Requirements of University ITEM Systems

Conference Discussion Group Paper

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Abstract: This paper addresses the issue of requirements of University ITEM systems. A guide to characteristics is presented which is supported by two international cases.

Keywords: University, Management systems, educational support.

1. BACKGROUND

This paper arises from a desire to look at the specific requirements of ICT systems that support University education management. This appears to be a domain in which there are both general needs that apply to all educational institutions and particular needs for the University sector. This paper looks first at requirements of systems then compares these requirements with two major projects in Finland and Slovakia

2. THE PANEL

The paper arises from an extensive set of meetings between researchers and practitioners. Included were; researchers in ITEM Ronald Bisaso and Bill Davey, and Practitioners Tuulikki Paturi and Eduard Kostolansky holding senior positions in Tertiary institutions in Finland and Slovakia respectively. This mix of theoretically oriented and practically oriented participants led to a lively debate. The conclusions presented here represent those formed by contrasting the theoretical considerations moderated by practical experience of implementing University systems. The panel decided to limit recommendations to two simple questions:

1. What are the characteristics of a University ITEM system required to support the educational effort?

2. What are sensible functional areas that such a system should include?

The results of these questions were contrasted with two major projects for implementing systems in University environments.

3. CHARACTERISTICS OF ITEM SYSTEMS

The panel first decided that a design philosophy needs to be articulated. Experiences around the panel indicated that often an ITEM system is created because it is seen to have some intrinsic value. That is, some Universities seem to have chosen to implement a product or system not out of some educational need, but because it was thought to be a good idea to have a system (Tatnall, A. and Pitman, A. (2002), Davey, B. and Tatnall, A. (2003), Tatnall, A. and Davey, B. (2005), Sandy, G. and Davey, B (2005), Davey, B; Visscher, AJ & Wild, P, (2001), Tatnall, A. and Davey, B. (2001)). From a systems point of view an ITEM system is pointless unless it can both influence the environment and adapt to the environment. This means that a system must both influence the decisions of the educational manager and then be able to incorporate new directions that the manager may have set in train. This can be achieved within the original design or by design based on change and modularity (Tatnall, A and Davey, B, (2001)).

To make this a more concrete discussion the panel identified a minimum set of characteristics.

- **Organisational alignment**: An ITEM system should reflect the structure of University. Experience has shown that systems written for the USA University sector often contain assumptions about the way an organisation is structured that are difficult to accommodate in other systems. This precludes packaged solutions that are difficult to modify. Organisational alignment also implies that the system captures data and delivers information that is relevant to the objectives of the University.
- **Timely response to forces:** The panel believes that globally Universities are becoming more prone to outside forces such as government funding requirements and market forces. This requires systems that can be changed to accommodate partnership requirements in short time-frames.
- **Integration:** The various functional areas need to be able to interconnect so that information can be created using the disparate functional systems. This is often achieved using a data warehouse.
- **Upgrade and update paths built into design**: the panel commented on the rapid generational change inherent in hardware and software. Systems need to be built with an eye to platform and architecture changes.
- **Generation of management consolidation reports:** scorecard or other report types must be included in the design philosophy.

- **Regulating inputs to affect consolidated outcomes**: If ITEM systems are to be useful in management then they need to be able to do more than provide the manager with information. The decisions of the manager should be supported by the system and the manager should be able to trace the effect of decisions on educational outcomes.
- **Built-in roles that allow self-service for all stakeholders**: academics, students and those with a relationship to the system must be supported by the system. This is most clearly achieved by designing the system with built-in roles. These roles can be implemented by views, but must incorporate the common tasks that each stakeholder relies upon if the system is to produce quality data.
- **Systems for teaching, research and administration**: One of the peculiar aspects of Universities is that they have research as a function in addition to other normal educational roles. A University system must recognise this tripartite nature of the organisation.
- **Allow external connections**: Universities are commonly more integrated with the industrial community than other educational institutions. Functions such as Praxis, joint research efforts, industry sponsorships and the alumni function require a system to allow permeability with partners.
- **Inclusion of undergrad, masters, PhD**: Another peculiarity of Universities that should be an underlying design requirement is the very wide range of types of educational program from undergraduate, with a largely formal learning role through to PhD with a mostly research focus. All of these are student roles, but the information requirements and management decisions to be supported for each vary greatly.

4. FUNCTIONAL AREAS

The panel was presented with the following model of functional areas by Tuulikki Paturi. You will find a detailed explanation of this model in her paper elsewhere in this book. The panel considered this model from the view of inclusiveness of functional areas and sensible division into modular groups. This model was unanimously supported as containing all features that would be required by a system.

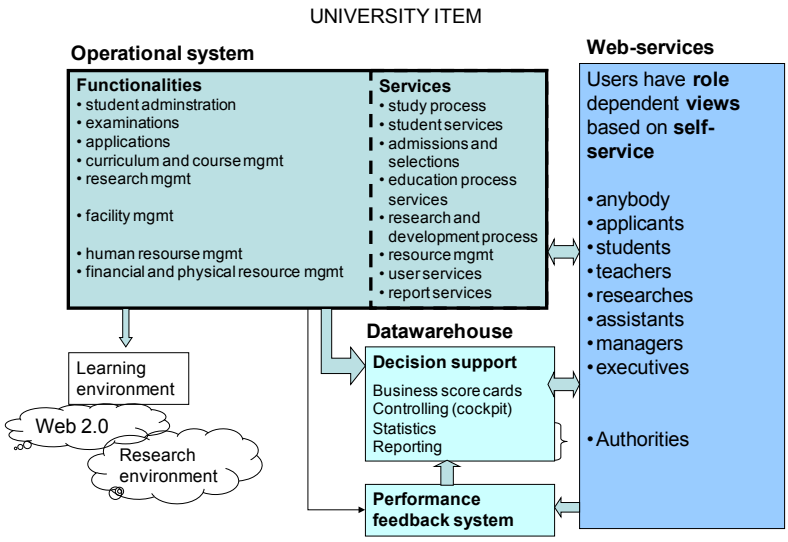

Figure 1: University Information Technology in Educational Management

5. GETTING THE SYSTEM GOING

The panel reported on a number of cases globally of systems that had great merit but became failed implementations. It was thought that a list of actors that affect the possible success of an ITEM should be compiled. The panel identified at least ten different issues that had caused systems to fail:

- Influence of committees and other groups external to the University
- Data purity
- Multiple data sources and data capture
- Privacy and IP considerations
- Security and testing
- Local needs and conditions
- Special transactions should be contained in loosely coupled modules
- Change management
- Migration path
- Nature and change life cycle.

6. A SUCCESSFUL IMPLEMENTATION

In contrast to the last point of discussion we were able to identify one system that had been implemented as a National system. In Slovakia the decision was taken to implement a system at the National level with complete ownership of the data at the institution level. This system was implemented as a phased implementation using the SAP (R/3) database as a foundation. The system was commenced with a student records module

providing a central database of Slovakian student enrolment. This was seen as adding immediate value as a student could take courses anywhere in Slovakia with minimal problems. The system was then rolled out in stages:

- Personal records
- HR then added for 3 months trial
- Research and other grant related data
- Financial system (linked with government funding system).

7. CONCLUSION

The panel found that the problems inherent in creating a useful university ITEM system are a globally common. The factors identified are more general in nature than are normally considered when creating a set of requirements. The panel feel that taking a wider philosophical view of what an ITEM system is intended to provide will lead to more appropriate system being created.

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