What Researchers Want (from IT)

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Why it matters

• Research success is mission critical for many institutions
• Ability to do work is central to researcher identity, ambitions, goals
  – Will trade-off salary &/or switch institutions to improve support
• IT a research collaborator, not service provider
How do we know what we know?

• Direct & indirect info in
  – national reports (NSF, NRB, ACLS, etc.)
  – conversations with faculty
  – anecdotal & systematic reports from CIOs
  – scholarly publications on research trends
  – scholarly publications on research methods
  – trade press reports
Factors affecting researcher use of IT

- Disciplinary cultures
- Professional development
- Institutional incentive systems
- General incentive systems
- Efficiency
- Relationship between research & teaching
- Diversity of research approaches
Institutional issues

- Competition for resources
- History of privileging certain faculty, units
- Emphasis on homogeneity
- Assumptions about activity in units
- Inertia regarding institutional innovations
- Opportunities for IP for research-related innovations
Research culture issues

- Rapid spread of computationally-intense research across disciplines
- Speed & continuous nature of innovations in research methods
- The generational tide – computation often driven by graduate students, who soon start teaching their own
Decision-making about IT for Research

• Hiring commitments
• Resource allocation
• Collaborative infrastructure development
• Policy implementation
Collaborative decision-making

• Multiple options not mutually exclusive
  – Single formal advisory council
  – Multiple working groups around research problems, methods, platforms, or software
  – Open meetings
  – Survey input from faculty & administrators
  – Sustained informal relations, etc.

• Rare but successful when used
Computing Needs

• Capacity
• Stability
• Architectural flexibility
  – Research on OS/method relationships
  – Prototyping opportunities
• Training
• Software development & adaptation
More about training

• Gap between graduate education & current practices
• Inadequate reliance on current students
• Speed of innovation in research methods
• Range of diffusion techniques
• Role of training in software customization
• Institutional & inter-institutional synergies
• Linkage with methods courses
More about software

• Needs range from simple scripting all the way up
• Again reliance on graduate students
• Software specialization as national institutional niche
• Finding researcher-authored software
• Software collections (specialized, obsolete, tailored, etc.)
Networking needs

• Speed
• Flexibility
• Affordability
Data needs

• Collection
  – software, remote instrumentation, mobile instrumentation, emerging technologies (PDAs), sensor web
• Storage
• Preparation
• Presentation
  – low-tech (printers), medium-tech (e-journals), & high-tech (visualization)
Storage & preparation

• Multiplicity of types of storage
  – from project-specific repositories to long-lived data collections of global importance

• Multiplicity of storage venues
  – researcher, unit, institution, project home, discipline, national proxy institution

• Rising & complex preparation needs

• Policy issues (access, control, raw vs. cooked, etc.)
IT & ontologies

• From data to metadata to ontologies
  – for interdisciplinary projects
  – for knowledge reuse
  – for long-lived data collections

• Ontologies movement driven in part by effort to bring info scientists & disciplinary scientists into system design

• One approach to user-centered design
Conclusions

• Enduring issues such as capacity remain, but new needs have emerged
• Which needs will be most important for a given institution varies by
  – areas of research strength
  – extent of infrastructural development
  – strength of collaborative networks
The New Big Two

- Researchers need more support for learning, adapting, & writing software specific to their research problems
- Researchers need help managing their data as it enters worlds of public presentation & long-lived data archives
And . . .

- Participate in hiring process – and follow through on promises made
- Multiple utility from collaborative decision-making around research problem, method, platform, software, & resource allocations