

# Managing e-Infrastructures in the Service Provision Era

Owen Appleton

Emergence Tech Limited, Norwich, UK.  
emails: owen@emergence-tech.com

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## 1. Introduction

After some fifteen years of development and growth, grids and e-Infrastructures are in the process of transiting from research projects to long-term sustainable facilities for European research. This change implies shifts in technology, operational models, funding schemas and management processes. These shifts can be challenging for the primarily academic research community behind most e-Infrastructures, who must rapidly acquire a set of skills more often seen in commercial or public sector service provision.

Despite difficulties, shifts in funding schemes as well as economic uncertainties make effecting these changes vital in order to ensure the European and national investments in these technologies are not squandered, and the innovative services they provide remain available to the European Research Area.

## 2. E-Infrastructure challenges

The problem can be broken down into two challenges: one of user satisfaction and one of sustainability.

The user satisfaction challenge relates to the perceived state, effectiveness and guarantees around operational e-Infrastructures. Initial user communities had a clear need that, for instance, grids solved, but with the expansion to a multi-science platform for European research, this is no longer so true. Equally, in previous phases some users were supported in learning the systems through project funding, but this era is rapidly ending. Instead users have choices about what systems they use, and therefore have requirements and desires about how they should work, whether or not these are well articulated.

Current e-Infrastructures often are complex to use (high barriers to entry), have difficulties showing that they will remain in operation (and so tempt people to move their work to them) and are offered without meaningful guarantees as to their performance or availability.

The sustainability challenge relates to continued management, funding and governance models for e-Infrastructures. It is clear that project funding was appropriate for the technology and service development phase, but that national and European funders wish to see different models for longer-term operation. This requires defining business models, cost models, defining customers and other actions out of the scope of normal academic research. A lack of understanding in these areas or the cultural gaps between academics and those with expertise in these areas presents another risk to the future of e-Infrastructures.

### **3. IT Service Management and e-Infrastructures**

The discipline of IT Service Management (ITSM) offers methods and ideas that can be used to address both of these challenges. While not a magic bullet, it has a proven track record in supporting public sector and commercial provision of services.

In the e-Infrastructure context, it provides conceptual structures and rationalized descriptions of the processes needed to manage the provision of services to large number of users. Well-known frameworks such as ITIL are used by everyone from the Disney Corporation to the US Internal Revenue Service and thousands of other organisations.

Introduction of ITSM is not, however, trivial. Due to its development in other sectors than academia, it makes some assumptions that do not hold true for Grids and other federated systems, such as linear chains of responsibility. Furthermore, the language and terminology are in a more commercial vernacular that is often poorly received in academia. To benefit from ITSM, e-Infrastructures require interpretation. Such interpretation has been developed by the gSLM project, an EC funded initiative to bring elements of ITSM to e-Infrastructures and is being continued in the FedSM project, which will introduce the idea from gSLM to three federated infrastructure organisations: PL-Grid in Poland, FGI in Finland and EGI.eu, the European coordination body for Grid infrastructures.

### **4. Introducing ITSM**

Introduction of ITSM requires a practical approach. Fundamentally, if ITSM requires the rewriting of all processes it will not be adopted. Hence the best approach is to make change incremental, and to the greatest extent make it based on re-describing and tweaking current practice rather than starting from scratch. Hence initial efforts concentrated on assessment of current service management maturity, to show Grid infrastructures where they needed to put in work, and where they were already successful. By showing the relatively small changes to improve maturity in various areas it makes change realistic and affordable.

Initial testing was carried out with the PL-Grid infrastructure, which submitted data for maturity analysis. The results were both coherent with empirical experience and also proved useful in planning improvements to service management in the infrastructure. This contributed to larger efforts by PLGrid to introduce ITSM, including a voluntary SLA with user communities, which is now used for around half of the jobs run on their infrastructure.

The maturity analysis accompanies a larger roadmap on the introduction of ITSM in e-Infrastructure by the gSLM project, which provided both policy and operational recommendations and models for improvement of service management.

### **5. Future work**

This work will be continued through the FedSM project, which began on 1 September 2012. Apart from implementing the ideas and methods from gSLM, FedSM will also create a lightweight set of minimum requirements for the introduction of effective ITSM in e-Infrastructures. This will be based on the internationally recognised ISO/IEC 20000 standard and will aim to be a de-facto standard for e-Infrastructure Service Management. Certified training on the requirements will also be provided, and a good practice guide based on introduction of the requirements in select organisations produced for the larger community.