directions:

From:

- paper ► **electronic media** (paperless office)
- local ► **global commerce** (globalisation)
- followers ► **industry leaders**
- reactive ► **proactive industry** (R&D by industry – for industry)

(Russell J.S. 2000)

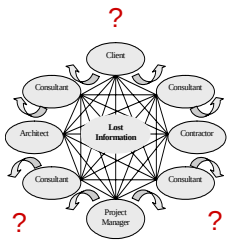
The Australian construction industry, through:

- the **end products** it creates,
- its size and ability to create **employment**…

Has the potential (more than any other service industry) to influence Australia's GDP

(Love P.E.D., Tucker S.N. et al. 1996)

Today's Industry Challenges



"The implementation & application of innovative information & communication technology (ICT) solutions are seen by many as a potential solution."

- **Poor** communication & information transfer
  - **Inadequate** coordination
    - **Insufficient** project team integration

Due to:

- **Dispersed** nature of the industry
  - Data exchange largely undertaken on **paper**
    - Increased **competitiveness/globalisation**
      - Increased **client expectations** and needs
        - Increased **role of suppliers**.
      - Reduced project **time** cycle.
    - Changes in **skilled workforce**.

Project Team Integration:

Communication, Coordination & Decision Support

2002 – 2004

Research Partners

Queensland Government, Department of Main Roads

QUT

The University of Newcastle, Australia

Queensland Government, Department of Public Works

CSIRO

Aims & Objectives

- Demonstrate leadership in facilitating the use of innovative technologies.
- Identify appropriate hand-held technologies/applications.
- Examine construction industry and Government current state-of-play concerning e-Tendering.
- **Identify, examine & better understand the 'deeply embedded' culture of AEC industry.**
- **Develop a set of research and industry recommended guidelines.**

Industry Culture:

A Need for Change…

The "Human Touch"

Rockefeller Centre (1932)

Why Culture?

- Primary differentiation
- Last available 'mechanism'
- Focuses on communication at all levels
- Focuses on daily routines and 'sense-making'
- Focuses on largely ignored issues such as assumptions
- Offers a better insight to the managers and leaders
- It is pervasive and indistinguishable.

(Pepper G. L. 1995, Schein E. H. 1997)

Culture Defined

"Begins to form wherever a group has enough common experience" which inturn becomes the "property of that group"

(Schein E. H. 1999) p13.

"… influenced by traditions, myths, history and heritage...it is the sum of how we do things around here"

(Hensey M. 2001) p49.

"Pervades the decision-making and problem-solving process of the organisation, influencing the goals, means and manner of action…a source of motivation and de-motivation, of satisfaction and dissatisfaction, thereby underlining much of the human activity in an organisation"

(Williams A., Dobson P. et al. 1993) p15

"…a pattern of shared basic assumptions that has been learnt whilst solving problems, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems"

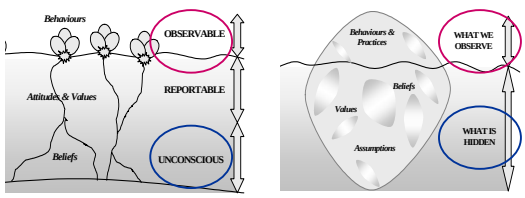
(Schein E. H. 1997) p12

Culture Defined

"…a set of values, attitudes, beliefs, meanings and assumptions that are shared by members of a group"

(Williams A., Dobson P. et al. 1993; Duarte D. L. and Snyder N. T. 2001)

The 'Lilly Pond' and 'Iceberg' of Culture



(Williams A., Dobson P. et al. 1993, Duarte D. L. and Snyder N. T. 2001)

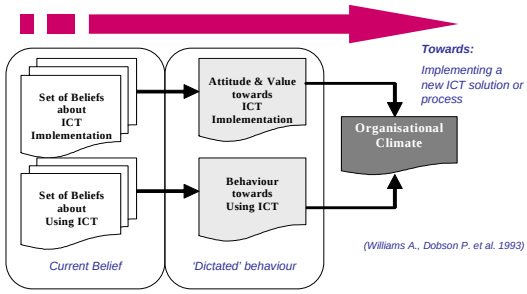
Identifying a Need for Change

"If you do not see a truck racing towards you, you are unlikely to jump out of the way…likewise, if you do not realise that you are standing on a treasure of gold, you are unlikely to bend down and pick it up"

"If people fail to see the need for change (whether driven by threat or opportunity), they will not change"

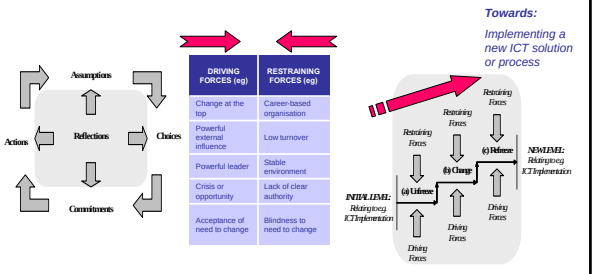
(Black J. S. and Gregersen H. B. 2002) p20

Towards Implementing ICT

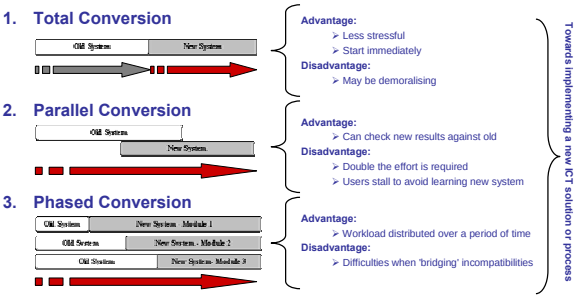


(Williams A., Dobson P. et al. 1993)

Change Processes/Models/Frameworks



Implementing Change (ICT)



Paulson B.C. (1995)

Technological Barriers

- ICT is more a cost factor rather than a value generator.
- ICT is bad business and equally non-contributing to replace old.
- Difficulty in secure & integrated ICT systems.
- Managers and employees satisfied and very use to the traditional way of doing business.
- Insufficient stakeholder drive.
- Too busy.
- The fear of potential embarrassment.

(Whyte J. 2002).

Drivers of Change

- Motivation
- Strong Leadership
- Training & Education

Cultural Barriers

"…one can't change culture overnight."

"Without fundamentally altering the 'old' culture...traditional ways of 'doing things' will tend to resurface."

Changing Culture

"When we know what culture is, we know what needs to be changed for culture to change…

..Only once we appreciate its nature can we understand how it might be changed…

..When we know its role, we can comprehend its importance."

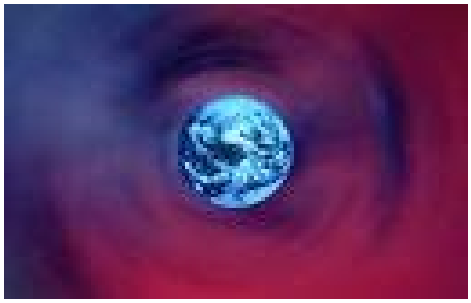
(Williams A., Dobson P. et al. 1993) p11.

24 Culture Change Principles

…an introduction to exposing the underlying need to transform the AEC industry's deeply embedded culture and resistive nature to technologically driven change…

… provide a 'preliminary guide' on how to adopt a more technology and culture driven change 'philosophy'

ICT Future



ICT Culture Change Framework

Provide project specific guidelines to help project team members (contractor, consultant, client, etc):

- Identify,
- Assess, and
- Potentially overcome individual or organisational cultural barriers during the implementation of a technological driven change.

Provide a quick and easy method for building and civil construction industry project team members:

- Assess their current levels of ICT adoption capabilities (i.e.: "are we ready?" Factor) and then
- Support them in transforming themselves from a "business-as-usual" team into an "exceptional ICT adaptable" team.

Conclusion

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"If you are serious about managing change… the biggest danger you face is that you do not fully appreciate the depth and power of culture."

(Schein E. H. 1999) p185

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