Connecting people and resources to accelerate discovery by empowering the science gateway community

Science Gateways Bootcamp: Strategies for Developing, Operating and Sustaining Science Gateways

Sandra Gesing, Michael Zentner, Juliana Casavan, Betsy Hillery, Mihaela Vorvoreanu, Randy Heiland, Suresh Marru, Marlon Pierce, Nayiri Mullinix, Nancy Maron

sandra.gesing@nd.edu

16 October 2017
IWSG-A, Brisbane, Australia
Science Gateways Survey 2014

- sent out to 29,000 persons
- 4,957 responses from across domains
- 52% from life, physical or mathematical sciences
- 32% from computer and information sciences or engineering
- 45% develop data collections
- 44% develop data analysis tools

<table>
<thead>
<tr>
<th>Proposed Service</th>
<th>% Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation, impact analysis, website analytics</td>
<td>72%</td>
</tr>
<tr>
<td>Adapting technologies</td>
<td>67%</td>
</tr>
<tr>
<td>Web/visual/graphic design</td>
<td>67%</td>
</tr>
<tr>
<td>Choosing technologies</td>
<td>66%</td>
</tr>
<tr>
<td>Usability Services</td>
<td>66%</td>
</tr>
<tr>
<td>Visualization</td>
<td>65%</td>
</tr>
<tr>
<td>Developing open-source software</td>
<td>64%</td>
</tr>
<tr>
<td>Support for education</td>
<td>64%</td>
</tr>
<tr>
<td>Community engagement mechanisms</td>
<td>62%</td>
</tr>
<tr>
<td>Keeping your project running</td>
<td>62%</td>
</tr>
<tr>
<td>Legal perspectives</td>
<td>61%</td>
</tr>
<tr>
<td>Managing data</td>
<td>60%</td>
</tr>
<tr>
<td>Computational resources</td>
<td>59%</td>
</tr>
<tr>
<td>Mobile technology</td>
<td>59%</td>
</tr>
<tr>
<td>Database structure, optimization, and query expertise</td>
<td>59%</td>
</tr>
<tr>
<td>Data mining and analysis</td>
<td>58%</td>
</tr>
<tr>
<td>Cybersecurity consultation</td>
<td>57%</td>
</tr>
<tr>
<td>Website construction</td>
<td>57%</td>
</tr>
<tr>
<td>Software engineering process consultation</td>
<td>57%</td>
</tr>
<tr>
<td>Source code review and/or audit</td>
<td>51%</td>
</tr>
<tr>
<td>High-bandwidth networks</td>
<td>45%</td>
</tr>
<tr>
<td>Scientific instruments or data streams</td>
<td>44%</td>
</tr>
<tr>
<td>Management aspects of a project</td>
<td>38%</td>
</tr>
</tbody>
</table>
Well-designed gateways require a variety of expertise

<table>
<thead>
<tr>
<th>Role</th>
<th>Wished we had this</th>
<th>Yes, we had this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability Consultant</td>
<td>34%</td>
<td>16%</td>
</tr>
<tr>
<td>Graphic Designer</td>
<td>36%</td>
<td>30%</td>
</tr>
<tr>
<td>Community Liaison/Evangelist</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>Project Manager</td>
<td>17%</td>
<td>45%</td>
</tr>
<tr>
<td>Professional Software Developer</td>
<td>31%</td>
<td>44%</td>
</tr>
<tr>
<td>Security Expert</td>
<td>26%</td>
<td>14%</td>
</tr>
<tr>
<td>Quality Assurance and Testing Expert</td>
<td>42%</td>
<td>15%</td>
</tr>
</tbody>
</table>
Challenges

- Some topics and roles are only needed for part of the project
  ⇒ Not fully funded positions via one project
  ⇒ For diverse expertise, several different people are needed
Typical Lifecycle of a Science Gateway

- Scientists disillusioned
- New project prototype
- Funding ends
- Early adopters
- Publicity
- Wider adoption
Science Gateways Community Institute

- Diverse expertise on demand
- Longer term support engagements
- Software and visibility for gateways
- Information exchange in a community environment
- Student opportunities and more stable career paths

help@sciencegateways.org
http://sciencegateways.org/
Science Gateways Community Institute

- Diverse expertise on demand
- Longer term support engagements
- Software and visibility for gateways
- Information exchange in a community environment
- Student opportunities and more stable career paths

help@sciencegateways.org
http://sciencegateways.org/
Incubator Service

A Framework for Decision Making

**Technology Planning**
- Choosing technologies
- Cybersecurity
- Software engineering
- Interfaces to compute and data

**Business Planning**
- Business model development
- Financial planning
- Project management
- Software licensing
- Staff and sustainability planning

**Client Interaction Planning**
- Usability studies
- Web/visual/graphic design
- Impact measurement
- Community engagement
- Support for education

**Specialized Expertise**

**Security**
- Center for Trustworthy Scientific Cyberinfrastructure

**Sustainability**
- Nancy Maron, creator of the ITHAKA S+R course on Sustaining Digital Resources

**Evaluation & Impact Measurement**
- Ann Zimmerman Consulting

**Campus Resource Development**

**Network / Cohort Formation**

**Common Experiences**
- Training sessions
- Group interactions

**Continuing Engagement**
- Customized structure, content, goals
- Mentoring
- Pay It Forward

**An Ongoing Dispassionate Ear**
Bootcamp at a Glance

- 5 full days
- Teams on science gateways
- Knowledge dissemination
- Interactivity
- Community formation
- Putting away the normal daily routine
- Homework
# COURSE PLAN

<table>
<thead>
<tr>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions</td>
<td>Technology, Open Source</td>
<td>Cybersecurity</td>
<td>Outreach</td>
<td>Your Sustainability Model – Making Your Case</td>
</tr>
<tr>
<td>Course Outline and Goals</td>
<td>Mapping the landscape</td>
<td>User Centered Design</td>
<td>On-Campus Support</td>
<td>Impact Measurement Case Study</td>
</tr>
<tr>
<td>The “Napkin” Drawing</td>
<td>Going beyond your initial market</td>
<td>Goal Setting</td>
<td>Funding Models</td>
<td>Next Steps</td>
</tr>
<tr>
<td>Defining Your Value Proposition</td>
<td>Budgeting</td>
<td>Marketing &amp; Outreach</td>
<td></td>
<td>Closing</td>
</tr>
</tbody>
</table>

**MONDAY**
- Your Audience(s) and Stakeholders
- Mapping the landscape

**TUESDAY**
- Technology, Open Source
- User Centered Design

**WEDNESDAY**
- Goal Setting

**THURSDAY**
- Cybersecurity
- On-Campus Support
- Funding Models

**FRIDAY**
- Outreach
- Impact Measurement Case Study
- Next Steps
- Closing
Bootcamps

• twice per year
• additional ones can be booked (travel expenses for presenters)
• adapted to feedback
Feedback to the Bootcamps

Q4 - How well did the information you received prior to the Bootcamp prepare you to participate?

- Extremely Well
- Very well
- Moderately well
- Slightly well
- Not well at all

Bootcamp 1

Bootcamp 2
Feedback to the Bootcamps

Q8 - How likely is it that you would recommend this workshop to a colleague?

Bootcamp 1

Bootcamp 2
Feedback to the Bootcamps

"The Science Gateways Bootcamp is useful to people involved at any stage of their science gateway project, and in any role. Their experts have you consider all aspects of sustainability, from understanding your unique value proposition and audience, through to best practices and standards in software development. They cultivate a lively, active, hands-on environment. A great experience overall.”
Steve Androulakis
Manager — Community Platforms, NeCTAR.org.au, ANDS.org.au, RDS.org.au (now at Amazon)

"The SGCI Bootcamp has fundamentally altered, in a constructive way, my view toward developing and implementing the projects on which I work. The work during the week helped me to generate a new approach to the gateway on which I'm working that has much greater potential to be successful, and I intend to apply the ideas and concepts from the Bootcamp to all project phases, from idea to implementation.”
Christopher Lenhardt
Domain Scientist for Environmental Data Science & Systems, RENCI Data Observatory
Risk Analytics Discovery Environment (RADE) gateway

International Collaboration

• Hire consultants
• Partner with us
• Apply to the bootcamp
• Bring the bootcamp to you!
  (Travel expenses for 8 instructors is more cost efficient than sending 20 researchers)
Thanks for your attention!

- Longer-term, hands-on support
- Diverse expertise on demand
- Workforce Development
- Student opportunities & educator resources
- Incubator
- Scientific Software Collaborative
- Extended Developer Support
- Community Engagement & Exchange
- Sharing experiences & knowledge as a community

help@sciencegateways.org
http://sciencegateways.org/