GIS and Data: Making Space @ MIT: Development of the MIT Libraries GIS and Data Lab

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GIS and Data: Making Space @ MIT

Development of the MIT Libraries GIS and Data Lab

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Introductions: DSS → GIS & DMS teams

Mikki S. Macdonald
DMS & SCCS

Joe Carrano
DMS & IASC

Ye Li
DMS & LIRS

Ece Turnator
DMS & LIRS

Phoebe Ayers
DMS & LIRS

Helen Bailey
DMS & DLS

Amy

Jennie

Madeline

Christine

Daniel

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Ye Li
DMS & LIRS

Mikki S. Macdonald
DMS & SCCS
Introductions: Data & Specialized Services
Plan for this session

- Understand the MIT context for GIS and RDM services
- Follow the development of the GIS and Data Lab space
  - Successes
  - Lessons
- Understand the space assessment goals and results
  - Successes
  - Lessons
- Explore future plans
GIS @ MIT Libraries

MIT Academic Computing hires GIS Specialist; Esri license

MIT Libraries hires GIS Specialist

Access to geospatial data collection through Arcgis

GIS @ MIT Libraries

Census data leads librarians to GIS & spatial data

GIS workshop given during IAP

GIS Lab & tech funded by Academic Computing

GIS Lab has six computers

Data Management Services @ MIT

1990s

1999

2000

2001

2002

2004

Data Services Reference Librarian began providing informal DM support
In the beginning,

MITdesignX is an academic program in the MIT School of Architecture and Planning (SA+P) dedicated to design innovation and entrepreneurship.
But then, things happened…
and it became

(Good thing, too, once we got into the space – you’ll see)
New goals!

"focused spaces for Learning, Community, and Creating"

- Co-locates DSS staff in GIS and Data Management services;
- Expands the current GIS lab to:
  - Accommodate additional users,
  - Enable experimentation with additional data services on lab computers, and
  - Improve instruction capabilities.
- Creates space for consultation and collaboration;
- Provides space to experiment with visualization and virtual reality technologies.
- Adapts to current and future needs of DSS and the MIT Libraries
- Increases access to expertise
The process

SMARTENS

Needs
- Services
- Power & data
- Floorplan & furniture
- Offices

Solutions

Refinement

Implementation

Assessment

Correction

Sustaining
Transition to a new GIS and Data Lab

Started with a floor plan in AutoCAD
Transition to a new GIS and Data Lab
The process

- Needs
  - Services
  - Power & data
  - Floorplan & furniture
  - Offices
- Solutions
- Refinement
- Implementation

Assessment → Correction → Sustaining
Money slide: Space takes money!

- Awesome things we did
  - Good compute power
  - Sustainable funding plan for tech
  - Experimental software
  - Great AV
  - VR equipment and area

- Creativity within restrictions
  - Electricity
    - Outlets
    - Lighting
  - Cubicles
  - Design
The process

**Needs**
- Services
- Power & data
- Floorplan & furniture
- Offices

**Solutions**

**Refinement**

**Implementation**
Final lab space configuration
Assessment framework: Goals

- Improve instruction capabilities (Learning)
- Create space for consultation and collaboration (Community)
- Create convenient access to expert help /Increase visibility & accessibility of DSS staff (Community & Learning)
- Improve community access to technologies to enable creation of new work (Creating)
## Assessment framework

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Measure</th>
<th>Tool</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Improve instruction capabilities (Learning)</td>
<td>a. Increase Community engagement in learning activities at multiple scales, from group-work, to class enrichment, to workshop events</td>
<td>i. Number and type of workshops being taught, by whom, for whom</td>
<td>Instruction log (existing) for library-taught workshops that captures: Workshop title, Workshop schedule, Instructor dept, number of participants, participant dept &amp; MIT status</td>
<td>1/month (average)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii. Learner/participant satisfaction</td>
<td>Instruction feedback survey at the end of instruction that captures: Noise level, Room arrangement convenience, Other</td>
<td>60% met expectations or exceeded them</td>
</tr>
</tbody>
</table>
10 objectives

16 measures

8 tools
Lessons learned

No plan is perfect

No plan survives confrontation with reality ($$)

Be specific, assume nothing

Having assessment in mind at the beginning clarifies needs
Realizing the Goals

The GIS Lab is open to anyone with an MIT Kerberos account.
Improved instruction capabilities

Instruction at multiple scales

- One on one
- Group work
- Class enrichment
- Workshops and other events
The workshops!

- Introduction to Gephi for network analysis & visualization
- Introduction to cleaning and prepping data with OpenRefine
- Introduction to using LIDAR data in GIS
- Make a Map in Minutes
- Introduction to GIS
- GIS Level 2
- Introduction to Stata
- Introduction to Python for GIS
- Virtual Reality workshop series
- Introduction to Satellite Remote Sensing
- Workshops for the following classes or programs:
  - SPURS,
  - Architecture Design Option Studio,
  - HASTS,
  - Terrascope,
  - CMS.633/833,
  - 11.A11,
  - 11.THG
  - Senseable City Lab
Consultation & collaboration space
Consultation & collaboration space
Access to expertise / Staff visibility

- Lab visible from main entrance to campus
- Staff easily accessible in lab space
- GIS + DMS office hours

If they see it, they will come!
Access to technologies

- Increased number of available computers
- Improved displays
- Better layout and capacity for instruction
- Introduced VR space and equipment
Other experimental aspects realized

- Evolving internship program supporting equity, diversity, inclusion, and social justice goals
- Development of VR Space
- Data visualization
- Software pilots
- Expanded community use of space
Assessment Results

Workshop participant experience

<table>
<thead>
<tr>
<th></th>
<th>Hearing the instructor</th>
<th>Seeing instructor materials</th>
<th>Using the technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>neutral</td>
<td>32%</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>easy</td>
<td>55%</td>
<td>66%</td>
<td>59%</td>
</tr>
<tr>
<td>difficult</td>
<td>8%</td>
<td>3%</td>
<td>22%</td>
</tr>
</tbody>
</table>

% of Responses
Number of times application opened,

- **ArcGIS**: 1789
- **RStudio**: 258
- **Gephi**: 111
- **Rhino5**: 103
- **Photoscan**: 94
- **ArcGIS Pro**: 73
- **AutoCAD**: 16
- **SketchUp**: 16
- **GeoDa**: 11
- **CityEngine**: 8
- **Pix4D**: 4
- **Maya**: 3
- **Minitab***: 87
- **Stata***: 55

**Sep 2018 – Feb 2019**

**Dec 2018 – Feb 2019**
Staff experience of space

How often did you successfully conduct **individual work** in your office?
- Always: 6
- Often: 16
- Sometimes: 2
- N/A: 1

How often did you successfully conduct **a meeting** at your desk?
- Always: 2
- Sometimes: 4
- Rarely: 1
- Never: 10
- N/A: 8

How often did you successfully conduct **an online meeting/phone call** in your office?
- Always: 1
- Never: 13
- N/A: 11
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disruptive</td>
<td>(feels disruptive to others in space)</td>
<td>58.82%</td>
</tr>
<tr>
<td>Privacy</td>
<td>(lack of privacy)</td>
<td>52.94%</td>
</tr>
<tr>
<td>Safety</td>
<td>(concerns regarding personal safety within space)</td>
<td>29.41%</td>
</tr>
<tr>
<td>Interruptions</td>
<td>(people interrupting work of staff)</td>
<td>23.53%</td>
</tr>
<tr>
<td>Security</td>
<td>(concerns regarding property within space)</td>
<td>5.88%</td>
</tr>
</tbody>
</table>
Space use

Total number of users in each space, as counted over 2 weeks on 73 occasions

- Computer lab: 124
- Low seating: 51
- VR space: 21
- High seating: 10
- Soft seating: 8

Observed occupants
Lessons learned

Serendipity works!
Word of mouth works!
Assessment is hard (to get responses)
Challenges: Security, Staff privacy, Noise management
Adaptation continues
Where we go from here...Innovation continues

- Experimental Collections Fund
  - Working with faculty to collect, process, and store drone imagery
  - Visualizing parts of the Geospatial Collection in VR
- Building services on GIS and DMS intersections
- Software experiments
- Practical tool use instruction for DMS
- Bringing the Library in to work with data
Thank you!

Let’s talk! Questions?

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https://libguides.mit.edu/gis/ | gishelp@mit.edu

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References not included on slides

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