Physical Science (Virtual) Research Spaces

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Talk

 Where do we do research?
 How and where do we find, access and interact with, research materials?
 How do we deposit research data (and what do we deposit)?
 The e-World
Smart Places & Things

We need Smart Labs and Smart Libraries
UCB Guidelines

- Precise campus standards for space utilization are elusive, due to the enormous variety and complexity of research space: but precision is not the point. What UC Berkeley requires is a simple and objective, but flexible, set of guidelines to ensure space is responsibly used and equitably distributed.

- Research space is a more complex problem. Changes over the past decade have no doubt been even more profound for research space than office space: but those changes are unique to each discipline, and to identify and characterize them would be a significant project in itself, on the scale of the original CPEC study.

- However, the original CPEC taxonomy remains valid in terms of the basic types of research space. While specific factors may need to be recalibrated, for example, to reflect the increased use of simulation rather than field experiments this may be done iteratively, as new program data become available from actual projects.
Specialized equipment may have specific infrastructure requirements
Write-up space adjacent to the laboratory

Some information needed in the lab
Virtual Organisation

- Virtual Research Collaborations
  - Much research is now global
  - Much research crosses academic industrial sectors
  - Concerns of how to find people
  - How to keep information flowing to keep the communities together
Wireless Technology

- Location independence? Is this always a good idea?

- Library material can be brought to all places but knowledge & experience about the information available is more difficult.

- Still have limitation on the speed, quantity and quality of access.
The changing face of annotation....

Information is provided in new ways, but ways that have the potential for much great automatic curation.

Research Students - are involved in learning
Undergraduates - involved in research
Staff - Continuing Education!
But what about the laboratory environment?

“I just realized, Howard, that everything in this apartment is more sophisticated than we are”
Physical Space

- Need equipment! Not possible in just any room
- Use more reconfigurable systems but services (water, power, extract) make this much more of a problem

The Network
- Very high density of connections
- Provides the ability to track people and functions
- Monitoring but less useful feedback as yet
Chemists escape labs via mobiles

By Jo Twist
BBC News science and technology reporter

A blend of mobile technology and award-winning software is letting scientists finally escape the lab.

The software, called "middleware", lets different computer systems talk to each other securely and instantaneously.

As part of a national e-Science project in the UK, it is being used to let Southampton University chemists monitor experiment conditions from mobiles.

Sensors in the lab pick up any changes in the environment so the system can alert chemists, wherever they are.

"It replaces the traditional notebook with some electronic recording," said Dr Bruce Rawlings from the University of Southampton.

Chemists enjoy a drink at the bar while keeping and eye on the lab.

IBM won the Royal Academy of Engineering's MacRobert prize which rewards technological and engineering innovation for the program in June last year.

Used by top global banks, the WebSphere MQ family is a decade old.

IBM's chemists are using mobile technology to escape the lab.
Increasing demand for access to information from remote places, even from home or the train.
Until 10 years ago my Chemistry Department had a library but space charges put an end to this.

Few people have personal paper copies of journals - no space to hold them, with pdf etc we can hold a personal copy on the computer.

The tea room is the ‘heart’ of the department - plans to create a more interdisciplinary equivalent for the Life Science Interface.

Social Space? Space for Discussions?
Scientists deposit and retrieve information from libraries

"User name and password?"
No! A library card won’t do.

But access is changing

The Laboratory and the Office have become our routine access to the Library……
Can I call you back? I’m looking up the journals in the library
Publication

- No longer so clear what this means
- So no longer clear what we expect to “find” in a library
- Speed of access may be an issue
Access to Information

- More e-journals
- Improved automatics linking of citations
- Does bias information to the more recent publications
- The web has done this anyway
- Version control & archiving of web pages
Need to make the data available

Need to be able to find it

But how to expose it?

First, they do an online search
He is charged with expressing contempt for meta-data
The Data!

- What is the issue here?
- The paper and the data (sets) are not the same thing
- Web removes space constraints (may be) and allows richer range of data resources to be disseminated publicly.
- Metadata, Attribution, Citation
Separating Data from Interpretations: A crystallography example

Structural investigations of phosphorus-nitrogen compounds. 4. Stric and electronic effects in dibenzylamino derivatives of hexa(hydroxycyclo)phosphazatrene and 4,4,5,5-tetrachloro-2,3-diphenylcyclohexaphosphazatrene

Intellect & Interpretation

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Underlying data
Access to **ALL** underlying data
Control of Access - not so simple in e-space

"On the Internet, nobody knows you're a dog."
Subversive and furtive sharing & exploitation of data in virtual space

Digital Repository

Data

PERPETRATOR OF A DARING DAYLIGHT ILLEGAL ELECTRONIC TRANSFER OF FUNDS FLEEING THE SCENE OF THE CRIME
“Knowledge Management”

- The importance of “Knowledge Management” is becoming more recognized
- Many disciplines are developing and “Informatics” arm.
- These have many aspects in common and need coordinating.
Recognition of Academic Output

- Citation of more varied information sources
- Repositories for “e-information” - not just papers, include the data
- Visibility of this information
- Curation and Archiving issues
Several groups making and analysing the library Administrative Domains transfer or share the data.
“Are we thinking here, or is this just so much pointing and clicking?”
All I am saying is that now is the time to develop the technology to deflect an asteroid.