Knowledge Management for Learning

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Invited Keynote Presentation
KMICE ‘04
Penang, Malaysia

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Overview

- Background Issues
- The Knowledge Conundrum
- e-Books for Knowledge Management
- Knowledge Management for e-Learning
- Concluding Remarks
1. **Background Issues**

- People in Systems
- Consumers and Producers
- Soft Explosions!
- Complexity Issues
- Tools to Handle Complexity
- Knowledge Management
People in Systems

- People often exhibit complex behaviour
- People in systems introduce complexity
- People generate very large amounts of data, information and knowledge
- Sadly, human minds are fallible
- Humans have both physical and cognitive limitations
- Humans 'memory' shortcomings can often cause disasters!
People as Consumers of Knowledge (Media Effects)

- Newspapers
- Radio
- Conferences
- TV
- Telephone
- Conventional Mail
- Face-to-face
- Electronic Mail
- SMS Text Messages
- Web
People as Producers of Knowledge

Print
CD or DVD
Knowledge Processor
Data Capture Devices
Global Networks
Images and Video
Sound
Soft Explosions!

**Volume of Knowledge**

**Time Frame**

How do we develop coping strategies?
Quote from Computing Newspaper

Joe Tucci writing in Computing Newspaper, page 72, 16th October, 2003 - quantifying the ‘information explosion

“… the World had just created 1.5 billion gigabytes of information in the prior year alone …”

“… that is equivalent to 250 Mb of information for every man, woman and child on Earth …”

“… most new information is ‘born digital’, so IT is preserving for posterity an unprecedented record of human experience that otherwise would be lost …”
Volume of Knowledge in a Given Domain

Time Frame

Plateau

Decline

Rapid Growth

Time windows define the value of knowledge.
Complexity Issues

- Modern life is very complex
- Competition enhances choice
- Choice introduces complexity
- Complexity if not controlled can lead to chaos
- We need tools to handle complexity
- Knowledge Management is one such tool
- But there are others
The Problem of Choice!

- Competition implies Choice
- More Information is needed
- Harder to make decisions
- Chaos

“Organised Knowledge Combats Chaos”
Example: Vitamin Pills

Case 1:
1 type of pill - no choice - easy life!

Case 2:
20 variants of a pill
How do we choose the correct one?
Extra information needed to decide.
Greater time to make a decision.
Handling Complexity Issues

Growth in Knowledge and Information

Private Life

Tools for Handling Complexity

(Knowledge Management)

Public Sector
Tools for Handling Complexity

Knowledge Management

GST  EPSS  DRMS  e-Books  e-Learning

Electronic tools and artifacts to handle knowledge and lifelong learning.

Principle of Classification
Isomorphism
2. The Knowledge Conundrum

- What exactly is Knowledge?
- Where does it come from?
- The Role of Mental Models
- Interactive Learning
- Knowledge Assets
- How can we manage them?
- Knowledge-based Societies
What is Knowledge?

Knowledge is what we have 'in our heads' and which controls higher order behaviour.
What does it mean to know something?

X as stimulus

Talk about X

Write about X

Understand, reflect upon and make deductions and inferences about X

Magic Force
The records of events help us to build up a stock of knowledge of these events.

“History is lost unless it is recorded”
Mental Models Embed Knowledge

So, what causes the development of mental models?
Important Cognitive Processes

It is imperative that we understand the nature of some of the basic processes that influence the development of mental models:

- **Realisation**
  that you do not know something

- **Motivation**
  to want to learn something

- **Learning**
  constructivist learning builds knowledge structures

- **Interaction**
  with others, learning events and knowledge corpora

- **Reflection**
  analysing situations & creating new knowledge internally

- **Testing**
  how accurate and useful is the knowledge we have?
Interactive Learning Environments

Global Knowledge Pool

Individual's Mental Models

Create, recall and update

Skill Set

Student-Centred EPSS Facility

Colleagues

Technology-mediated communication

Task Execution

Problem Domain

New knowledge/skill acquisition
Accumulating Knowledge Assets

People

Knowledge Assets

Event-Driven Processes
Building a Knowledge-based Society

People

Learning
Controlling

Signals
Information
Data

Observation
Recording

Signs
Knowledge

Commodities

Share-ability
Utility

Security
Privacy

Currency
Longevity

Storage

Share-ability
Utility

Security
Privacy

Currency
Longevity

E1

E2
Managing Knowledge

Knowledge Assets --- electronic artifacts --- access to artifacts
(e-books) (e-universities)
3. Using Electronic Books

- The Theory
- The Book Metaphor
- Basic Tools
- An Example - GPS Navigation
My Basic Theory

Because we live in an era of dynamic change, we need new electronic artifacts to help us cope with the growing amounts of knowledge and information that we need in order to survive.
Basic Tools

- The computer as a 'knowledge archive' (assumes the availability of e-knowledge)

- Global networks such as the Internet and personal intranets

- Hand-held portable devices linked to both private and public knowledge networks

- Metaphorical artifacts like electronic books are needed to help users navigate through complex electronic corpora
The Book Metaphor

Electronic Library → Bookshelf → Book

[Index] + [Contents]

E-Book

Index

Search Engine
Example: Navigating with a GPS

**Electronic Maps**
Complete UK coverage at 1:25,000 scale

**Walk e-Book**
Personalised maps, route details, tracks, notes and pictures, etc.

**GPS Navigator**
Routes and/or Tracks

**Mouse**
Defining a Route

CRT Screen

OS Map 1:25,000

A

B

Distance

Height

A

B

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A Walking Expedition

Electronic navigation and Tracking

GPS Electronic Compass

Start [A]

Track Log

Finish [B]

PDA

Camera

Speech recorder

Electronic navigation

and Tracking
Publishing my Walks e-Book

Walks e-Book

World Wide Web

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4. KM for Electronic Learning

• Rationale
• Online Courses (e-Learning)
• Virtual University Concept
• Web-based Learning Facilities
• An Example - VUSIL
Rationale for e-Learning

- Rapid Change
- Skills go out of date
- Need to continually 're-learn'
- Lifelong learning is important
- New approaches to learning needed
- Importance of 'e-knowledge'
Online Courses

Some Examples:

MDA3005 - University of Teesside
TU170 - Open University
T171 - Open University

More and more courses are being made available online

Virtual Universities are a very useful knowledge management concept
**Definition of a VU**

A Virtual University is:

“… one which exists only within the confines of a cyberspace environment that is created using a suitably configured host computer system.”

British Initiatives

(1) The University for Industry (UfI)
(2) UK eUniversities Worldwide (UKeU)

“UKeU delivers the best of UK University Education online. We enable students across the world to study for recognised UK qualifications, using the Internet, anywhere and at any time.”

(http://www.ukeu.com)
VUSIL
(Virtual University Server in Lebanon)

**Basic Objective:**
To build a VU system and explore users’ attitudes to using such a system for studying.

**Basic Hypothesis:**
“The availability of a digital university system is both an acceptable and an effective way of supporting learning activities for lifelong learners (in Lebanon).”
**VUSIL Components**

- Administration Office
- Lecture Hall
- Electronic Library
- Course Catalogue
  - “Internet Basics” Course
  - “Advanced Internet” Course
- Forum Facility
- Developer’s Toolbox
Our Evaluation Findings

- Needs analysis used to identify audience and courses to develop
- Pilot Study identified changes that needed to be made
- Fully-fledged evaluation (110 online users)
- Pre-tests and post-tests used to assess knowledge acquisition
- Questionnaires used to collect attitudinal data
- Regression analysis used to explore relationships between experimental variables
- Results provided evidence for our initial hypothesis
5. Concluding Remarks

- Knowledge is a 'dynamic' commodity
- Because of the rapid changes taking place in the world, we continually need to review the 'adequacy' of what we know
- Skill and knowledge updating are vital for the survival of individuals, groups and nations
- New electronic artefacts are needed to facilitate this task
- Electronic books are useful KM tools
Concluding Remarks (Continued ...)

- Virtual universities are a useful and powerful knowledge management and dissemination tools.
- However, we need to continue the search for new KM artefacts and easier to use knowledge representation techniques for e-knowledge.
- Most people have computers but do not understand what is involved in representing their knowledge within them.
- Thank you for listening to me!
- Enjoy the rest of KM ICE 04.
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