

## Particle physics Engagement with Grids: A Social-technical Usability Study

### What's Information Systems?

Information systems research involves studying how individuals, groups and organisations develop and use information technology. We study how IT is developed, managed and used within the complex social contexts of organisations and governments in a range of dimensions (as shown in the Network of Expertise diagram below).

We at the LSE have carried out research in some of the largest companies in the world, banks and manufacturing firms, government departments, and political organisations. Most significantly we focus on both the management and working practices of users alongside the technology they use. In this study, we are trying to understand how GridPP is collaboratively developing the complex Grid technology that physicists require to analyze data from the LHC at CERN.



### What is Pegasus researching?

In collaboration with UCL's High Energy Physics Department, we are studying how GridPP is addressing the considerable challenge of developing a UK particle physics Grid as part of the LHC Computing Grid. We aim to understand the practices employed in developing Grids **to do** science, and the practices of using this Grid in **doing** science.

The particle physics community has a successful record in developing cutting edge technology (the Web is an obvious example!). As a pioneering Grid project, GridPP's achievement should be of considerable interest to academic, scientific, political, and industrial audiences, as well as the general public.

Our research is tracing:

- How GridPP develops and deploys the Grid;
- What social practices are involved in this process;
- How is the Grid taken up by users in the UK;
- What difference does the Grid make to the science of physics.

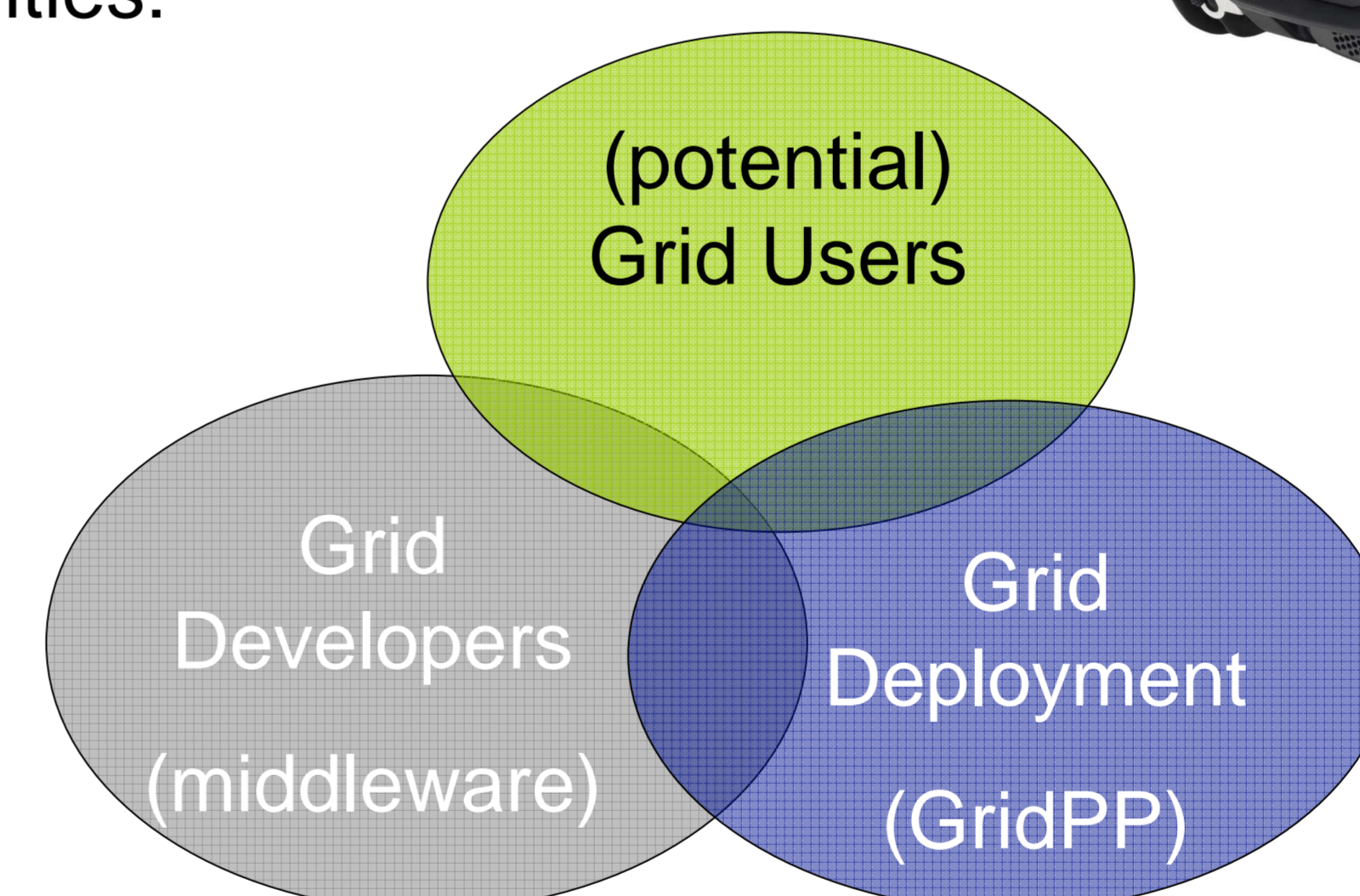


We are interested not just in the rationalistic processes of design, but also in the emergent practices, the improvisation, *bricolage*, and dynamic competences which unfold as large innovation projects evolve.

### But how do you research a distributed collaboration?

We are researching on intelligent, complicated human beings alongside the technology they construct and use. Therefore, we do not intend to conduct a scientific experiment on GridPP – instead we employ a social science technique (ethnography) which encompasses the following research activities:

- We are not isolated objective observers;
- We observe, discuss, experience and participate;
- We are interested in communication, values, ways of working;
- We are intrigued by people's interpretations of the Grid;
- We triangulate our sources of data;
- We take into account confidentiality and impartiality;
- We perform coding on data to derive themes and concepts;
- We constantly reflect upon our own interpretations of GridPP;
- We communicate with GridPP to obtain feedback;
- We make our best effort to avoid biases.



### Potential Contributions...

We anticipate our contributions in a number of areas:

- We aim to understand how GridPP coordinate the development of Grids as an improvised, *bricolage* process of systems development;
- We intend to describe the relationship between Grid "developers" and "users" and how Grids influence this relationship;
- We aim to describe how physicists negotiate the sufficiency of usability of the Grid for the LHC;
- We aim to produce a framework of qualifying guidance for scientific communities to understand how to embed Grids into their working practices.

