Carnegie Mellon University

Building the library of the future

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What is happening in the world is bypassing university libraries

Peter Murray-Rust
The scientist's view
JISC Libraries of the future debate, April 2009
TODAY’s WORLD
CHAPTER ONE
A Secret Origin Story

Eisman entered finance about the time I exited it. He'd grown up in New York City, gone to yeshiva schools, graduated from the University of Pennsylvania magna cum laude, and then with honors from Harvard Law School. In 1991 he was a thirty-year-old corporate lawyer wondering why he ever thought he'd enjoy being a lawyer. "I hated it," he says. "I hated being a lawyer. My parents worked as brokers at Oppenheimer securities. They managed to finagle me a job. It's not pretty but that's what happened."

Oppenheimer was among the last of the old-fashioned Wall Street partnerships and survived on the scraps left behind by Goldman Sachs and Morgan Stanley. It felt less like a corporation than a family business. Lillian and Elliot Eisman had been giving financial advice to individual investors on behalf of Oppenheimer since the early 1960s. (Lillian had created their brokerage business inside of
3604. BOCCIA, DONATO. La reactie hemolitica d'Amato en la nikkia. [The hemolytic reaction of Amato in a monkey.] Rev. Mat.-Med. Endocrin. Nutr. y Quimioter. 12 (50): 679-687. 1929.-The Amato hemolytic reaction was found to be non-specific in 17 non-epileptic persons where 25 per cent. of reactions and in 21 epileptic. 6.5% negative. Znanny.

3605. BRENN, R., and F. SCHIFF. Zur Entstehung der Shiga-Kruse-Bazillen und seiner heterogenen Antigene. Deutsche Med. Wchnschr. 56 (20): 1508-1511. 1930.-29 cultures of Shiga-Kruse bacilli were obtained for presence of heterogenic antigen for Shiga-Kruse antigene; 24 gave an intense specific hemolysis, showing that they contained the heterogenic antigen; 5 gave negative results, and 97 other bacterial cultures, including pathogenic and non-pathogenic bacteria and molds. Presence of the antigen seems to be a specific characteristic of the Shiga-Kruse organism. 9 of the positive cultures gave results suggestive of Aebler's reaction after hydrolysis of the 5 negative cultures gave no such reduction. There was no specific carbohydrate difference between positive and negative cultures. They also showed that the negative cases were not more sensitive to other autolysis, and that the findings should be considered with some caution. (both major and minor) may be quantitative differences in their growth, but such differences do not seem to play any role in the reaction.

3606. BRUNK, L., and ALAN C. WOODS. The isolation and extraction of histidine. J. Biol. Chem. 91: 641-654. 1930.-Histidine was isolated and extracted by a combination of an acidic aqueous solution and a neutral or alkaline aqueous solution. The extract was then subjected to a pH gradient, and the histidine was precipitated at a pH of 6.5. The precipitate was then dissolved in a neutral solution and the histidine was purified by reprecipitation.

3607. CANNON, PAUL E., L. C. L. MILLER, and E. H. STRICKLAND. Conditions influencing the appearance of living bacteria from the blood. J. Exp. Med. 55 (3): 121-127. 2 pl. 1932.-Bacteria were removed from the blood by plasmapheresis and normal rabbits. The bacteria could not be found. Contact with heparin was insufficient and unimportant. The discovery of cases of undulant fever was made through use of the agglutination test. The presence of this test, however, indicates that very few positives will be found from tests with sera submitted for serological tests for syphilis in the ordinary course of medical practice. On the other hand, valuable and often decisive information will be obtained from routine agglutination tests with sera of patients suffering from obscure and periodic symptoms, such as rheumatic, intestinal, and abdominal disorders, as well as from suspected tuberculous and typhoid fever. -S. Bayes.
W(h)ither the Library?

Local distribution 1990s

Global digital 2000s

Cloud-based models 2010s

Convergent media services

Adapted from Redefining the Academic Library (Advisory Board Co (2011))
Percent of respondents agreeing strongly with each statement, over time.

Because faculty have easy access to academic content online, the role librarians play at this institution is becoming much less important.

- 2006
- 2009
- 2012

Because scholarly material is available electronically, colleges and universities should redirect the money spent on library buildings and staff to other needs.

- 2006
- 2009
- 2012

Faculty study 2012: key insights for libraries and publishers, Ithaka
Where do library clients go?

Where do student start a search?

- Search engine: 83
- Wikipedia: 7
- SNS: 2
- Email: 1
- Online database: 1
- Virtual reference: 0
- Library website: 0

Where do academics begin research?

- Specific e-resource: 37
- General search engine: 38
- Library catalogue: 28
- Library building: 13

Perceptions of libraries 2010, OCLC

Faculty study 2012: key insights for libraries and publishers, Ithaka
Students crowd libraries - without using libraries
Researchers and discovery services
Behaviour, perceptions and needs

A study commissioned by the Research Information Network

November 2006

“…contact with librarians and information professionals is rare”

“…researchers are generally confident in their [self-taught] abilities.., librarians see them as..relatively unsophisticated”

“…librarians see it as a problem that they are not reaching all researchers with formal training, whereas most researchers don’t think they need it”
The success of e-journals has driven the researcher from the library.
Open access is shaping policy agenda
Open Science will change everything
Growth of web-based knowledge and research tools - often outside the institution
Library budgets under pressure
Paradox 1

We love digital but we are still attached, at least emotionally and sentimentally, to print.
Paradox 2

We are all web residents but there’s nothing like face to face
Today’s students are technology savvy but not digitally literate

Paradox 3
Paradox 4

We are all pursuing openness - open access, open source, open content. But what about my rights? How are they going to be protected? Who will pay for open?
Paradox 5

Google Bastards
The Bastards of Search

The Fate of Search is at Hand

It's up to a Team of Search Professionals and a lot of Caffeine to Save the Net from...
The transformed library of the future will be at the core of teaching, learning and scholarship

- partnering with academic departments to create learning activities and environments
- helping to build an infrastructure for learning
- creating an intellectual commons for the community

Guskin, Project on the Future of Higher Education
Our Library Ecosystem is Under Threat

DISTURBING TREND ELIMINATING LIBRARY RESOURCES

In a study released Wednesday, Pew reports that an overwhelming majority of Americans value libraries. Ninety-five percent of Americans 16 and older say that libraries are important because of the opportunities and resources they provide, and because they contribute to society. Some 50% of Americans ages 16 and older said that the closing of their local public library would have a major impact on their community, with 63% saying it would have a "major" impact. Asked about the personal impact of a public library closure, 30% of Americans said they would suffer.

http://mystory.gale.com/watch/
WHERE HAVE WE COME FROM?
Collection-centric - 1st generation
Client-focused - 2nd generation
Experience-centered - 3rd generation
Connected Learning Experiences - 4th generation
Collaborative knowledge, media and fabrication facilities - 5th generation

- **Serial Expenditures**: +402%
- **Library Materials**: +302%
- **Total Expenditures**: +188%
- **Total Salaries**: +153%
- **Operating Expenditures**: +128%
- **CPI**: +106%
- **Monograph Expenditures**: +71%

% Change Since 1986

Library Expenditure as % of Total University Expenditure (Average of 40 US Institutions Reporting Since 1982)
Two sides of the argument

Librarians complain about pricing

- Price increases greater than budget uplift
- Big deals limit ability to cancel titles
- Books are sacrificed for journals
- Costs would be lower in a not-for-profit model
- ‘Our academics did the work - why should we pay (so much)?’

 Publishers point to explosion in output and value they add

- Great increase in number of articles
- Cost per download decreasing
- Big deals offer wider access at discount
- e-journal transition required massive investment
- ‘We will try open access if we can cover costs’

Support open access

Find new sources of funds
SCHOLARLY COMMUNICATION
An Impacts Framework

**RESEARCH**
Access for all, research participation based on merit, not means.

*Potential benefits:*
- Speeding up discovery.
- Reduction of duplicative research.
- Fewer blind alleys.
- New research possibilities.
- Better educational outcomes & enhanced research capabilities.

**SOCIETY**
Access as needed, informed consumers (e.g. health and education).

*Potential benefits:*
- Contribution to the 'informed citizen' and 'informed consumer', with implications for better use of health and education services, better consumption choices, etc.
- Leading to greater welfare benefits, which in turn may lead to productivity improvements.

**INDUSTRY**
(1) Access as needed, more informed producers & policy.
(2) New businesses add value to content (e.g. Weather Derivatives).

*Potential benefits:*
- Accelerate and widen opportunities for collaboration, commercialisation & adoption.
- The potential for much wider access for GPs/nurses, teachers/students, and small firms in consulting, engineering, ICT, nanotechnology, biotechnology, etc.
- The potential for the emergence of new industries based upon the open access content.
RCUK announces block grants for universities to aid drives to open access to research outputs

<table>
<thead>
<tr>
<th></th>
<th>Year-1</th>
<th>Year-2</th>
<th>Year-3</th>
<th>Year-4</th>
<th>Year-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCUK APC fund</td>
<td>£17m</td>
<td>£20m</td>
<td>To be determined</td>
<td>To be determined</td>
<td>To be determined</td>
</tr>
<tr>
<td>Expected % of papers in Gold OA</td>
<td>45%</td>
<td>53%</td>
<td>60%</td>
<td>67%</td>
<td>75%</td>
</tr>
</tbody>
</table>
Compliance Cost of the RCUK Open Access Policy

A Snapshot of Costs to UK Research Organisations in 2013/14

- **£9.2 MILLION**
  - Other support and advocacy: £0.4m
  - Systems and software: £1.3m
  - Green route: £0.1m
  - Gold route: £0.8m
  - Overheads: £2.2m
  - Academic managers: £1.2m
  - Administrators: £3.2m

[Research Consulting](www.researchconsulting.co.uk)

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“The Holdren Memo”

To achieve the Administration’s commitment to increase access to federally funded published research and digital scientific data, Federal agencies investing in research and development must have clear and coordinated policies for increasing such access.

Memo on Increasing Access to the Results of Federally Funded Scientific Research
White House Office of Science and Technology Policy
February 22, 2013
In the print library

- Local access costs low - saved time allowed for research productivity
- Library costs high - acquisitions, maintenance, curation, buildings
- Correspondence between library reputation and research quality
- Great libraries attracted great scholars
- Great scholars attracted great funding
• Technology reduces costs of production and distribution - big deal
• Demand from academy is chiefly for online content
• Almost all new content born digital
• Large swathe of scholarly print material now digitised - books and journals
What might this mean?

• Ongoing acquisitions will require increasingly less space
• Substantial parts of existing collections can be relocated off-site and replaced with digital versions
• Tremendous growth in access to older materials not previously available locally
• As services like Google books mature these trends will accelerate (subject to statutory provisions)
• This will provide new space opportunities for universities and their libraries
Libraries can cease collecting print versions

Faculty study 2012: key insights for libraries and publishers, Ithaka
Today: tradition unsustainable, digital not quite ready

Migration issues

Books: e-books and PDA more ‘messy’ than expected
Journals: price concerns - looking for alternatives to big deal?
Space: library buildings full of legacy collections
Staff: Library staff tied up in traditional services with declining demand and impact
Researchers: Embracing digital scholarship (open science, digital humanities, data mgmt) - looking for professional assistance
The ‘owned’ collection

The ‘facilitated’ collection

The ‘borrowed’ collection

The ‘demand-driven’ collection

The ‘licensed’ collection

The ‘shared print’ collection

- Purchased and physically stored

- Pointing people at Google Scholar
- Including freely available e-books in the catalog
- Creating resource guides for web resources

Figure: A collections spectrum. OCLC Research, 2015.
Traditional usage declining
Changes in media access
New competitors
Changing user demands and IT
Financial challenges
WHERE ARE WE GOING?
Current directions in academic libraries - building the library of the future

1. Continue the migration from print to electronic and realign service operations
2. Review location of lesser-used collections
3. Continue to repurpose library as primary learning space
4. Reposition library expertise and resources to be more closely embedded in research and teaching enterprise outside library
5. Extend focus of collection development from external purchase to local curation
LEARNING SPACE
Case study 1
UQ - use of space
Focus group themes

• Opening foci
  - What are we doing well?
  - What could we do better?
  - What more could we do to support you in your studies?

• Your assignment story
  - Where did you work? With whom? What information did you gather? Where did it come from? What technology did you use? From whom did you seek advice?
Information Seeking Behaviour of First Year Students
A research study
Log Book

Programme: ..........................................................................................

Course: ..............................................................................................

Assignment topic
..........................................................................................

..............................................................................................

..............................................................................................

Length: .................................................................

Due Date: .................................................................

Date work on assignment commenced: .................................

For each day, please record the following:

• Persons consulted: (categories, not names; eg friend, tutor)
• Places where you worked: eg library – (please give branch and space – group or quiet or room); home; collaborative learning centre; coffee shop; on the train; etc
• Activities undertaken: See list below (not exclusive – add anything else you need to)
• Time spent in each activity

Types of activity:

• Attend Library information class
• Begin writing
• Course reading lists
• Draft essay
• Identify key concepts
• Look at Assignment Planner
• Note taking
• Reading from articles
• Reading from books
• Recording references
• Searching databases
• Searching internet (how and what)
• Searching Library catalogue (How – title, keyword, subject. Using what terms)
• Subject guides
• Talk to librarian
• Talk to others in course
• Talk to parent/other
• Talk to tutor
• Topic analysis
• Visit Library other than UQ

Example:

| Monday          | Home: Reviewed assignment topics and decided which one to do – 30 mins
| Home: Analysed topic for main concepts, listed key words – 15 mins. |
| Uni – rec.      | Discussed topic with tutorial group students – 10 mins. |
| SS&H Library, Level 1: searched catalogue, recorded book titles and call numbers - 40 mins |
Win an Apple iPod Touch

What would your ideal Library look like?

Join in a design workshop with other students to be in the draw to win an iPod Touch. Open to all students. All you need to do is bring your ideas!

When  Tuesday, 19 August 2008, 12 – 2 PM
Where  Room 241 Collaborative Teaching & Learning Centre,  
       Sir James Foote Building (Bldg 47A)

       A FREE LUNCH WILL BE PROVIDED

Name: __________________________________________________________

Email: s___________________________@student.uq.edu.au

There is a maximum of forty places available. Student entries will be drawn at random. Students whose entry is selected will be notified by email by 15 August.

The workshop will be facilitated by Hamilton Wilson of Wilson Architects.
OUTSIDE AREA
- Bean bags/comfortable chairs
- Quiet but not silent
- Reading

* Natural light
* PLANTS

FISH TANK

* Lockers
- Single access [FREE]
* Possibly online access to tests (i.e., main network) and spa
* Isolated rooms
* Online forums for all courses
* Computer

* Glass doors
* BIG desk
* Hifi (shelf)
* Power points
* Drapes
group space

- adjustable height chairs and desks (sleeping friendly)
- different lighting option e.g. lamp

- size of groups - 4-6
- lecturer sets - can’t pick group members

food + water refill station
Private wall

breakable table

printer scanner

sound proofing
private room
- Retractable shades
- Whiteboard... (in built printer) (maybe portable)
- Table with powerpoints (at least 4)
- Comfy chairs / height adjustment

- Study rooms
  - Plasma screens
  - Projector screen
- Good to have natural lighting

- Spacious rooms
  - Sound proof
  - Transparent

Strip of translucent glass (privacy)

Group size: Max 8

- Light adjusters
- Voice recorder (stuff to simulate real presentation environment)
- Printer
- Telephone
Key themes

Reliable and wide-spread access to the Internet
A range of technology to support group work including voice recorders, smart boards and printers
A steady supply of drinking water and coffee and adequate natural light
Services that provide convenience are valued and we are looking to implement website features that should help satisfy demands for simpler ways to find material in the Library.
The students at the workshop affirmed that place is important to them: they like to come to the Library.
Student demands of our spaces can change during the academic year according to course progression and the nature of assessment tasks, so flexibility is an important design consideration
My time at UQ Library

How can we make it better?

The Library is conducting some research about how and why our students* use the Library. We are very interested to know what you do so that we can plan for future services and facilities.

Please help us help you and complete this questionnaire during your visit today.

And just for doing this, you will be eligible to enter the draw for an Apple iPod Touch.

Thank you for your time.

* Survey for UQ Students only
Activities

1. What have you come to the Library to do today? (tick as many as you like)
   - Use Library computer/laptop
   - Quiet study
   - Group work
   - Find/borrow books
   - Find journal articles
   - Attend a training session
   - Use printer/copier
   - Use my own laptop
   - Work on individual assignment
   - Meet friends
   - High Use
   - Find course materials
   - Get IT help
   - Get research help
   - Coffee
   - Other (please specify)

2. Why did you come to the Library to do this?
   - It is the only place to find what I need (above)
   - My friends come
   - My group is meeting
   - Good study atmosphere
   - Good study/work environment
   - Convenient location
   - Nowhere else open
   - Other (please comment)

3. Where were you before you came to the Library? (e.g. lecture, Red Room, home)

4. How long do you plan to stay here this visit?
   - Quick visit (< 30 minutes)
   - 30 minutes - 2 hours
   - Long visit (> 2 hours)

5. Where in the Library do you plan to work?
   - Level 1
   - Level 2
   - Level 3
   - Level 4
   - Level 5
   - Wherever I can find a computer
   - Wherever I can find a free space

6. Is your only visit to this branch today? [ ] Yes [ ] No

7. How often do you usually visit this branch (in person)?
   - Daily
   - Weekly
   - Monthly
   - Not often

8. How often do you usually visit any UQ library branch (in person)?
   - Daily
   - Weekly
   - Monthly
   - Not often

9. How often do you usually visit other non-UQ libraries (in person)?
   - Daily
   - Weekly
   - Monthly
   - Not often

10. Do you spend as much time as you had intended on this visit? [ ] Yes [ ] No, more [ ] No, less

11. If no, why?

12. Time of exit: [ ] AM [ ] PM

Thank you for your time. Please put this form in the SURVEY BOX as you leave the Library. If you want to go in the draw for an Apple iPad Touch, please fill in the enclosed form and put it in the ENTRY BOX near the front gate.

Achievements

Intentions

Activities
<table>
<thead>
<tr>
<th>Number</th>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Got questionnaire</td>
<td>1 min</td>
</tr>
<tr>
<td>2</td>
<td>Borrowed laptop</td>
<td>4 mins</td>
</tr>
<tr>
<td>3</td>
<td>Checked for space</td>
<td>1 min</td>
</tr>
<tr>
<td>4</td>
<td>Check for suitable place for laptop</td>
<td>3 mins</td>
</tr>
<tr>
<td>5</td>
<td>Found a place to study</td>
<td>2 mins</td>
</tr>
<tr>
<td>6</td>
<td>Work on assignment</td>
<td>2 hrs</td>
</tr>
<tr>
<td>7</td>
<td>Toilet</td>
<td>7 mins</td>
</tr>
<tr>
<td>8</td>
<td>Vending machine - buy DVD</td>
<td>5 mins</td>
</tr>
<tr>
<td>9</td>
<td>Burn DVD on laptop</td>
<td>10 mins</td>
</tr>
<tr>
<td>10</td>
<td>Exit</td>
<td>0</td>
</tr>
</tbody>
</table>
### Categories of activity

**Individual** - **Social** - **Library Staff**

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### Q1: What have you come to the Library to do today?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use computer/laptop</td>
<td>63.11%</td>
</tr>
<tr>
<td>2. Quiet study</td>
<td>53.88%</td>
</tr>
<tr>
<td>3. Find/borrow books</td>
<td>37.66%</td>
</tr>
<tr>
<td>4. Work on individual assignment</td>
<td>32.11%</td>
</tr>
<tr>
<td>5. Use printer/copier</td>
<td>28.94%</td>
</tr>
<tr>
<td>6. Find journal articles</td>
<td>18.99%</td>
</tr>
<tr>
<td>7. Group work</td>
<td>18.22%</td>
</tr>
<tr>
<td>8. Course materials</td>
<td>15.63%</td>
</tr>
<tr>
<td>9. Meet friends</td>
<td>15.05%</td>
</tr>
<tr>
<td>10. Use my own laptop</td>
<td>10.4%</td>
</tr>
<tr>
<td>11. High use collection</td>
<td>9.69%</td>
</tr>
<tr>
<td>12. Coffee</td>
<td>5.81%</td>
</tr>
<tr>
<td>13. Other</td>
<td>3.75%</td>
</tr>
<tr>
<td>14. Get research help</td>
<td>1.81%</td>
</tr>
<tr>
<td>15. Attend training session</td>
<td>1.61%</td>
</tr>
<tr>
<td>16. Get IT help</td>
<td>1.55%</td>
</tr>
</tbody>
</table>

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### Exit Q1: What did you ACTUALLY do during this visit?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use Library computer/laptop</td>
<td>62.4%</td>
</tr>
<tr>
<td>2. Quiet Study</td>
<td>47.93%</td>
</tr>
<tr>
<td>3. Find/borrow books</td>
<td>29.91%</td>
</tr>
<tr>
<td>4. Work on individual assignment</td>
<td>24.68%</td>
</tr>
<tr>
<td>5. Use a printer/copier</td>
<td>24.03%</td>
</tr>
<tr>
<td>6. Meet friends</td>
<td>16.34%</td>
</tr>
<tr>
<td>7. Group Work</td>
<td>13.24%</td>
</tr>
<tr>
<td>8. Find journal articles</td>
<td>13.24%</td>
</tr>
<tr>
<td>9. Find course materials</td>
<td>10.85%</td>
</tr>
<tr>
<td>10. Use my own laptop</td>
<td>7.43%</td>
</tr>
<tr>
<td>11. High use collection</td>
<td>5.81%</td>
</tr>
<tr>
<td>12. Other</td>
<td>4.52%</td>
</tr>
<tr>
<td>13. Get IT help</td>
<td>1.36%</td>
</tr>
<tr>
<td>14. Get research help</td>
<td>1.29%</td>
</tr>
<tr>
<td>15. Attend a training session</td>
<td>0.52%</td>
</tr>
<tr>
<td>16. Coffee</td>
<td>0.26%</td>
</tr>
</tbody>
</table>
Key lessons/ideas

Student use of the Libraries is very intentional and focussed.

- They spend their time between lectures in the Library, they know what they want to do, and they do it
- They call in to the Library when they first arrive, or before they go home
- They come with the intention of putting in a good few hours’ solid work

Students spend long periods in the Libraries. They appreciate comfort, and also an aesthetically pleasing environment, as well as one providing an appropriate study atmosphere.

The prime causes of frustration and irritation in our Libraries are around computer access and noise levels.

- People wanting to do quiet study are very annoyed by chatter, phones, iPods
- People want to do group work are very annoyed when one individual has taken up a whole table (note design workshop students said they liked to spread out and wanted to work, individually, at large tables)
- Both groups expect Library staff to police the other group

Maximising facilities for computer use (both in group contexts and individually) is paramount. They want provision for eating/drinking without having to leave the Library and risk losing their place.
Please don't allow the anti-academics amongst your management to allow our libraries to be turned into playgrounds. Playgrounds are available everywhere to those that want them. If you drive those of us who want real libraries out, where can we go? (Plus, remember: the current fashion will pass, fly-by-night management will move on to the next fashion as always).
3.0 **Space Requirements**

3.1 **Introduction**

This Brief provides some guidance as to the broad spatial planning requirements. Details of the spaces required need to be reviewed through a discussion involving all parties. Emphasis will be on flexibility.

3.2 **Required Spaces**

- Entrance
- Information/Loans Service
- Reading Area
- eZones/Education Space
- Reading/study areas
- Group/Study Cluster Rooms
- Pharmacy Population in 2010
- Print Collection
- Printing/Document Production
- Staff Areas
- Returns area

3.3 **Broad space descriptions are provided below:**

**Entrance**

- Combined entrance/exit
- Entrance should be clearly identifiable in the building context
- Customer assistance clearly visible
- Large welcoming space for orientation
- Multi corridor security gate for theft detection (at least 1.5 metres from any constructional metal and/or computer terminals)
- 2 stand-up information computers for quick access
- Internal courtesy phone
- Informal area and gathering space
- Large plasma screen
- Chilled water fountain
- After hours returns location (in PACE building)

**Information/Loans Service**

- Service point for loans checkout, information enquiries and returns
- Adjacent to exit/entrance
- Two computer workstations at loans service point with two docket printers. One of these computers on low desk for wheelchair enquiries or for long enquiries - desk with no front for wheel-under
- Duress alarm
- Shelving for holds on open access
- Network printers, change machine, and card dispenser in this vicinity
- Easy access to staff copier/printer
- Auto loan service close enough for staff intervention
- In-desk desensitisers to deactivate security
- Telephones
- Interview area between staff member / user (perhaps in semi enclosed space)

**Reading Area**

- Low display shelving for recently received books and journals (single bay)
- Comfortable seating for 10 – 15
- Quiet area with pleasant outlook

**eZones/Education Space**

- 1 training room with 24 workstations. Room needs to be able to divide into 2 areas to accommodate 11 students and 1 trainer in each room.
- 2 data projectors, projection screens (or plasma), whiteboards
- Lectern/desk in each space
- Storage facilities
- Blackout blinds
- Dimmable lighting with overhead lighting appropriate for screen-based work
- Telephone

**Group/Study Rooms**

- 3 group rooms each to accommodate 6 people (all with viewing facilities, network access, plasma screens and white board walls)
Case study 2
CMU - IDeATe
21st Century Complexity - Great Global Challenges
Requires collocated teams of diverse experts
and experiential inquiry – collaborative making
Collaborative Learning Through Making - a key characteristic of the residential experience

Learning from faculty and diverse peer cohorts
Carnegie Mellon is the only U.S. University with

• top-ten ranked units in computer science, engineering, the arts and design

• distinguished record in collaborative technology-arts efforts (from HCII to the ETC and Traffic 21).

• top ten ranked units in business and computational social sciences
CMU as THE Destination for New Creative Industries
Education and Research
Diagram 01: Integrative Design, Arts and Technology Undergraduate Concentrations

- Concentration or Minor
- Portal course for arts/humanities students
- Portal course for engineering/science students

Concentration Students Take: 1 + 2 + 1

1 Portal Course
2 Concentration Area Courses
1 Other Concentration Area Course
Eight Undergraduate Concentrations
IDEATE@Hunt

• Contains:
  • a digital fabrication shop
  • a physical computing lab
  • an interactive media black box
  • traditional fabrication facilities
  • and collaborative design studios that also serve as classrooms

• learning through making key part of the residential experience at CMU
• evolution of the library into a mediated learning commons
The role of librarians

**Current state**

Many libraries retain large numbers of librarians to catalogue and count.

Even more librarians wait at service desks ‘just in case’.

Few librarians leave the library building.

**Future state**

Librarians embedded in research and teaching activities.

Librarians become campus specialists in areas such as e-science, academic technology and research evaluation.

Librarians have meaningful impact.

**Current barriers**

Many librarians lack skills and useful qualifications.

Many librarians are resistant to change.

Academics do not believe librarians are useful or credible partners.
Never underestimate the importance of a librarian.

Okay, chances are you won’t actually find a librarian in the operating room. But librarians do play a vital role on any surgical team enabling research breakthroughs and point-of-care solutions. Whether you’re choosing information for specific research communities or decision-support for professionals, Elsevier offers access to a world of information that knows no boundaries. Select from a wide range of scientific, technical and health information available in multiple media, including innovative electronic products like ScienceDirect® and MD Consult. After all, getting the right information into the right hands is critical to the success of any operation. BUILDING INSIGHTS, BREAKING BOUNDARIES.”
Overview:
The assessment framework

<table>
<thead>
<tr>
<th>Overall quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs</td>
</tr>
<tr>
<td>Impact</td>
</tr>
<tr>
<td>Environment</td>
</tr>
</tbody>
</table>

- Maximum of 4 outputs per researcher: 65%
- Impact template and case studies: 20%
- Environment data and template: 15%

Standard Evaluation Protocol
2015 – 2021

Protocol for Research Assessments in the Netherlands
ERA uses a number of bibliometric tools for the citation analysis indicators. Two broad types of citation analysis are used in ERA: Relative Citation Impact (RCI) and the distribution of publications based on comparisons with field-specific benchmarks.

REF will assess universities on the basis of the quality of research outputs, the vitality of the research environment and the wider impact of research.
Metrics, commonly referred to as bibliometrics, includes basic measures such as numbers of publications and the citation counts to them. As a broader topic, it can include the h-index, journal quality metrics like the Impact Factor, collaboration metrics and citation impact measures.

Metrics are discipline-specific and they vary over time. It is therefore important that they are used in context, taking into account the discipline and timeframe under consideration.

- San Francisco Declaration on Research Assessment (DORA)
  In December 2012, the San Francisco Declaration on Research Assessment (DORA) was initiated by the American Society for Cell Biology together with a group of editors and publishers of scholarly journals in recognition of the need to improve the ways in which some metrics are used in research evaluation.

### Metrics for grant writing and promotion

- Need some information about what sort of metrics you should use in a research grant application?
- Want to know how to support claims of research excellence, significance and impact?
- Would you like to provide information about the extent of your research collaborations?

Look at Grant Writing: Using Metrics to your Advantage for information about the various metrics available to you to support claims of research excellence, significance and impact, as well as how to demonstrate your collaboration extent. You will need to login to UQSpace to access the file.

See also the presentation “The dos and don’ts in individual level bibliometrics” by Paul Wouters and Wolfgang Glänzel, presented at the 14th International Society for Informetrics and Scientometrics Conference in Vienna in July 2013.

### What is a citation count?

A citation count is the number of times a research work such as a journal article is cited by other works. It is considered (by some) to indicate the quality of the work, the assumption being that a higher number of citations indicates a higher quality (and vice versa).
Training & Education

CWTS offers a range of courses on using bibliometric analyses for research management and research evaluation. Courses are regularly held in Leiden and we are also pleased to organize tailor-made on-site training courses. This training provides users of bibliometric analyses with the knowledge and skills they need to interpret bibliometric statistics properly and usefully.

CWTS Course 'Measuring Science and Research Performance'

This course is for everyone who wants to build a solid and comprehensive foundation in bibliometrics and research evaluation. This popular course was established ten years ago and is given by highly experienced scientists who have in-depth and up-to-date knowledge of all the latest developments in the field. The course provides a solid understanding of the role played by quantitative analyses in research evaluation. The core of the course is devoted to bibliometric analysis approaches and examines their rationales, methodology and limitations. The programme offers both lectures and hands-on interactive modules.

» Read more

Advanced Citation Analysis

The Advanced Citation Analysis course deals with all ins and outs of professional citation analysis and its use in research assessment contexts. The course can be seen as a follow up on
### Institutions collaborating with Carnegie Mellon University

<table>
<thead>
<tr>
<th>Institution</th>
<th>Co-authored publications</th>
<th>Co-authors at Carnegie Mellon University</th>
<th>Co-authors at the other institution</th>
<th>Field-Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel</td>
<td>180</td>
<td>217</td>
<td>84</td>
<td>4.03</td>
</tr>
<tr>
<td>Microsoft USA</td>
<td>179</td>
<td>160</td>
<td>178</td>
<td>3.36</td>
</tr>
<tr>
<td>IBM</td>
<td>143</td>
<td>107</td>
<td>135</td>
<td>2.17</td>
</tr>
<tr>
<td>Google Inc.</td>
<td>87</td>
<td>112</td>
<td>94</td>
<td>3.21</td>
</tr>
<tr>
<td>IBM Research</td>
<td>42</td>
<td>47</td>
<td>55</td>
<td>1.43</td>
</tr>
<tr>
<td>Microsoft Research Asia</td>
<td>41</td>
<td>58</td>
<td>51</td>
<td>3.22</td>
</tr>
<tr>
<td>General Motors</td>
<td>29</td>
<td>37</td>
<td>15</td>
<td>4.07</td>
</tr>
</tbody>
</table>

DC #1
Koedinger K.R.; Cranor L.F.; Faloutsos C. Models; Algorithms; Experiments.
The University of California is one of the leading academic research enterprises in the world. UC research has contributed to California’s emergence as the intellectual and economic power that it is today. Almost all of the industries in which California is a world leader – biotechnology, telecommunications, digital media, computers and semiconductors, and environmental technologies – grew out of university-based research.

- UC research produced 1,581 new inventions – an average of four a day – in 2011 alone.
- UC develops more patents than any other university in the nation. It holds 3,900 active U.S. patents, many of which have led to creation of today’s leading industries.
- More than 600 startup companies have been formed with UC inventions; 58 in 2011 alone.

UC Technology Transfer Annual Report, 2011

UC investigators received $4.4 billion in research funding in the 2011-12 fiscal year.

- For every $1 in research funding provided by the state of California, UC secures $7 more in federal and private dollars.
- Nearly 75 percent of UC’s research funding comes from federal agencies and private sources, with approximately 50 percent from federal funds.
- UC is a leader among universities receiving research awards from the National Institutes of Health and the National Science Foundation. Other federal agencies that figure prominently in UC’s research awards are the National Science Foundation, Department of Defense, National Aeronautics and Space Administration, and Department of Energy.
- State funds accounted for about 11 percent of UC’s research expenditures in 2011-12.
HOW WAS YOUR SPRING BREAK?

GOOD. I GOT A GRANT APPLICATION FINISHED, A BOOK REVIEW DONE, THREE PAPERS SUBMITTED AND AN EXAM PUT TOGETHER. HOW ABOUT YOU?

GOOD. I WENT SKIING IN COLORADO.
101 Innovative tools and sites in 6 research workflow phases
(<2000 - 2015)
Traditional workflow

All of these tools licensed by institution
Open Science

discovery → analysis → writing → publication → outreach → assessment

Paperity → ROpenSci Exchange Zooniverse → Hypothes.is Google Drive Zotero → F1000Res PLoSOne Figshare Dryad → ORCID Research Gate SlideShare → Publons + ImpactStory

All of these tools accessible by researcher
Size doesn’t matter any more

Traditional library metrics

- Number of volumes
- Number of serials subscriptions
- Reference requests
- Gate count
- Number of issues
- Anything else that moves and is easy to count

Evolving library metrics

- Impact on student recruitment and retention
- Impact on student learning outcomes
- Contribution to research excellence
- Impact on broader economic, social and health outcomes
- Return on investment
## Making a difference

<table>
<thead>
<tr>
<th>Adverse event avoided</th>
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</tr>
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<tbody>
<tr>
<td>Hospital admission</td>
<td>11.5</td>
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<tr>
<td>Hospital acquired infection</td>
<td>8.2</td>
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<td>Surgery</td>
<td>21.2</td>
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<td>Additional tests/procedures</td>
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*Marshall (1994) The impact of information services on decision making*
## Making a difference

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<tr>
<td>Patient mortality</td>
<td>19.2</td>
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Marshall (1994) The impact of information services on decision making
The need to understand

• Dubious about some studies which make claims about the value of libraries

• Commissioned a study to assess the value library-provided information resources deliver to their research communities
Summary finding

• The final scenario would result in total costs to the institution of $81.4m compared to actual spend of $34.5m - a financial return of 136 percent
The UOW Library Cube

library resources + student use = value
The graph shows the relationship between "Hours spent accessing electronic resources" and "Student marks". A regression line is fitted to the data, which can be described by the equation:

\[ y = 3.9155 \ln(x) + 57.732 \]

with an \( R^2 \) value of 0.9075, indicating a strong correlation between the variables.
How do we add value?

- British Library adds £419m of value to the economy each year

http://www.bl.uk/aboutus/stratpolprog/increasingvalue/britishlibrary_economicvaluation.pdf
Carnegie Mellon University

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cmkeithw

Keith Webster