A Conceptual Model for Virtually Organising a University

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The University is an intriguing environment in which to consider the implementation of VO structures via Grid technologies. In general the bulk of the knowledge, research and other resources that make up the academic and economic worth of a University lack synchronisation *between* organisational units. This is due to the usual range of reasons - some political, some structural and some based on communication gaps caused by discipline-specific semantics. This work suggests an approach to manage complexity, with the objective of specifying a Virtually Organised University (VOU) model that will contains a hierarchy of continually evolving, on-demand, dynamic Virtually Organised Projects (VOP).

In developing the VOU model, we are considering a bottom-up hierarchy beginning with an agent that invokes services that in-turn access the lowest level raw resources (e.g. raw data, computational cycles, etc) as illustrated in the Figure 1 below.

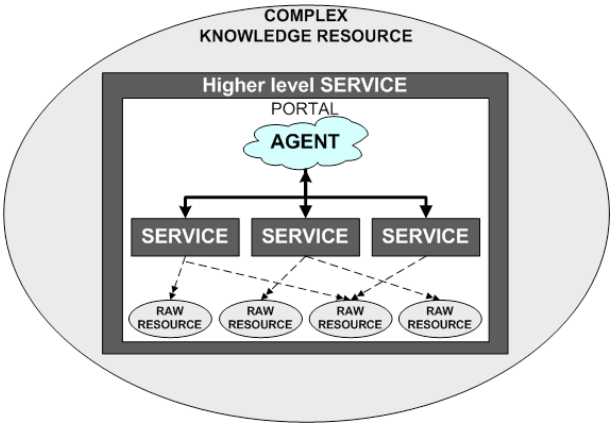

Figure 1: Base instantiation of the VoU

The result of a base-level agent processing the raw resources will be new, higher-level resources; useful information, newly acquired knowledge or some other synthesised form of the raw data. The new higher-level service will be available for use by the VOP agents and services and to create additional layers of 'new' services and resources as shown in Figure 2. The goal is to gain complete access to the complex and collective knowledge contained within the University.

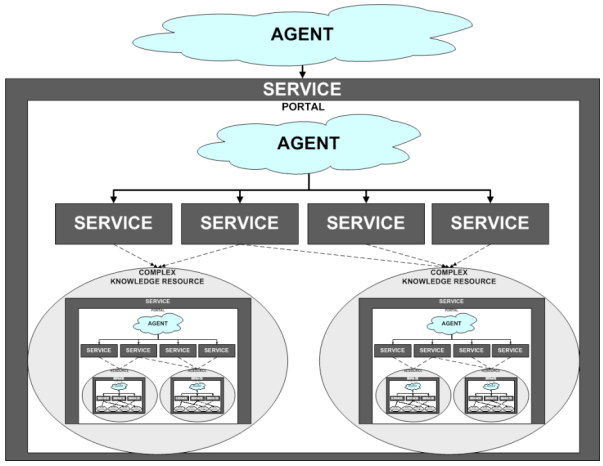

Figure 2. Hierarchy of agents and objects within the VoU.

Universities generally have a range of common resources, for example, academic datasets resulting from research activity, thousands of desktop PC's and high-speed networks. Much of the capacity of these resources is under-utilised due to lack of accessibility (e.g. discipline-specific datasets), lack of coordinated access to computing resources.

The University Campus is potentially a good autonomous environment in which to test the application of dynamic virtual organisations and the value – *if any* – of the evolving virtual marketplace. Process management with its focus on productivity and the elimination of bottlenecks and wastage, will in principle lead to sustainability and growth of an organisation. There may be economic benefits for the University from the reduction of wasted resources (e.g. datasets and computational resources) and gains from the growth in knowledge resources. In implementing a Semantic Grid within a University precinct, consideration to the cost of accessing resources is required. As the internal nature of the university 'business' is both collaborative and the generation of knowledge, cash payment for accessing resources may not be desirable. Other models, such as a pay per use points system must be considered.

Other benefits of the VOU can be envisioned, for example, the cultivation of new inter-disciplinary activity that may be fostered because of the amalgamation of knowledge resources. As well a VOU may facilitate better benchmarking of the supply and demand of data resources from an institutional perspective. General operations may also benefit from the enhanced efficiency in inter-organisational communications.