

Modeling Organisational Frameworks for Integrated E-learning: the experience of the TrustDR project

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Abstract

This paper discusses the need for a way to model the organisational frameworks required to integrate e-learning into institutions and the potential benefits of doing so. A shareable and adaptable general-purpose model of integrated e-learning is introduced based on recent research. An example of the model being applied is given in a real-life context: the TrustDR project funded by the JISC (Joint Information Services Committee), which is examining practical ways of introducing digital rights management (DRM) systems into the UK educational sector for learning object repositories. Finally, some ideas for further development are presented.

1. Introduction - the current situation and need for a model

The TrustDR project is seeking to understand the problems associated with managing Intellectual Property Rights (IPR) in institutional repositories of learning objects, in order to develop practical solutions for developing DRM systems. More information about the project can be found at: <http://www.uhi.ac.uk/lis/projects/trustdr/>. In scoping the project outputs we had to map the complex legal and technical aspects of DRM requirements to the actual working reality of equally complex institutions. It quickly became apparent that this was not going to be a trivial task and that the project team needed some method to capture and share meaning across a variety of domains. It also became clear to us that implementing DRM in learning materials in educational institutions shared the same organisational problems experienced by the e-learning community.

Many researchers and practitioners are coming to the conclusion that the real challenge in successfully implementing e-learning is changing the structures and cultures of our institutions so that they can effectively

implement e-learning and flexible learning, [1], [2], [3], [4], [5]

To engage in these kinds of task of in the corporate world would be considered a classic example of 'process change' and therefore a difficult and often risky proposition. To do the same in educational institutions such as universities which are loosely structured and where the actors enjoy a large degree of autonomy over their teaching organisation and practice also represents a quite profound challenge. Not surprisingly the results to date are generally acknowledged as having been disappointing:

"The current situation can best be described as high-level ambitions with poor implementation"

van der Klink & Jochems [6]

Casey et al [7] give a useful overview to the challenges that learning objects and e-learning etc. poses to institutional structures and professional cultures. As Carol Twigg [4] in the USA has observed e-learning has tended to remain as a 'bolt-on' to existing institutional structures and processes and is therefore unable to realise its full potential. The impact of e-learning and management information systems as well as the move to more flexible and learner-centered education [8] contain very different imperatives and organisational models that place a greater premium on the more rapid and accurate communication of information from the different parts of the institution in a more coordinated way than before. The new technologies in particular can forcefully bring to the surface aspects of existing institutional structures and cultures that have hitherto remained informal and invisible (a reification), Pollock and Cornford [9] have produced a useful analysis of this phenomenon. Even cutting-edge e-learning providers such as the University of Southern Queensland in Australia [5] are having difficulty in keeping up with the degree of change required and report having to resort to 'work-arounds' to keep their provision going while the

institution tries to catch up with the demands of a more flexible and student-centered curriculum.

Until now little coherent planning or analysis has gone into adopting e-learning, generally the pattern has been to try and do the same thing faster, rather like the response of the American Pony Express mail service to the development of the railroads; they bought faster horses in larger numbers [4]. Similarly we should not be seeking to mimic traditional patterns of education with technology, the real challenge is what to change and how to do it. This requires a holistic approach from the outset and recognition that the use of technology is not just an adjunct but requires fundamental change. This in turn demands some form of analysis and planning exercise before making major commitments.

In this confused situation we need help to understand the 'problem space' that e-learning represents. It would be very useful if the different actors involved could use a model as a way of sharing and negotiating meaning across the boundaries of their 'communities of practice', [10] especially if those actors have traditionally had little or no meaningful communication or negotiation in the past - as is often the case in educational institutions. For our purposes the model should be:

- Simple and easy to grasp – easy definitions
- Adaptable and extendable – i.e. facilitate customisation to local contexts
- Have some level of shared abstraction that is meaningful across the different groups – thus hopefully providing a 'bridge' for the negotiation and sharing of meaning.
- Support textual and graphical representations

2. What to model and why?

The short answer to this question is that in order to understand how to successfully implement e-learning in our organisations we need to understand how they work in the first place in order to change them effectively. Clearly, accepting the 'official' explanation of how these types of organisation function is inadequate. This explains the healthy trade in senior management employing external consultants in order to understand their own organisations. We need to move beyond this type of 'episodic' organisational learning and development to a more continuous 'in-house' process. To do this we need to know how people conceptualise their roles in the organisation – the reality is often far from the official line and dominated by a 'silo mentality', usually overlaid with a rich local folklore.

Singleton [11] comments that this state of affairs is common in large organisations and that the central

service departments such as computer services and information services faced with designing an e-learning infrastructure will try their best but are destined to deliver a technical solution to what is essentially an educational problem.

"Hardware systems tend to be dominated by engineering thinking and macro-systems are dominated by economic thinking."

As an aside, we could add that putting these kinds of service departments in charge of educational strategy clearly tells us a lot about the deficiencies of the educational philosophy of the institutions concerned.

The drive towards the kind of analysis of workplaces that we are advocating derives from systems theory. Yet such an approach to management and planning is often very difficult because the individuals at different levels in an organisation find it difficult to conceive of the 'bigger picture' due to the local detail of their own situations and working cultures.

To overcome this obstacle, modern systems theory seems to offer some help. It provides some useful analytical tools for identifying and understanding the dynamic relations between the factors we have been discussing in this report. Senge and Sterman [12] develop this theme in the context of *Organisational Learning* - a concept which is growing in interest, and it is worth briefly looking at some of their recommendations. They propose a 3-stage process for developing a better understanding of how an organisation actually works by the people within it:

"1/ *Mapping mental models* - explicating and structuring assumptions via systems models;

2/ *Challenging mental models* - revealing inconsistencies in assumptions;

3/ *Improving mental models* - continually extending and testing mental models."

They make the important point that flaws in the understanding of how an organisation works cannot be corrected until they are made explicit, which is the purpose of the modeling exercise. There is no reason to think that such an exercise could not be applied to higher education. Ramsden [12] more or less says the same in the context of higher education teaching:

"Half the difficulty with doing it better is knowing what the real problem is"

The main benefit of this kind of exercise in education would be in the process of constructing a qualitative model of e-learning that would provide a means of gaining some shared insight and understanding at a personal and institutional level that would support the kind of exercise recommended by Senge and Sterman [12] above. Corben et al [13] are

clear about the benefits of this kind of process, which they describe as ‘qualitative mapping’:

“The method forces rigorous thinking and provides a good compromise between the context-free approaches of most high level approaches to change management, and the detail and clutter of most low level approaches to business process re-engineering.”

3. A useful model

First, a warning about models and indeed all representations of complex organisations - they are fictions and should not be mistaken for reality (a common mistake in project management for instance). But they are useful fictions if they allow us to get closer and understand the reality of what we are examining. The model presented here is a useful generalization – it has to be adapted and ‘tweaked’ to the specifics of a local situation. As we shall show it can be the source of a variety of useful analysis and communication tools. Potential uses are as numerous as the variety of contexts under examination, but some stand out: ‘round-table’ discussion aids, planning tools, and a useful form of ‘institutional memory’. One final warning, no model or tool can make individuals or departments communicate and cooperate and the mere application of the model etc. such should not be confused with improvements in the organisation. In other words this model is not a panacea to make dysfunctional organisations whole again – but if used correctly can help identify those aspects of the organisation that need to be changed.

In developing this model we have found the ideas, approaches and concepts in *Integrated E-Learning* introduced by Jochems, Merriënboer & Koper [2] very useful, especially those of van der Klink & Jochems relating to organisational issues [6]. This model also draws on recent work by Collis & Moonen [1] and Normand & Littlejohn [14]. All these researchers propose analysing and viewing the functional institutional structures at three levels to situate the perspectives of the relevant ‘actors’ who are involved in providing and supporting e-learning in an institution. In addition van der Klink & Jochems [6] suggest adopting 4 ‘perspectives’ at each level. On this conceptual basis we have come up with a simple yet comprehensive organisational model that is intuitive and can be easily adapted and extended to describe most educational institutions.

3.1 Three levels in the organisation

There are three important hierarchical levels of actors from within the institutional provider that need

to inform our exploration and understanding of the implementation of e-learning and flexible learning in reality.

Institutional Management (IM) - management bodies (Boards, Senates, Courts), Principals, Pro Vice Chancellors, Institutional Secretaries, Service Unit Managers (Estates, Information Services, Registry). The senior figures directing the strategy and direction the institution is following, deciding on the specific technical infrastructure, stating the mission with respect to educational values, aims, and policy; making technical support available; possibly deciding on the general level of support and training to make available to academics and so on

Operational and Curricular Management (OM) - those in charge of gathering and organising the necessary resources and implementing strategy, within the constraints of the institutional context and budget. Managing the programmes by deciding the types of course to be delivered by the academics, structuring the programmes and deciding on the sequence of courses.

Teaching and Learner Management (T-LM) – those who are responsible for carrying out at a practical level the actions required by the strategy. Developing and delivering courses, identifying learning resources and organising them and managing the learning activities of the students. Those involved in supporting roles in technical areas, administration and information management.

As you can see from our descriptions this hierarchy of actors has to deal with increasingly detailed contexts to operate within as we move towards the Teaching Level. The successful implementation and ‘mainstreaming’ of new approaches such as learning objects would require that these different institutional levels are in alignment and work as a coherent whole [14], [1], [6]. Thus, the organisational model might also usefully fulfill an analytical and diagnostic role for those tasked with implementing e-learning in an institution – opening up the intriguing possibility of representing the dysfunctional aspects of an institution in relation to the chosen aspects of e-learning.

These different levels in an institution tend to have, naturally, different contexts or ‘filters’ on the process of adopting new processes as follows:

The Institutional Management (IM) will be looking for the ‘big picture’ items like, retention and progression figures, exam grades, costs, market share, educational profile, long term planning, etc.

Operational Management (OM) will tend to see this as the delivery of ‘product’ and relate it to departmental budgets and targets, quality control, and the type and costs of learning materials etc and crucially, the task of introducing new working practices.

Teaching and Learner Management (T-LM) is concerned with mechanisms for delivery (face-to-face or online), the balance between guidance/facilitation roles and instructions, assessment procedures and the type of learning resources,

3.2 Four different perspectives

In addition to these three institutional levels van der Klink & Jochems [6] propose that at each level it is possible to see the problem space from four different perspectives (giving us, potentially, a family of analysis and evaluation tools – that we shall turn to later).

A Technological View The use of technology in such a way that it can support the actors at different levels to carry out their functions and achieve their targets. Until now the premise was that supplying staff and students with an adequate infrastructure was enough to improve educational programmes – this has not been upheld. Technical aspects were focused upon without understanding how this would support pedagogy or strategic goals or taking into account the organisational context.

A Strategic View The organisational strategy and business processes that have to occur to support the change and how embedded they can become in the organisation. E-learning cannot be regarded as an isolated issue, it is expensive and impacts on a large number of institutional processes and good reasons are needed for its implementation. Awareness of what might realistically be delivered is needed and clear goals are required in relation of internal strengths and weaknesses and external threats and opportunities.

A Pedagogical View This is required to determine the sensible use of the technology – a considerable number of questions need to be answered ranging from the extremely practical to the more philosophical. van der Klink & Jochems [6] recommend that it is very useful to start with rethinking views of learning, instruction and teaching to encourage staff to think beyond their current frameworks. Interestingly, Goodyear et al [3] also recommends this approach as well and produces a very useful discussion of this, which we would recommend highly, and has also been adopted by the USQ in Australia [5].

An Organisational View This includes the ability to identify and evaluate the interplay between personal, departmental, cultural and professional viewpoints played out within an institutional context. The introduction of e-learning will either be an innovation (usually a bottom-up and non-sustainable activity that accounts for much of the present scene) or a transformational change that requires top-down involvement and will affect all aspects of the

organisation. In the first scenario little will change – although tensions will increase but be unresolved. In the second scenario the roles, responsibilities and relations of the departments and individuals in the organisation will be strongly impacted upon and change.

4. A graphical representation of the model

The diagram below in Fig. 1 illustrates the model with the three hierarchical levels combined with the four different perspectives to provide an integrated whole. The fact that the 3 levels of institutional organisation are in alignment indicates that they are working well and coherently to deliver e-learning opportunities – the vertical lines indicating channels of communication around certain perspectives or views. Where the vertical lines intersect at the corner of the squares represent those activities and perspectives at each institutional level. The significance of each of the

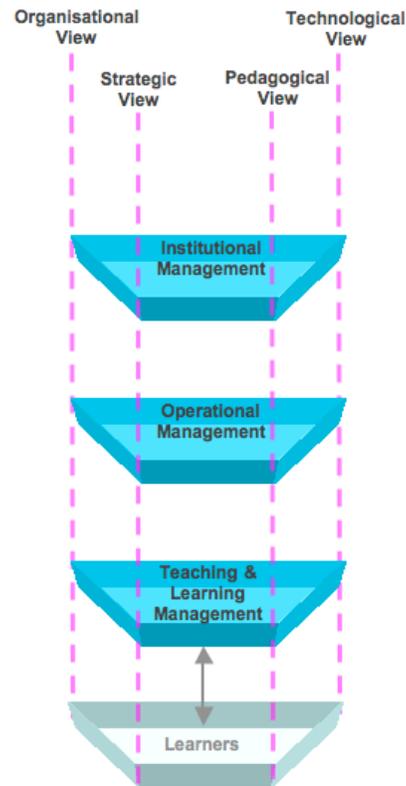


Fig. 1 The Organisational Model

Level \ View	Teaching & Learner Management	Operational & Curricular Management	Institutional Management
Pedagogical			
Technological			
Organisational			
Strategic			

Fig. 2 Basic Analysis and Audit Tool Derived from the Model

perspectives will naturally vary across the different levels of any institution

5. Deriving analysis and audit tools from the model

The model can be used to produce a series of grids, matrixes and other representations that enable us to record succinctly and in an easily shareable manner the different aspects of the institutions we want to describe and analyse. We can start with a 3 column by 4-row grid as shown in Fig. 2 and use that to derive a set of tools. We have used these tools to help analyse and evaluate a number of different organisational factors relating to implementing a DRM system. The current set of tools with their working content can be found at this web address: http://www.uhi.ac.uk/lis/projects/trustdr/work_in_progress.html under the heading of WP SP2 Organisational Modelling Framework - Analytical and Evaluation Tools.

6. Evaluation of the model

So far the use of this model and the derived tools has indeed proved useful in facilitating 'round table' discussions between the project team who work in the separate domains of learning technology, information management and systems development. We intend to test the functionality of the model further by using the tools with project partners and recording the results. We shall be including the model and tools in the project outputs as part of a DRM system developer's kit to facilitate analysis and communication activities.

7. Future developments

The advice 'keep it simple' springs to mind; one obvious application is that once an analysis is completed and decisions taken or a strategy formulated then the model can provide ways of disseminating what is required at each level from the various perspectives. The same documents may also provide a useful evaluation or audit tool.

From a planning and evaluation perspective the model can also help in determining the 'Return on Investment' in relation to e-learning as discussed by Collis and Moonen [1]. In this respect it would also help to identify the likely winners and losers arising from the proposed changes involved in implementing e-learning. This aspect of e-learning, its 'political economy', is an increasingly important one and being able to represent it a very useful function.

Another possibility is to act as a support tool to gather and collate information to feed into more

dynamic organisational modeling and planning activities. This might include visualization tools that help institutional management understand the possible effects of their decisions.

8. References

- [1] Collis, B and Moonen, J. *Flexible Learning in a Digital World*, 2nd ed. Routledge & Falmer, London, 2004,
- [2] *Integrated E-Learning: implications for pedagogy, technology and organisation* Jochems, W., van Merriënboer, J., and Koper, R., Routledge & Falmer, London, 2004,
- [3] Goodyear, P. et al, *Effective networked learning in higher education: notes and guidelines* Published by JISC-JCALT & CSALT Lancaster University, 2001. Available at: http://csalt.lancs.ac.uk/jisc/guidelines_final.doc
- [4] Twigg, C (2005) *Keynote Summary: Improving Learning and Reducing Costs - New Models for Online Learning* in the ALT-C 2005 conference, ALT-C, Manchester, available at <http://www.alt.ac.uk/altc2005/keynotes.html#carol>
- [5] Postle, G, *Online Teaching And Learning in Higher Education: A Case Study*, Commonwealth of Australia, 2003. Available from the Australian Government web site at http://www.dest.gov.au/sectors/higher_education/publications_resources/other_publications/online_teaching_and_learning_in_higher_education.htm
- [6] van der Klink, M., & Jochems, W., Management and organisation of integrated e-learning in *Integrated E-Learning: implications for pedagogy, technology and organisation*, Jochems, W., van Merriënboer, J., and Koper, R., Routledge & Falmer, London, 2004,
- [7] *Prospects for Using Learning Objects and Learning Design as Staff Development Tools in Higher Education* Casey J., Greller W., & Brosnan K., published in the Proceedings of Cognition and Exploratory Learning in the Digital Age (CELDA 2005) 2005,
- [8] Casey, J., Wilson, P., 2006, *A Practical Guide to Providing Flexible Learning in Further and Higher Education*, Quality Assurance Agency for Higher Education Scotland Committee, Glasgow, 2006 (in print - due to be published Spring 2006)
- [9] Pollock, N., & Cornford, J., Theory and Practice of the Virtual University: report on UK universities use of new technologies. In *ARIADNE issue 24*, 2000 <http://www.ariadne.ac.uk/issue24/virtual-universities/>
- [10] Wenger, E. *Communities of Practice*, Cambridge University Press, Cambridge, 1998
- [11] Singleton, W., *The Mind at Work; psychological ergonomics*, Cambridge University press, 1989

[12] Senge, P., & Sterman, J., Systems Thinking and Organisational Learning: acting locally and thinking globally in the organisation of the future, in Morecroft, J., & Sterman, J., *Modelling for Learning Organisations*, Productivity Press, Portland, Oregon, 1994

[12] Ramsden, P., *Learning to Teach in Higher Education*, Routledge, London, 1991

[13] Corben, A., Wolstenhome, E., & Stevenson, R., A product improvement case study using systems modeling, in *Executive Development*, (8, 4), pp 32-36, MCB University Press (now Emerald), 1995

[14] Normand, C. Littlejohn, A., *A Model for Effective Implementation of Flexible Programme Delivery*, Quality Assurance Agency for Higher Education Scotland Committee, Glasgow, 2006 (in print - due to be published Spring 2006)