

Introducing Pegasus: An ethnographic research project to study Grid technologies' use by the UK particle physics community.

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Research Context - GridPP

- LHC at CERN experiment looms.
- Envisage requiring a Grid of 100k machines by 2007.
- Historically successful at pragmatic use of new technology (Web, Cray, Open-source, farms). *“The computer scientists will put together the most elegant thing in the universe but it will never work... physicists will come up with the most hacked solution in the world...but it will work”*
- Highly collaborative working practices (Knorr-Cetina 1999) with few formal lines of authority
- A very different kind of organisation from those traditionally constructing such complex technical systems (e.g. NASA, National Rail).
- Out interest lies in the processes and practices of bringing such a Grid technology into widespread use.
- Particularly with the ways that Grid technology is accommodated into working practices.

Theoretical Point of Departure

- The EPSRC funding programme's aims :
 - “What are the most appropriate design methods, approaches and techniques for e-science systems?”
 - What methods are appropriate for understanding scientific practices and what are the best ways of presenting these understandings to designers?
 - What sort of tools can be used to support the design of e-science systems.”

(EPSRC: Research in the Usability Challenges to Emerge from e-Science)

Theoretical Point of Departure

- But we consider GridPP as an infrastructure within the socio-technical traditions of Information Systems (Star and Ruhleder 96; Ciborra 2000; Hanseth 2000; Ciborra 2002):
 - Not as static technical platforms, but as political accommodations and arenas within which work practices, resources and missions are surfaced, and to some degree resolved.
 - Improvised and bricolaged actions (Ciborra 2002) alongside systematic design and management practices.

Theoretical Point of Departure

- We consider GridPP usability in terms of:
 - The extent to which the practices of the community have accommodated (or domesticated) GridPP or have changed to reflect the presence and potential of GridPP.
 - Necessary to understand actors interaction with each other and GridPP.
 - We draw upon Distributed Cognition (Hollan et al 200, Hutchins 1995) as it *“provides a radical re-orientation of how to think about designing and supporting human-computer interaction...specifically tailored to understanding interactions among people and technology”* (Hollan et al 2000)

Process of Analysis

Explore “action to do science” alongside “actions of doing science” with three main research objectives to trace:

- How the specific needs of the LHC become translated into GridPP, both in the technical sense, and in the organizational sense (for the collaboration)...
- How does the Grid (actual and potential) come to influence the work of particle physicists for the LHC...
- How is the Grid used by particle physicists to do their scientific work at the LHC...

Methodological Approach

- Qualitative longitudinal research through ethnography of the work practices of particle physicists preparing for the LHC, and of those involved in the design and implementation of GridPP.
- Pilot study (probably at CDF – FNAL)

Potential Contributions

- Through our ethnographic “thick descriptions” we aim to provide:
 - A framework of qualifying guidance for the development of e-science infrastructure (a funding requirement).
 - Teaching cases and descriptions
 - Contribution to the IS literature on infrastructure.
- Your thoughts, suggestions, critique would be most welcome as we start this endeavour!