



Digital Scholarship & the role of the university library

University of Botswana and Digital Scholarship conference
12-13 December 2007, Gaborone, Botswana

Dr Heila Pienaar, Deputy Director:
e-Information Strategy & e-Research Enablement
Library Services



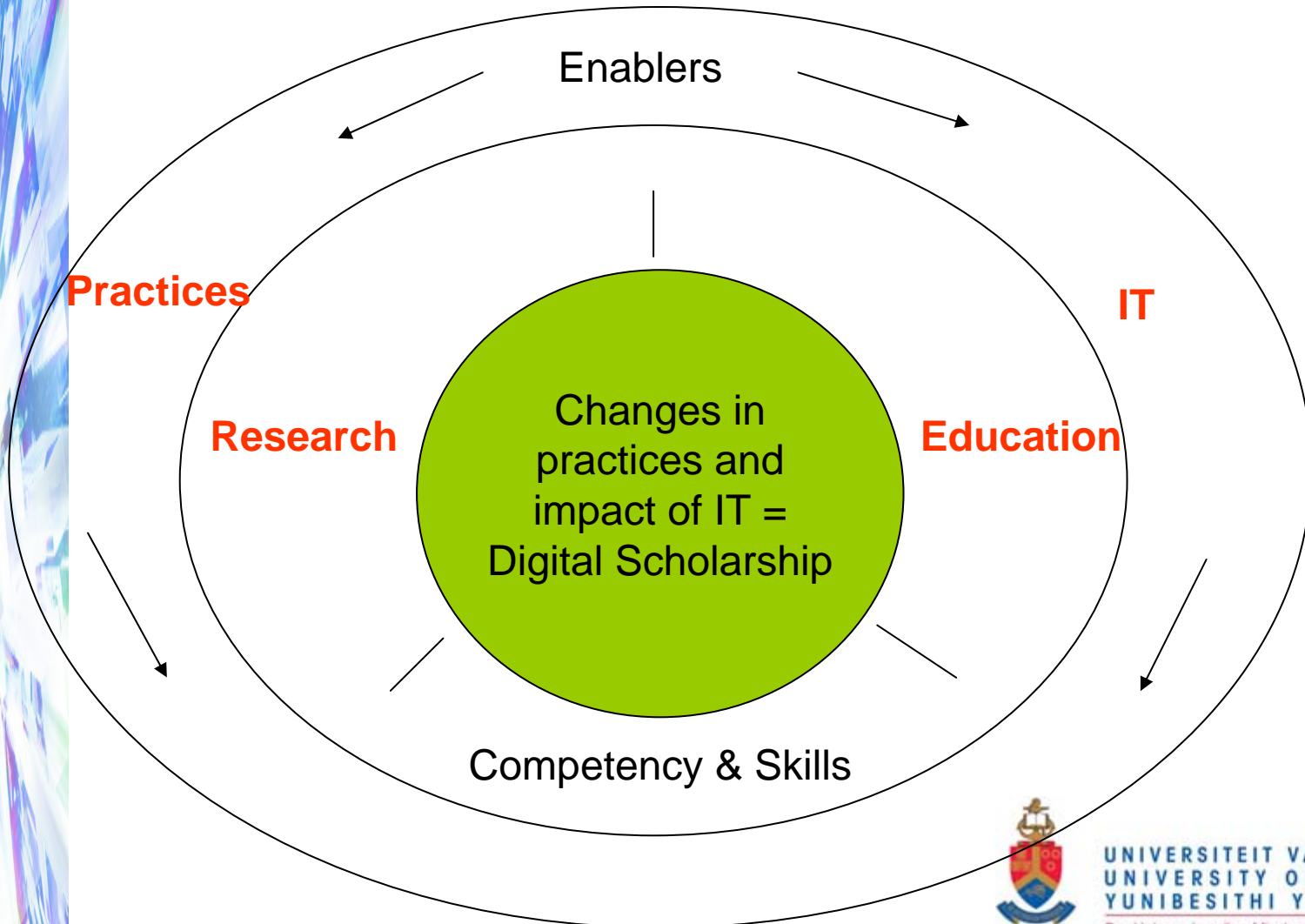
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Content

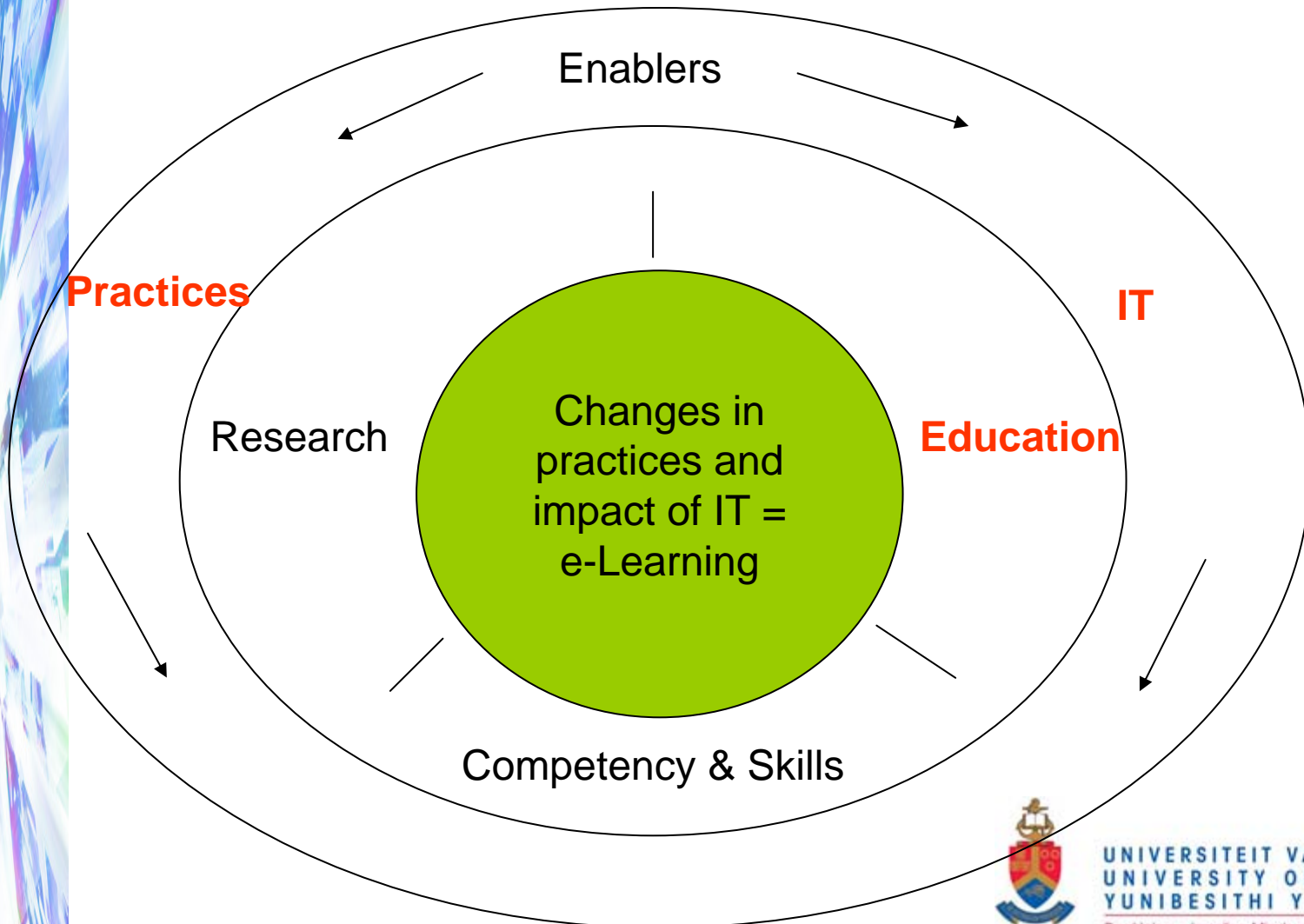
- Changes in practices and impact of IT = Digital Scholarship (DS)
 - e-Learning
 - e-Research
- How the university library can enable Digital Scholarship:
 - e-Research
 - e-Learning
 - e-Resources
 - Open Scholarship
 - Digitisation
 - Web / Library 2
 - Repositories
 - Library Web



Changes in practices and impact of IT = Digital Scholarship (DS)



Changes in practices and impact of IT = e-Learning



Example of changes in education practices: Behaviourism & Constructivism

- **Behaviourism:**
- Operates on **overt behaviour**
- The goal is behavioural change, performance
- **Well-defined domains**
- Recipients are students
- **World view is objective, universal reality – to be imparted to learner**
- **Constructivism:**
- Operates on performance of **authentic tasks**
- The goal is meaning interpreted from experience
- **Domain: ill-defined, real-world situations**
- Recipients are learners
- **World view is personal, subjective interpretation of reality; social negotiation of meaning in a collaborative environment.**

<http://upetd.up.ac.za/thesis/available/etd-02212003->

[180121/unrestricted/04chapter4.pdf](http://upetd.up.ac.za/thesis/available/etd-02212003-180121/unrestricted/04chapter4.pdf)



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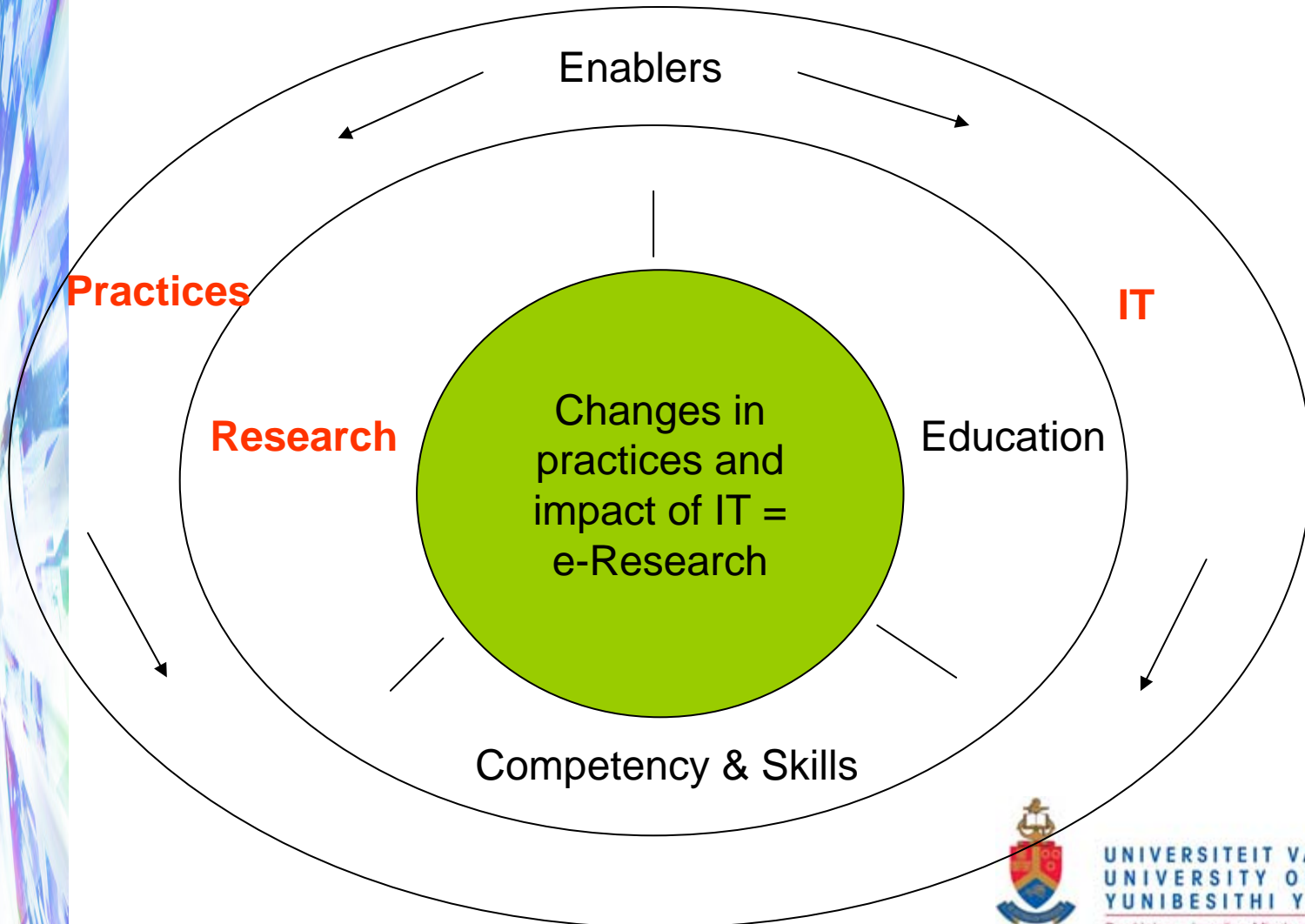
Examples of impact of IT on education

- **Earliest applications involve the enhancement of traditional courses**
- The most dramatic impacts on university education are **yet to come** – when learning experiences are re-conceptualised to capture the power of IT:
 - Interactive, collaborative learning in a media-rich environment
 - Web communities (living-learning paradigm)
 - Consultant and coach rather than teacher – “faculty may come to interact with undergraduates in ways that resemble how they interact with their doctoral students today”
 - Students may co-create learning environments

(<http://books.nap.edu/books/030908640X/html/index.html>)



Changes in practices and impact of IT = e-Research



Example of changes in research practices: Mode 1 & Mode 2 knowledge production

- **Mode 1 is:**
 - Discipline based
 - Carries a distinction between pure (or fundamental) and applied
 - Normally produced by individuals
 - Produced in universities or traditional research centres
 - Subject to quality control by peer review
 - Is inherently local or localised
- **Mode 2 is:**
 - Trans-disciplinary
 - Produced in the context of application
 - Heterogeneous in terms of the skills and experience brought to it
 - Produced in diverse sites
 - Characterised by the production in teams
 - Subject to social accountability and reflexivity
 - Subject to the quality control of market acceptability as well as peer review
 - Global or non-localised.

<http://www.aare.edu.au/01pap/hea01582.htm>



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Examples of impact of IT on research

- IT is changing the **nature of research**
- Previously **unsolvable problems** can be tackled: custom-designing new organic modules; analyzing the complex dynamics of the global climate etc
- A **fourth modality** of research has been created: simulation of natural phenomena (**in silico research**)
- New types of research organizations, such as “**collaboratories**” (far-flung networks of researchers and laboratories)
- **Humanities, social sciences and the arts**: some of the most powerful IT applications
 - Virtual reality simulations of remote sites are developed by archeologists
 - Analyzing of massive data sets (social scientists)
 - Multi-media: creation of new art forms



Case study: Integrative Biology (in silico cancer & heart research) - Virtual Research Environment (IB VRE)

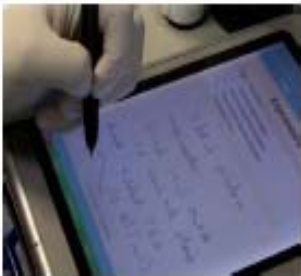
- The IB research consortium is a **globally-distributed, inter-disciplinary** team engaged in constructing **computer models** in order to further understand heart disease & cancer
- VRE project aims to provide a **single, integrated environment** supporting the entire research **process** from experimental and simulated data generation, acquisition, analysis and curation, through access to experimental resources, to project management, administration, and learning and teaching support tools (<http://www.jisc.ac.uk/index.cfm?name=ibvre&src=alpha>)





Matchmaking

Lab book



Getting Funding



Collaborative/communication

Resource discovery



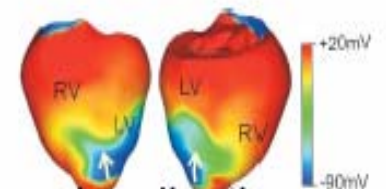
In-silico experiments



Event Management

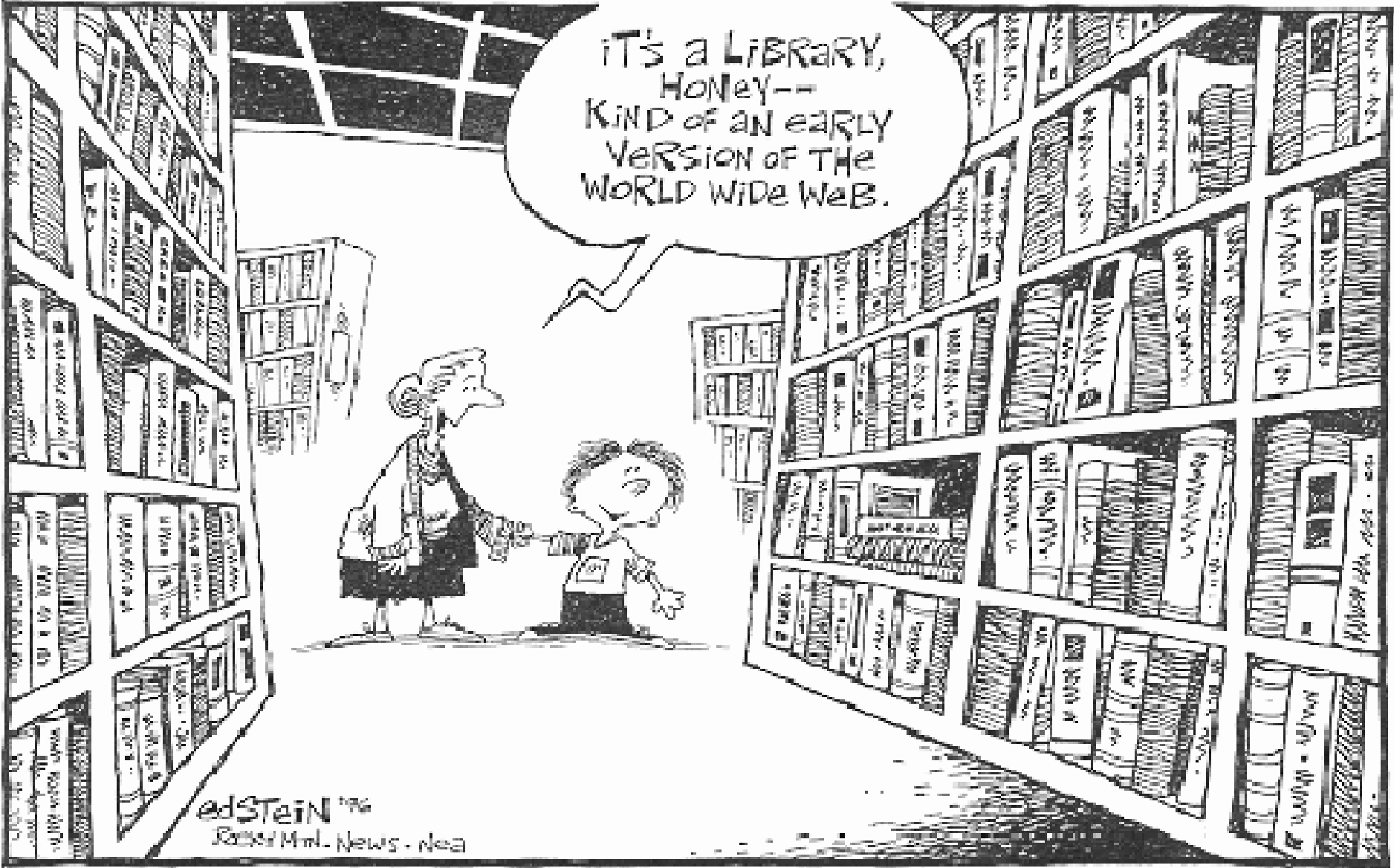


Dissemination

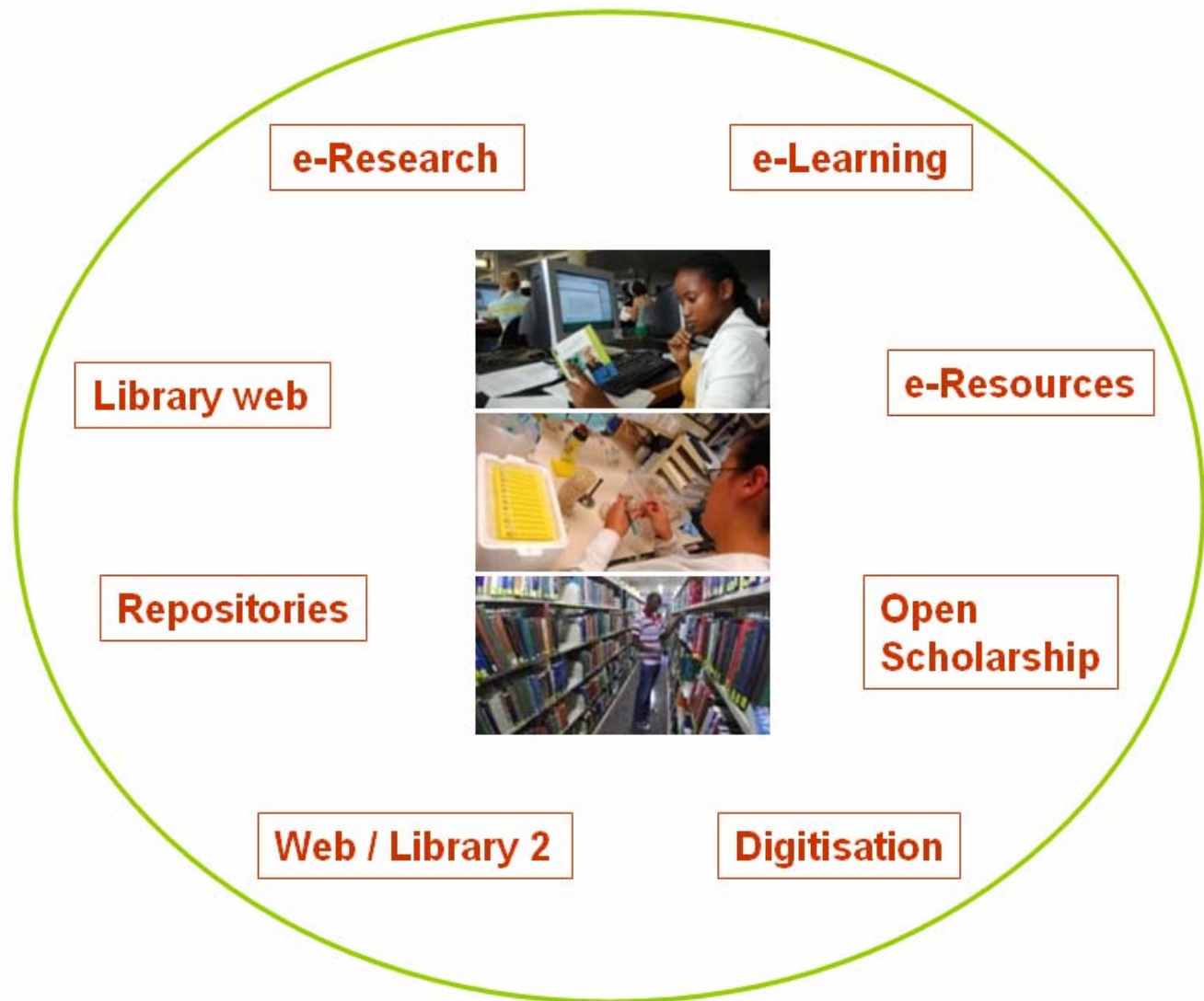


visualisation

How the university library can enable Digital Scholarship



e-Environment for Scholarship

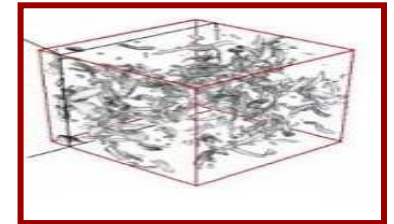


e-Research

- **Thousand years ago:**
Experimental Science
 - description of natural phenomena
- **Last few hundred years:**
Theoretical Science
 - Newton's Laws, Maxwell's Equations ...
- **Last few decades:**
Computational Science
 - simulation of complex phenomena
- **Today:**
e-Science or Data-centric Science
 - unify theory, experiment, and simulation
 - using data exploration and data mining
 - Data captured by instruments
 - Data generated by simulations
 - Data generated by sensor networks
 - Scientist analyzes databases/files



$$\left(\frac{\dot{a}}{a}\right)^2 = \frac{4\pi G\rho}{3} - K \frac{c^2}{a^2}$$

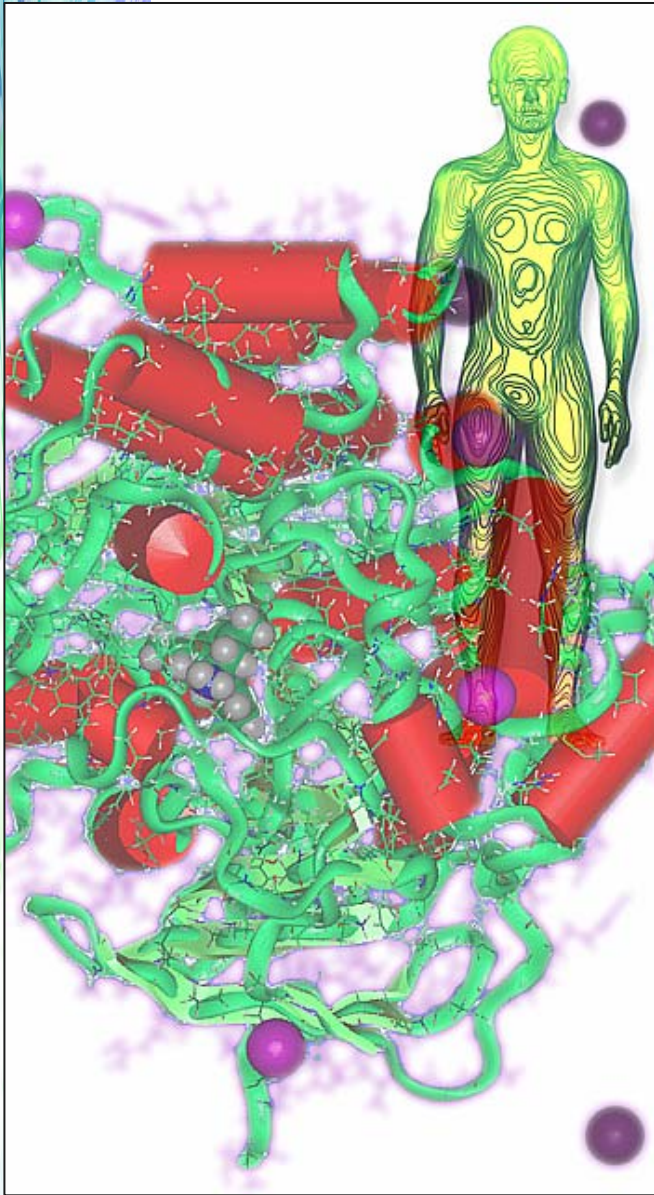


© 2006 Tony Hey

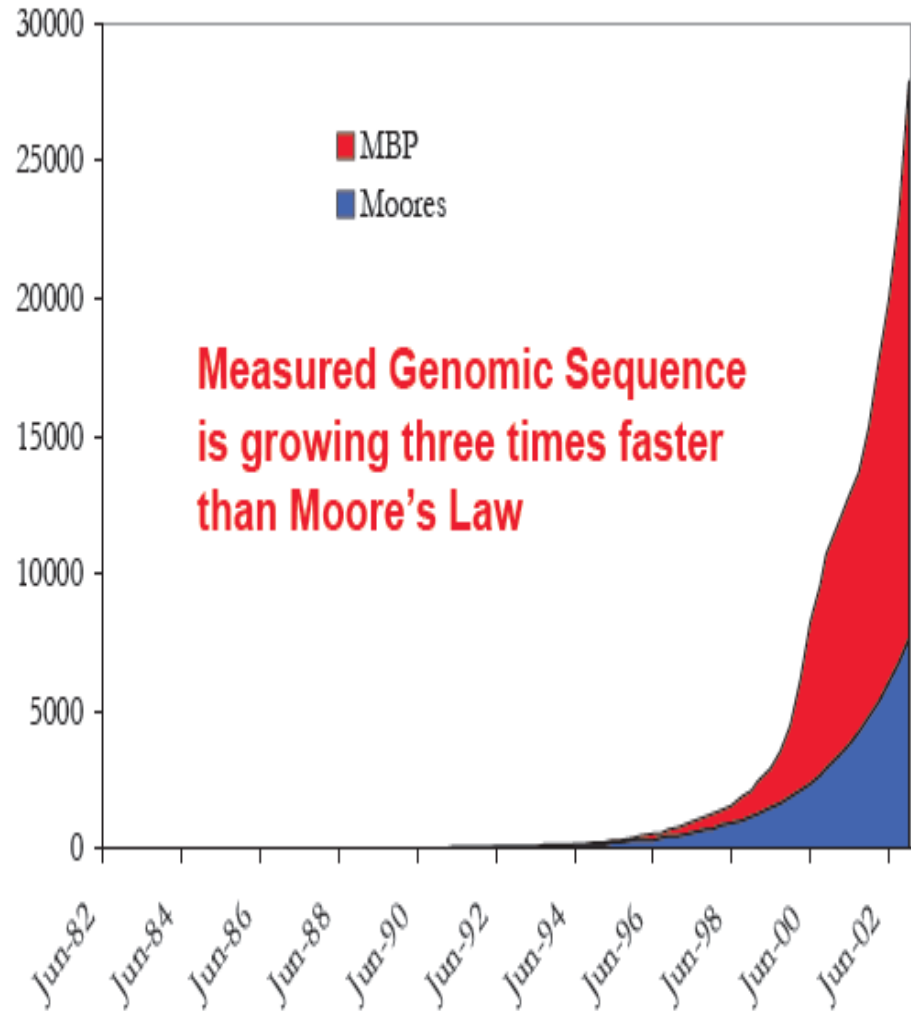


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The Genomic Data Explosion



Courtesy:
Graham Cameron



Chris Jones
Sciences on the GRID
February 2006
5


Data curation

African digital conference - Microsoft Internet Explorer

File

<http://stardata.nrf.ac.za/nadicc/>

Address <http://stardata.nrf.ac.za/nadicc/programme.html> Go Links >>

 Ist African Digital Curation Conference

[Home](#) | [Registration](#) | [Accommodation](#)

1st African Digital Management and Curation Conference and Workshop

12 and 13 February 2008, at the CSIR Convention Centre, Pretoria


Preliminary Programme


Conference fee: R2 500 p/p

Day 1: Conference


08:00 – 08:30	Registration
08:30 – 09:00	Welcome and Keynote: The implications of the OECD declaration for African/ South African policy on research data and information management and curation, <i>Department of Science and Technology representative</i>
09:00 – 11:00	Theme 1: Overview : International trends <ul style="list-style-type: none">eScience : providing context, <i>Hans Falk Hoffmann, CERN</i>International data policy overview, <i>Paul Uhlir Director, Office of International S&T Information Programs and</i>


A collaborative initiative in the auspices of:

 science & technology
Department: Science and Technology
REPUBLIC OF SOUTH AFRICA

 ASSAf
ACADEMY OF SCIENCE OF SOUTH AFRICA

Collaborative partner:

 NRF
National Research Foundation

 HSRC

Research Data Life Cycle

- Data acquisition
- Data ingest
- Metadata
- Annotation
- Provenance
- Data storage
- Data cleansing
- Data mining
- Curation
- Preservation

The Distributed Data Curation Center (D2C2), managed by the Purdue University Libraries ...

File Edit

Back

Address

Go

Links

PURDUE
UNIVERSITY

Libraries

Access. Knowledge. Success.

Quick Links

- ▶ Your Library Account
- ▶ Interlibrary Loan
- ▶ Course Reserves
- ▶ Hours
- ▶ Maps

About

Help

Catalogs

Libraries and
UnitsArticles and
DatabasesGuides and
Instruction

Giving

Ask a Librarian

The Distributed Data Curation Center

The Distributed Data Curation Center (D2C2), managed by the Purdue University Libraries, investigates and pursues innovative solutions for curation issues of organizing, facilitating access to, archiving for and preserving research data and data sets in complex environments. Current D2C2 outcomes include interaction with the DIR which serves as a platform for investigation of data curation issues and development of applications to determine controlled access for data and to help solve data archiving and preservation problems that arise in several research domains, such as agriculture and energy. [more...](#)



Funding Opportunitites (NSF)

Protein Data Bank Management

(NSF 08-507) November 7, 2007

The goal of this solicitation is to ensure the continuing, highest possible quality of management for the central, U.S. component of the Protein Data Bank ...

Current Projects

Ingest, Preservation and Access for Water Quality Datasets in an Institutional Repository

Center for the Environment @ Discovery Park-Purdue
Marianne Bracke(Sen. Pers.); Michael Witt(PI); Sylvie Brouder (co-PI)

Investigating Data Curation Profiles Across Multiple Research Disciplines

Institute of Museum and Library Services
Scott Brandt(PI); Michael Witt(co-PI); Jake Carlson(co-PI)

Metasearch Technologies for the NSDL Distributed Community

National Science Foundation
Paul Bracke(PI)

Development of an OAI-PMH Interface for nanoHUB.org

Network for Computational Nanotechnology
Michael Witt(PI)

Sun STK 5800 Storage System

Sun Microsystems
Michael Witt(PI)

Recent Proposals

Enabling end-to-end geospatial data modeling workflows via INPort: The Isotope Networks Portal

National Science Foundation
Christopher Miller(co-PI); Tonglin Zhang(co-PI);

Virtual Research Environment (VRE) for Malaria research in SA

The purpose of a VRE is to help researchers in **all disciplines** manage the increasingly complex range of tasks involved in carrying out research. A VRE will provide a **framework of resources** to support the underlying processes of research on both small and large scales.

http://www.jisc.ac.uk/whatwedo/programmes/programme_vre.aspx#VRE



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Malaria VRE Initiative

- The Malaria VRE initiative is a combined **UP / CSIR** project
- During 2007 several **interviews** were held with malaria researchers from UP, CSIR, UCT, US and MRC.
- The interviews focussed on “**a day in the life**” of a malaria researcher and also established if researchers are aware of **future technology needs that will improve their efficiency & creativity**.
- The project leaders, dr Heila Pienaar (UP Library) and dr Martie van Deventer (CSIR Library) created a **conceptual model** of the systems, tools, processes, workflows, etc that need to be integrated to improve efficiency & creativity in malaria research.
- These findings were validated by building a **demonstrator** of the proposed Malaria VRE.
- The next step will be to develop a **VRE system** for use by die SA Malaria Initiative (SAMI), an initiative of the African Centre for Gene Technology (ACGT) and a quotation for this development has already been received.



Malaria VRE components

Red: none
Orange: some
Yellow: all

Repositories:
research results;
experiments;
literature &
documents

Web/wiki/blog: search engines,
databases; researchers &
topics; funders, portals,
communication, projects

Identification of
research area

Literature review &
indexing

**Internal shared
database of
indexed articles**

Dissemination &
artifacts

Identification of
collaborators

**Document
management
system**

**Skype, smart
board, video
conferences**

Real time
communication



Proposal writing

**E-learning
system for
researchers**

Training / mentoring
etc

Identification of
funding sources

**Generic
software e.g.
MS / Open
Office**

**(Collaborative)
Electronic Lab
book**

Scientific workflow

Project management

**Project
management
system**

**Servers with
data files**

**Sophisticated
instruments that
generate digital
information and data**

**Access to
research
networks &
super
computers;
access to labs
with in silico
screening +**

**Integrated
data
management
system**

**Mathematical modelling tools;
numerical algorithm tools; simulation
software; in silico experiments**

**(Free) Data
analysis
software**

Malaria VRE Demonstrator



South African Malaria Initiative

User Menu

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Search

Advanced Search

New Members

heila1	2007/7/10
kate	2007/7/4
eskosana	2007/7/4
mmphahlele	2007/7/3
cackroyd	2007/7/3
iimenda	2007/7/3
rmaidi	2007/7/3
lkgasoane	2007/7/3
martie	2007/7/3

Blog

Linda's Lab Book and Scientific Workflow of

Research 

Wiki

Identification of collaborators and

funding 


DSpace

Dissemination and Artefacts/Literature

review 

WebCollab

Project Management for

the research team 

Sakai

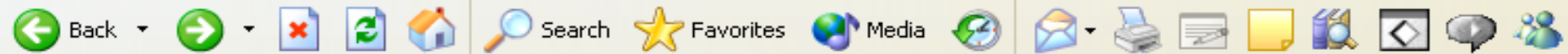
Training and mentoring

for the researchers 

e-Learning

Blackboard Learning System - Microsoft Internet Explorer

File Edit View Favorites Tools Help



Address <http://elearn.up.ac.za/webct/urw/lc4130011.tp0/cobaltMainFrame.dowebct?appforward=startFrameSet.dowebct%3Fforw> Go Links

University of Pretoria
Universiteit van Pretoria

[Accessibility](#) | [Help](#)

Build

Student View

ile802 - ile802_s01_2007

Your location: [Home Page](#) > **AIS References**



ACADEMIC INFORMATION SERVICE

Engineering, Built Environment and Information Technology



ile801/2

Life Cycle Management (LCM) of Safety, Health and the
Environment (SHE)

2007

Prescribed Literature:
Theme 1, 2 and 3

Supplementary Reading : Theme 3 :
Life Cycle Management

E-Resources

International
Websites

Prescribed Literature

Theme 1: Health and Safety Management

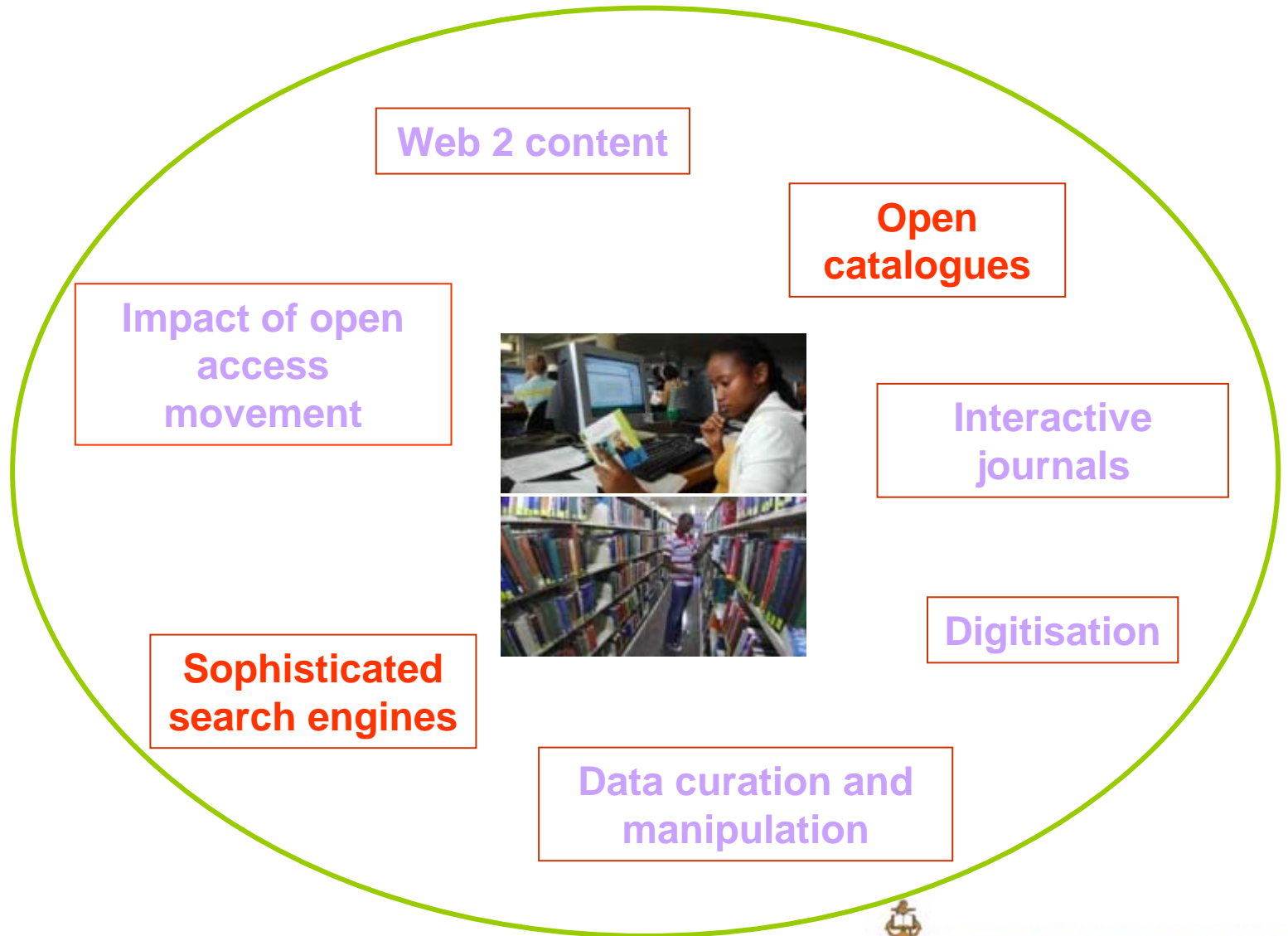
Honkasalo, A. (2000) *Occupational health and safety and environmental management systems. Environmental Science and Policy*, vol. 3, pp.39-45, [113 kb]

Moult, D.; Knowles, J. (2001); *Auditing safety: a client and consultant's perspective. Operations*

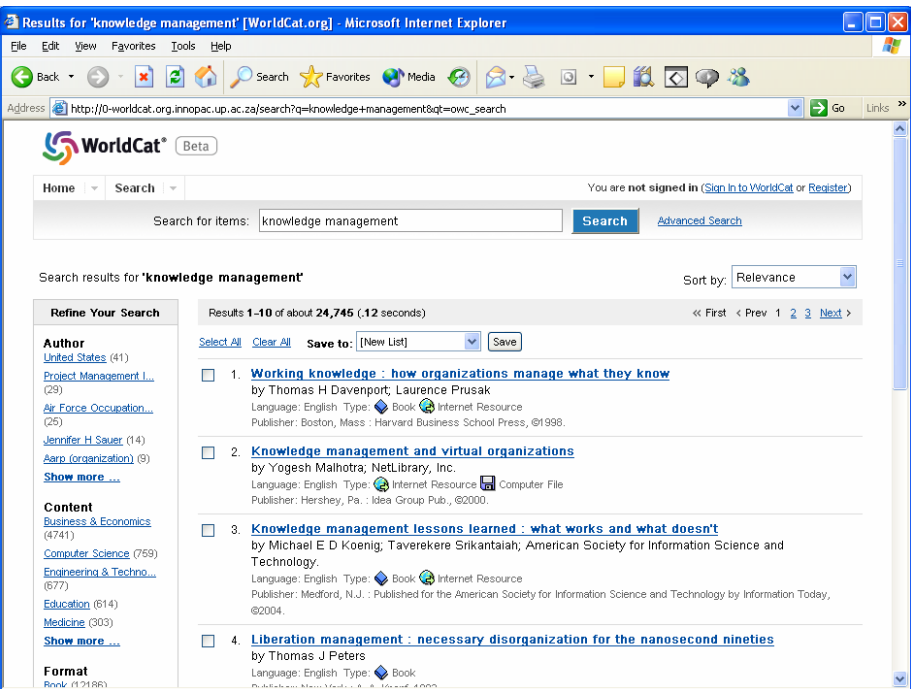
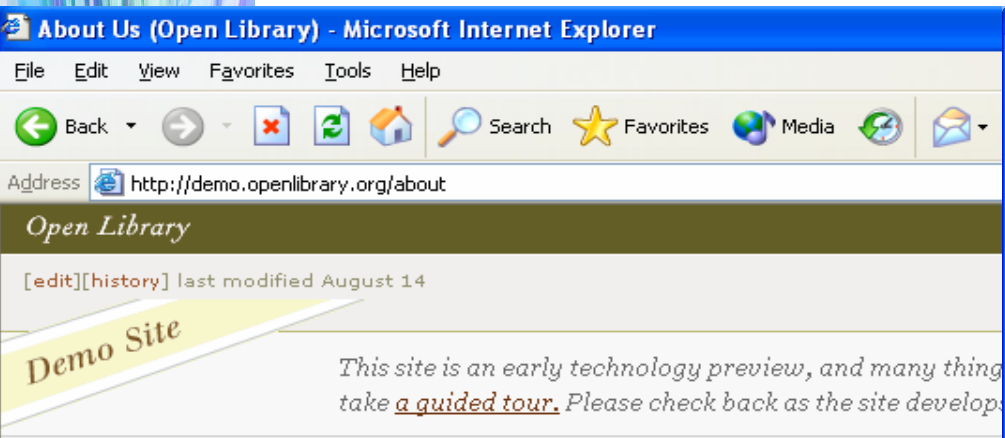
 AIS
AIS
Homepage

 eResource
Collection
of E
Resources

e-Resources



Open catalogues



[← Back to "About the Open Library"](#)

About Us

What if there was a library which held every book? Not every book on sale, or every important book, or even every book in English, but simply every book—a key part of our planet's cultural legacy.

First, the public we and that o

...a product of the people: letting them create and curate its catalog, contribute to its content, participate in its governance, and have full, free access to its data. In an era where library data and Internet databases are being run by money-seeking companies behind closed doors, it's more important than ever to be open

Second, i catalog e

would link to places where each book could be bought, borrowed, or downloaded. It would collect reviews and references and discussions and every other piece of data about the book it could get its hands on.

But most importantly, such a library must be fully open. Not simply "free to the people," as the grand banner across the Carnegie Library of Pittsburgh proclaims, but a product of the people: letting them create and curate its catalog, contribute to its governance, and have full, free access to its data. In an era where library data and Internet databases are being run by money-seeking companies behind closed doors, it's more important than ever to be open.

Sophisticated search engines

Proponents of AI techniques

say that one day people will be able to search for the plot of a novel, or list all the politicians who said something negative about the environment in the last five years, or find out where to buy an umbrella just spotted on the street. Techniques in AI such as **natural language**, **object recognition** and **statistical machine learning** will begin to stoke the imagination of Web searchers once again.

http://www.news.com/Spying-an-intelligent-search-engine/2100-1032_3-6107048.html

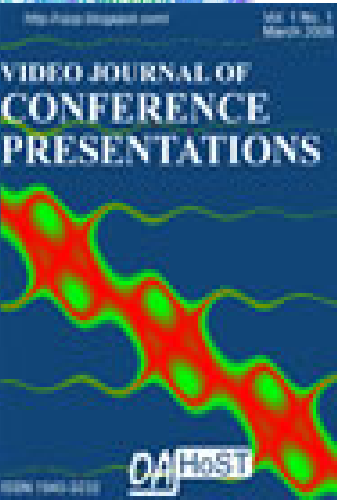
The top screenshot shows a Google Scholar search for 'knowledge management'. The results list several articles, including 'The knowledge management toolkit: practical techniques system' by A. Twana (2000) and 'Building Successful Knowledge Management Projects' by TH Davenport and DW De Long (2000).

The bottom screenshot shows the Encore library search engine. The search term 'knowledge management' has yielded 1217 results. The interface includes filters for 'Refine by' (Subject, Title, Author, etc.), 'Format' (Printed Material, Electronic Resource, etc.), and 'Language'. The search results are sorted by relevance, with the most relevant results displayed first. The first result is 'Knowledge management in the public sector: a blueprint for innovation in government' by McNabby, David E. (2007). Other results include 'Cross-cultural perspectives on knowledge management' and 'Appreciative inquiry and knowledge management: a social constructionist perspective'.

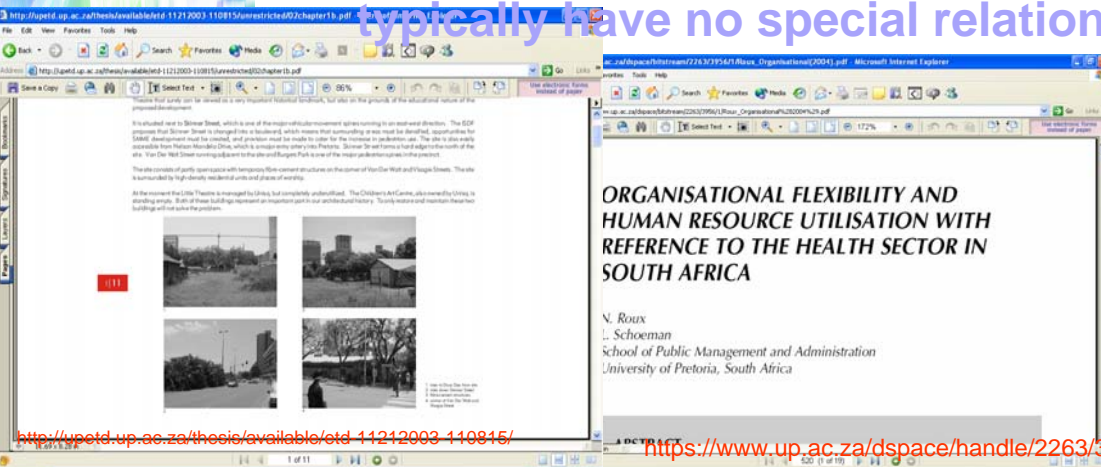
Open Scholarship

- Libraries Can Provide **Enhanced Access** to OA Works
- Libraries Can Be **Digital Publishers** of OA Works
- Libraries Can **Build Specialized OA Systems**
- Libraries Can **Digitize** OA Versions of Out-of-Copyright Works
- Libraries Can **Preserve** OA Materials
- Libraries Can **Subsidize Author Fees**

“The identification of desirable OA materials is more challenging than the identification of conventional electronic materials because there are a large number of potential suppliers, not a limited number of commercial vendors, and these suppliers typically have no special relationship to the library.”



<http://vjcp.blogspot.com/2007/10/blog-post.html>



<http://upetd.up.ac.za/thesis/available/otd/11212003/110815/>

<https://www.up.ac.za/dspace/handle/2263/3956>

Open Access & Libraries
<http://www.escholarlypub.com/cwb/OALibraries2.pdf>



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Digitisation

benefit

years to mainstream adoption

Global digitisation projects

less than 2 years

2 to 5 years

5 to 10 years

more than 10 years

transformational

Internet2/Next Generation Internet
Personally Owned Devices With Campus Network Access

IP Video for E-Learning

E-Learning Repositories

Global Library Digitalization Projects

high

802.11x on Campus
Course Management Systems
Higher Education Enterprise Portals
Web Services for Administrative Applications

CRM for Enrollment Management
ID and Access Management
Learning Content Management
Next-Generation Library Management Systems
Open-Source E-Learning Applications

With everything on the Net – what is left for academic libraries?

©University of Pretoria - Veterinary Science:
Department Anatomy and Physiology



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Gartner

Web 2 examples

- **Web 2.0**

- Users build networks (professional, recreational etc.)
- People are the content of sites (O'Reilly)
- Emphasize online sharing and collaboration

- **2.0-style Service Examples**

- Google Scholar & Scholar SFX
- User tagging, ratings & comments
- Mashups, Wikis, Blogs, RSS-feeds
- Community citation (CiteULike), photo and book services
- Websites with 2.0 characteristics: Flickr, eBay, De.licio.us (social bookmarking), MySpace, MyTube, LibraryThing



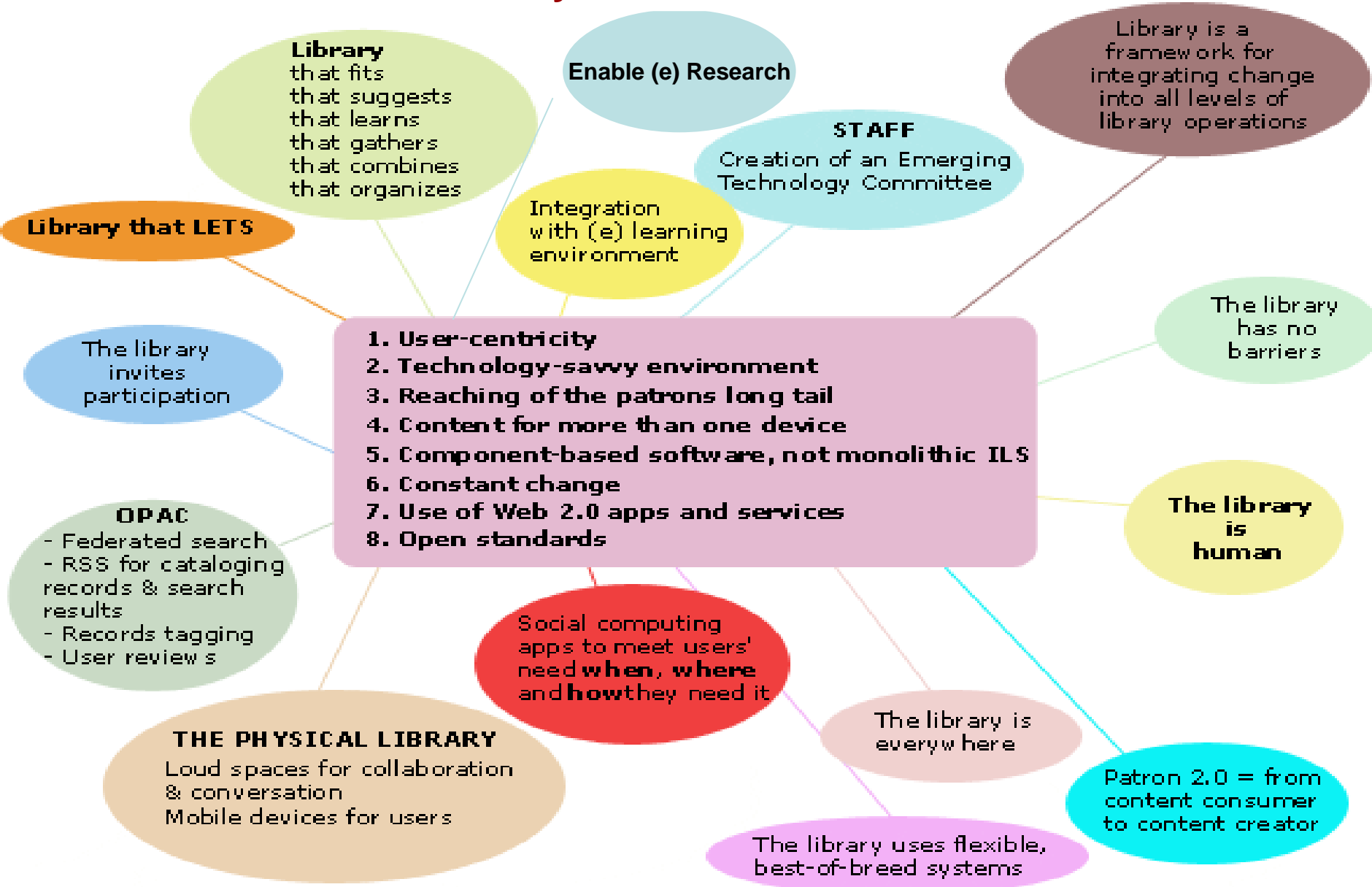
Library 1.0 vs Library 2.0

- Closed collections
- Collection development
- Pre-organized catalogue
- Walk-in services
- “Read-only” catalogue
- Print newsletter mailed
- Easy = Dumb users
- Limited service options
- Focus on bringing them in
- Catalogue is core operation
- Open collections
- Library suggestion box
- User tagging
- Globally available services
- Amazon-style comments
- Team-built blog
- Easy = Smart systems
- Broad range of options
- Focus on finding the user
- User services are core

(Schneider 2007)



Library 2.0 Service Model



Wiki: UPSpace Visitors' Book

UPSpace Electronic Visitors' Book

Welcome to the visitors' area for UPSpace, the digital research repository of the University of Pretoria. UPSpace can be accessed from <https://www.up.ac.za/dspace/>

Feel free to share your experiences regarding UPSpace with us! To contribute:

1. Click on *Edit This Page*.
2. Type your message at the bottom of the page.
3. Remember to click on *Save* when finished typing.

Do you want to learn more about UPSpace?
Please provide your interest and contact details in this area or e-mail upspace@up.ac.za

"I am sure that UP Space will greatly benefit Mapungubwe." - Sian Tiley-Nel, Personal E-Mail Communication, April 20, 2006

"I could access everything, it's a fantastic site! Thank you so very much for alerting me to it!" - Christopher Vermon, Senior Lecturer, Faculty of Architecture, Landscape and Visual Arts, The University of Western

UP Library examples

E-BOOKS@TUKS Information Blog

Thursday, November 02, 2006

Google Book Search
<http://books.google.com/>

An information weblog for personal and students about the e-book

Google book search is a tool from google that searches the full text of books that Google scans and stores in its digital database. The service was formerly known as Google Print when it was introduced at the Frankfurt Book Fair in October 2004. On November 17, 2005 Google officially changed the name Google Print to Google Book Search. (From Wikipedia, the free encyclopedia, November 2, 2006.)

On the Google Book Search homepage they stated: "Search the full text of books to find ones that interest you and learn where to buy or borrow them" and also "The aim of Google Book Search is

Blog: E-Books

FEDERATED SEARCH ENGINES AND LINK RESOLVERS

PROGRESS REPORTS OF MEMBERS OF THE WORKGROUP FOR FEDERATED SEARCHING AT THE ACADEMIC INFORMATION SERVICE, UNIVERSITY OF PRETORIA

FRIDAY, AUGUST 04, 2006

from the evaluation we managed to list them according to our preferences, but none were fully up to our standards at the time (November 2005). We instead decided to go for the Google Scholar option. We use Google Scholar as our federated search engine (also to search across subscription e-resources), and

Blog: Federated Search Engine

PREVIOUS POSTS

Solution for clients of the University of Pretoria English (South Africa)

Blog: Community Project

CULTURAL LESSONS

THIS BLOG IS A FORUM FOR STUDENTS FROM GATANG COMPREHENSIVE SCHOOL IN MAMELODI, PRETORIA, PARKWAY NORTHWEST HIGH SCHOOL IN PHILADELPHIA, PA AND TEEN VOLUNTEERS AT THE SHERMAN LIBRARY IN FORT LAUDERDALE, FLA. TO EXCHANGE IDEAS, THOUGHTS, AND INFORMATION ABOUT THEIR LIVES AND COMMUNITIES.

APRIL 23, 2007

from South Africa!

Contributors: Ina, Paula, Devon, Robin the Librarian

STUDENT PHOTOS: <http://www.flickr.com/photos/culturallessons/>

Parkway Northwest on Flickr - Photo Sharing!

Address: <http://www.flickr.com/photos/culturallessons/472006095/>

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Search everyone's photos Search

Parkway Northwest

Uploaded on April 26, 2007 by [pmsmith13](#)

pmsmith13's photostream

You are at the last photo 25 photos View as slideshow

This photo also belongs to:

- Parkway Students (Set)

You are at the first photo You are at the last photo 1 photo

flickr: Community Project

Parkway Northwest

Goodwill Skosana

Parkway Students 1 photo

Precious Ndlovu

Nelly Malebe

Mamelodi Students 24 photos

Search

Fly To Find Businesses Directions

From e.g., Toronto, Canada

"Ou Lettere Building" lat=-25.754;

To e.g., 4 Yawkey Way Boston MA

"Ou Lettere Building" lat=-25.754;

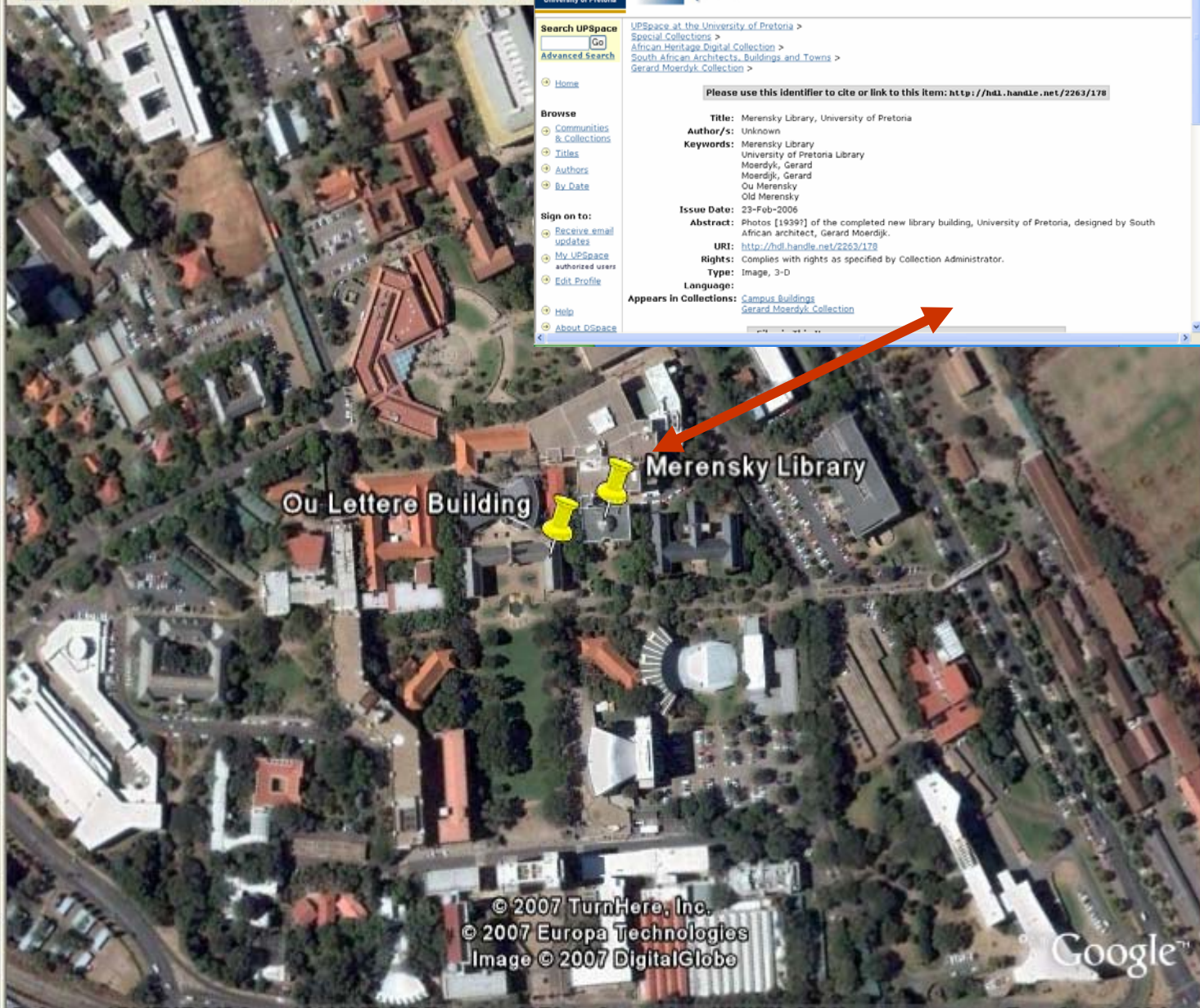
- university of pretoria (1 - 10)
- Web Results
 - KML/KMZ content from the er Web.
 - Merensky Library
 - Ou Lettere Front
 - Ou Lettere Building
 - University of Pretoria Art C

Places

- My Places
- Sightseeing
- Temporary Places

Layers

- View: Core
- Primary Database
 - Terrain
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University of Pretoria

UPSpace

UPSace at the University of Pretoria >
Special Collections >
African Heritage Digital Collection >
South African Architects, Buildings and Towns >
Gerard Moerdijk Collection >

Please use this identifier to cite or link to this item: <http://hdl.handle.net/2263/178>

Title: Merensky Library, University of Pretoria
Author/s: Unknown
Keywords: Merensky Library
University of Pretoria Library
Moerdijk, Gerard
Moerdijk, Gerard
Ou Merensky
Old Merensky

Issue Date: 23-Feb-2006
Abstract: Photos [1939] of the completed new library building, University of Pretoria, designed by South African architect, Gerard Moerdijk.
URI: <http://hdl.handle.net/2263/178>
Rights: Complies with rights as specified by Collection Administrator.
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Web / Library 2 international applications

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music

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The Devil wears Prada Cancel date: 08-18-2007

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War and peace [study guide] Tolstoy, Leo, graf, 1828-1910

Huckleberry Finn [study guide] Twain, Mark, 1835-1910

Weather Ann Arbor, MI 71°F

Today Sat Sun

Overcast Wind: N at 0 mph Humidity: 78%

82° | 63° 78° | 62° 78° | 65°

Top Stories

Ramsey family says arrest brings long-sought relief

NSA ordered to stop wiretap programme

Southem Lebanese greet national forces

Movies

Showtimes for 48103

Snakes on a Plane 1hr 46min - Rated R

Talladega Nights: The Ballad of Ricky Bobby 1hr 50min - Rated PG-13

Accepted 1hr 30min - Rated PG-13

Stockholm Library

Yäkkommen till Biblioteket.se - Biblioteket.se - Microsoft Internet Explorer

Biblioteket.se Stockholms stadsbibliotek

Sök Sök efter P2 webbläsaren

Alla Tidens Klassiker!

Virtual world (SL) & library

Welcome to Alliance Second Life Library Main!

What's inside: Reference, Meeting Room, Computer Lab, Displays, Anime/Manga, Genealogy, more to come!

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University of Pretoria



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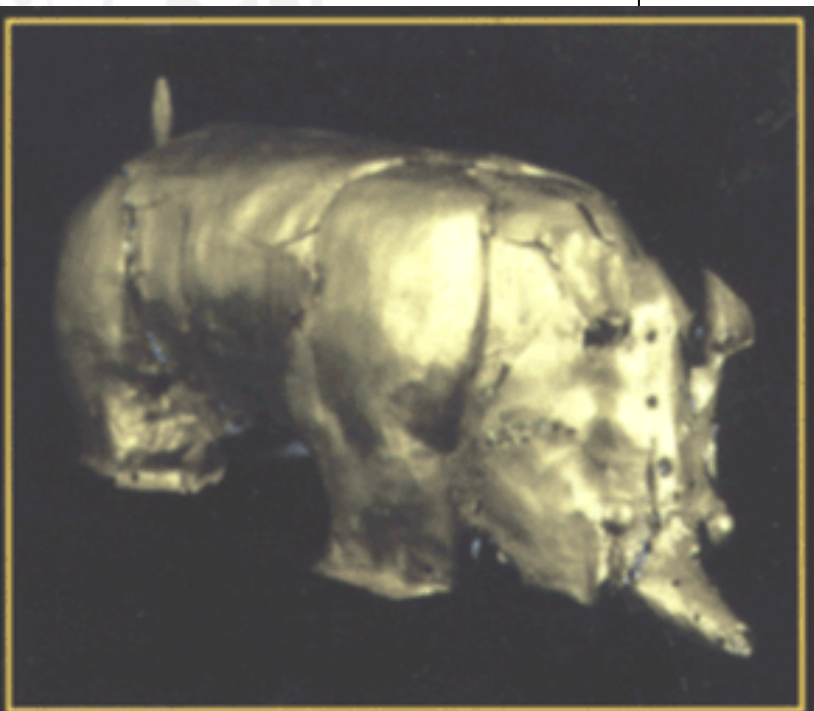
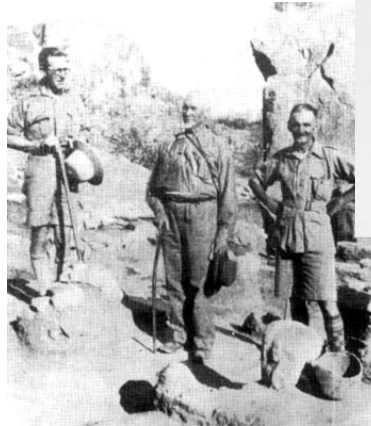
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Examples UPSpace Content



ence of high energy proton bor tical and defect properties of si

F D Auret¹, S A Goodman¹, M Huges², M J Legod
and D C Look²

¹ Physics Department, University of Pretoria, Pretoria 0002, South
Semiconductor Researchs Center, Wright State University, Dayton
Materials and Manufacturing Directorate, Air Force Research Lab

Received 6 June 2001
Published 20 September 2001
Online at stacks.iop.org/JPhysCM/13/8989

Abstract
We report on the electrical and defect characteristics
formed on single-crystal ZnO, before and after into
1.8 MeV) protons. Prior to bombardment we observe
traps (E1-E4), with energies between 0.10 and 0.57
band, are present in the ZnO. High-energy proton-
two electron traps (Epl and Ept2), with extremely low
of 2.4 and 1.9 cm⁻¹, respectively. Schottky barrier
reverse leakage current deteriorated from 1 × 10⁻⁸ A
to 1 × 10⁻⁶ A after bombarding it with a dose of 4
Compared to GaN we found that ZnO is remarkably
proton bombardment.

is semiconductor material with a high band gap, it
is. It finds application in phosphors, paints, piezoelectric
conducting films, the latter being important for
a recent review, where the properties of ZnO are
used for several other, more sophisticated, electronic
ZnO has an experimental direct band gap of 3.4 eV
blue and ultra-violet (UV) light emitting diodes, as
well as daylight-blind UV detectors, as is the case for solar
etc. The large band gap of ZnO renders it suitable for the fabrication of solar
and as a substrate or buffer layer for the group III nitride based devices. For
now, these devices often have to operate at elevated temperatures, typically
in harsh radiation conditions comprising energetic particles. Further practical

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The library offers a client-focused service to lecturers of the University of Pretoria. Please contact your information specialist with regard to any inquiries you may have.

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- Web/ Library 2.0 Tools**
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Governance

- **Deputy-director**: e-Information Strategy & e-Research Enablement is responsible for the strategy
- **e-Service unit** is responsible for the research, development, implementation & maintenance of e-products & services that support the strategy
- **e-Steering committees (matrix teams)** are responsible for co-ordination and development of their respective areas



e-Steering committees

- Library e-Service steering committee: Heila Pienaar
- e-Research steering committee: Heila Pienaar
- e-Learning steering committee: Ina Smith
- Digitisation steering committee: Ria Groenewald
- Open Scholarship steering committee: Monica Hammes
- Repositories steering committee: Ina Smith
- Library web steering committee: Monica Hammes
- Web / Library 2 steering committee: Heila Pienaar
- e-Resources steering committee: Soekie Swanepoel



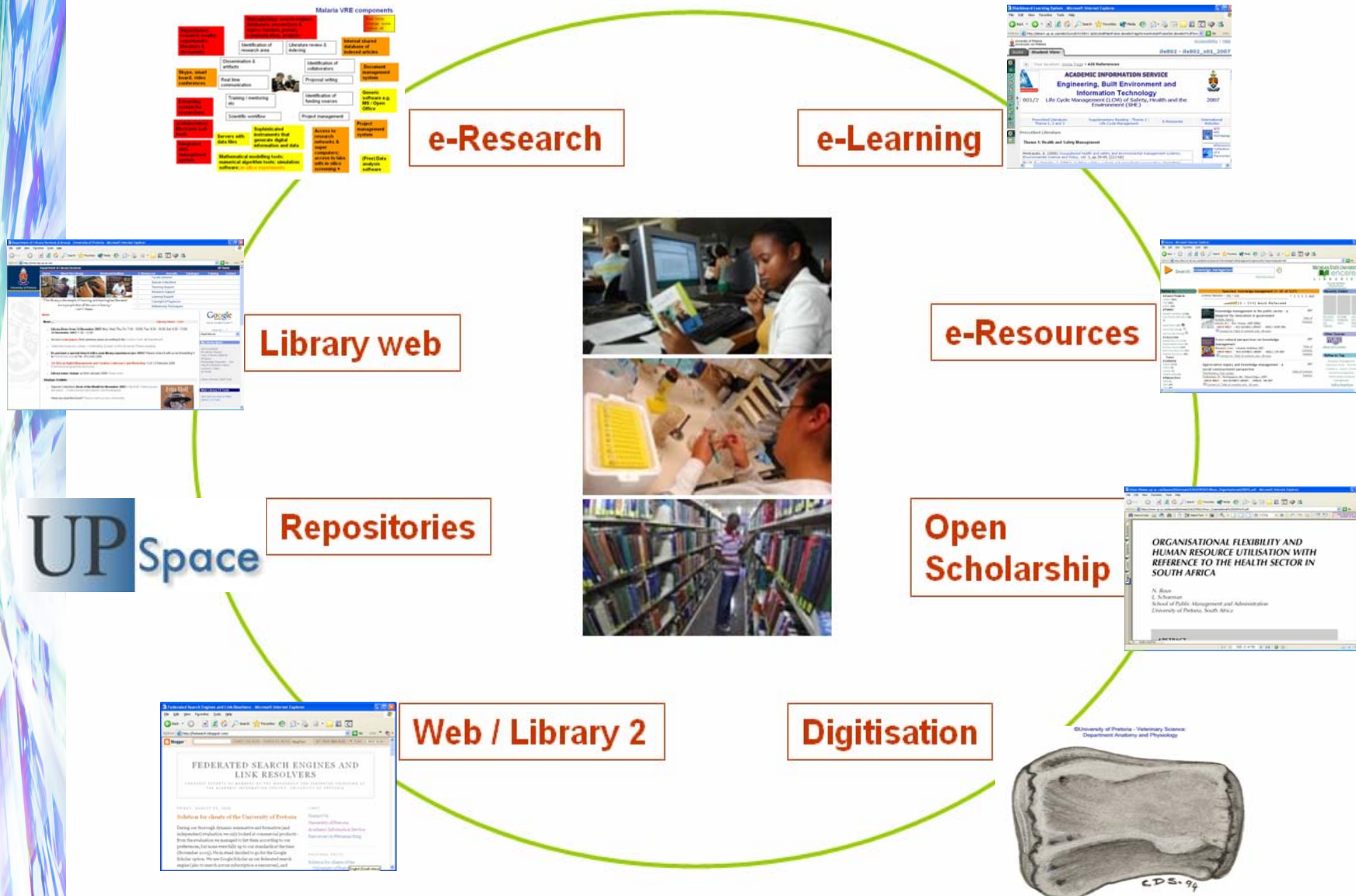
Roles & responsibilities of steering committees

- Chairs are responsible for the establishment of their steering committees
- Steering committees are responsible for their own strategic & implementation plans
- Steering committees to co-ordinate with one another
- Steering committees to discuss progress etc with the e-Service steering committee on a regular basis
- Steering committees are responsible for good communication and interfaces between line and project perspectives



In conclusion: we are moving in the right direction ...

e-Environment for Scholarship



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