The impact of institutional mergers on information systems and blended learning provision in South African higher education

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The period within which higher education mergers have taken place on a large scale internationally overlaps with a phase characterized by extremely rapid take-up of information technologies in higher education. This article analyses the implications of institutional mergers for information systems development in the South African higher education system. The analysis is undertaken with particular reference to the new institutional shape as envisaged in the higher education merger plan, and with reference to the characteristics of current higher education information systems. This article will draw attention to the key decisions that can influence the outcome of information systems integration in higher education mergers. Particular emphasis is given to the challenges of planning, and implementing online blended and collaborative curriculum modalities in the context of institutional mergers.

Keywords:
Information systems, distance learning, online learning, merger, higher education, knowledge management

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INTRODUCTION

Higher education mergers have been undertaken with the view to achieve a variety of goals in a wide range of national systems, including South Africa (Jansen et al,2002, Hay and Fourie,2002). In the United Kingdom, and elsewhere, the move toward bigger institutions is driven in part by government's intention to widen participation, expand student numbers (THES Editorial, 2001) and reduce wasteful overlaps in programmes (Utley,2001). Mergers are also undertaken to improve institutional shares of markets (Borrego,2001; Maslan,2000) and of research funding (Ashraf,2002). Often cited reasons for mergers refer to expectations regarding economies of scale in geographically adjacent institutions. It is claimed that within a merged and unified administration, purchasing, estates management, student services and information technology provision produce substantial savings (Light,2002; Gould,1997). It is argued moreover that information systems have a key role to play in leveraging many of the key benefits expected from higher education mergers.

Yet the literature on mergers has given more attention to institutional cultures, the politics of negotiations, the morphology of organisational structures and curriculum implications (Jansen et al.2002; *Higher Education* Special Issue Vol.44 No.1, 2002; Harman and Meek, 2002; Jansen, 2003), and has neglected the role of information systems. The lack of attention given to the role of information technology in mergers is ironic, because the period within which higher education mergers have taken place on a large scale across the globe overlaps with a phase characterized by extremely rapid take-up of information technologies in higher education. From the 1990s, the internet connectivity boom opened up competition in local and global education environments (Castells,2000). Internet technologies have enabled higher education institutions to expand their operations beyond traditional face-to-face learning, by supplementing the contact based learning modality or by offering distance education programmes based entirely on the Internet.

The need to integrate or align higher education business models and information systems remains one of the most important ongoing challenges in the sector internationally, but many institutions have been slow to respond. There are two main reasons for this. First, resource scarcity is a severe impediment to the implementation of information technology solutions in higher education. Castells (2000) has noted the propensity for information and communication technologies to exacerbate rather than ameliorate pre-existing inequities both within and between societies. The same can be observed between higher education institutions that differ manifestly in terms of the extent to which they have been able to implement such information systems.

Second, information system issues are still understood by some higher education management teams as a support function rather than as integral to institutional planning and strategy. As a result, they fail to appreciate the centrality of information systems in providing the platform for implementing an institutional knowledge management strategy. There is little doubt that in South Africa, there are wide disparities in the extent to which information systems – or for that matter knowledge management systems - have been recognised as central to the development of higher education institutions.

The strategic issue of concern in this article is with the development of information systems in South African higher education institutions, rather than mergers per se. However the recent process of institutional mergers in South Africa represents an important opportunity, firstly to upgrade information systems across the sector. Second, the phase of mergers presents challenges and opportunities for those 'new' institutions that seek to develop their capacity to provide online collaborative and blended forms of learning to their current and future generations of students. In order to properly take advantage of these opportunities the new institutions must integrate information system planning with strategic planning processes and with institutional knowledge management practises

This article asks two main questions. First, how will the South African higher education merger plan, and the characteristics and capacities of information systems of the former campuses influence the integration of information systems in the new institutions? Second, how will the configuration of information systems in the merged higher education institutions facilitate or limit curriculum development based partly on blended and collaborative learning forms? This is admittedly an ambitious task, since the article deals with a range of interconnected elements: information systems, learning technology infrastructure, curriculum development, distance and blended forms of learning and strategic institutional planning. In addition, the mergers have upset the old spatial arrangement of higher education institutions in relation to their student populations, that could lead to new alliances of institutions in providing different and even competing patterns of access.

This article therefore represents an attempt to 'map' the current and emerging issues and not to present a definitive account of the field. Furthermore, the article can only identify issues and challenges in a general way. This work would have been enriched through data arising out of a case study approach to understanding how the merger process is taking place. Unfortunately this methodological option was well beyond the limitations of this particular offering.

The article consists of two main parts. The first deals chiefly with higher education mergers and information systems Accordingly it will briefly introduce the centrality of information systems for higher education, and then will outline the policy on mergers in South Africa. There follows an extended discussion of the key implications of mergers for information systems in South African higher education. The second part of the article attempts to explore how the provision of blended and collaborative learning in the merged institutions will be influenced by strategic choices of delivery mode, curriculum development, and inter-institutional collaboration in order to reach student populations.

In this article, "information systems" is preferred as a shorthand which refers to the combination of information and communication technologies arranged in a systematic fashion in an institution, for the purpose of capturing, processing, analyzing, creating, transmitting and storing data and information. This assumes a non-technicist understanding and recognizes the importance of interaction between human and information systems

SOUTH AFRICAN POLICY ON INSTITUTIONAL MERGERS AND IMPLICATIONS FOR INFORMATION SYSTEMS

The development of policy on higher education in South Africa is strongly politicised and is subject to competing demands for local equity-driven and global competitive-based performance frameworks (Jansen 2001). As reflected in the National Commission for Higher Education Report of 1996 and the White Paper (No.4) of 1997, the challenge for government is how to balance the need for equity while allowing for competition and sustainability in the same higher education environment.

More recently, the Department of Education (DoE) has produced a number of key documents that act as reference points for higher education transformation. The National Plan for Higher Education (2001) outlines five policy goals that guide the framework for transformation. These goals are to:
- Increase access
- Promote equity, to redress past demographic inequalities
- Ensure diversity, to meet national and regional skills and knowledge needs
- Build research capacity
- Reorganise the institutional landscape; establish new forms and identities

This was followed in 2002 by a document entitled "Transformation and Restructuring: A New Institutional Landscape for Higher Education" (Department of Education, 2002) (hereafter the 'Institutional Landscape' document) which outlines the intended rationalisation of the sector, giving specific recommendations for the regional consolidation of universities and Technikons. The clustering recommended in the report reduces the number of higher education institutions in South Africa from 36 to 21. The selection and allocation process by which institutions were grouped together for mergers has been strongly contested, but this article seeks to consider the challenges for information systems in facilitating the envisaged mergers.

To provide some perspective on the size of the project, the 36 higher education institutions in 2000 consisted of 21 universities and 15 Technikons. These institutions provided for 591 161 students of which 65,7% were registered at universities and the balance registered at Technikons. There were some 14 789 permanent and 24 002 temporary academic staff employed at these institutions. The 2003/4 budget for the sector was R8,9 Billion(US$1,27Bn).

The timescale given in the New Landscape document specified that institutional implementation plans should be developed for the period, 2004-2006. The Ministry is adamant that "substantive" integration can take place in a relatively short timescale, arguing that "it is a three-to-five year process depending on the type and organisational complexity of the merged institutions"(Department of Education,2002, 34-38).

A scan of the challenges for mergers that the Institutional Landscape document raises shows that there are multiple dimensions through which information systems can contribute. These include supporting integration at the substantive or institutional level to the technical and systems level
- establishing a new culture and ethos
- developing new academic structures

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- integrating academic programmes
- integrating administrative, financial, procurement and computer systems and procedures
- developing financial plans and consolidated budgets
- integrating support services
- integrating facilities and infrastructure planning and utilization (Department of Education,2002,38-39).

In South Africa, the New Landscape document clearly recognises the importance of "the core activities necessary to give effect to the merger such as integrating administrative, financial and *computer systems* (emphasis added)" (Department of Education,2002,35). That the structure and functioning of information systems must be redesigned in order to support such institutional arrangements is indisputable.

MERGING INSTITUTIONS AND INFORMATION SYSTEMS

A merger will consolidate the merging entities in ways that have implications for information systems. Different kinds of merger will have consequences for information systems, as sketched below.

- There is a *weak merger* where the partners retain their original identities. There are low levels of strategic linkages in the information systems. Therefore semi-autonomous information systems are hardly affected.
- There is a *strong merger* where constituent organisations retain limited independent identity and powers. Strategic interdependence is high. Post-merger information systems integration is complex.
- There is *full absorbtion* with pressure to assume a unitary institutional identity. Full operational consolidation is required. There is greatest difficulty in post merger integration of information systems infrastructure because it requires high levels of strategic interdependence

The mergers envisioned in the new South African Institutional Landscape accord with the *strong* or *full absorbtion* models described above. The Institutional Landscape document presses for what it terms as 'substantive' integration of institutions that goes beyond the formal adoption of new policies, procedures and structures. The Institutional Landscape document argues that the fundamental aim of mergers is "the creation of a new institution in the full meaning of the term, that is real integration with a new institutional culture and ethos that is more than the sum of the parts" (Department of Education,2002,39).

Table 1 is a summary of the plan for merged institutions as envisaged in that document. As indicated, 36 institutions have been reduced to 21 through mergers. The left hand column shows the number of new institutions that are the product of the merger of a number of formerly independent universities or Technikons. In effect many of the new institutions consist of multiple campuses there are with a particular number of constituent sites.
Seven of the reduced set of 21 institutions have not been made part of a merger, or have not been required to incorporate another campus or unit. These institutions have an advantage in respect to the stability of their information systems which will not be obliged to undergo major disruptions – at least on account of the mergers. However, there are eight instances where a proposed merger involves three campuses, one example that involves four campus entities, and five new institutions which consist of two campuses

Table 1: Summary giving the number of sites per new merged institution

NUMBER OF SITES PER MERGED INSTITUTION	NUMBER OF INSTITUTIONS
1 (ie: no merger with any other institution)	7
2	5
3	8
4	1
TOTAL	21

The number of sub-units and their geographical dispersion – in terms of distance from each other - represent a challenge for generating a unitary institutional identity. Arising from such configurations there are also significant academic and management challenges with respect to: consolidating learning programmes, sustaining program quality, supporting academic staff communications and securing the integrity of administrative systems. The extent to which the new institutions meet these fundamental challenges will dependent on the implementation of

information systems that are based on, or are aligned with the new mission of the institution and based on sound knowledge management principles.

This situation presents both challenges and opportunities. First, with increasing numbers of satellite campuses, all aspects of institutional management become more complex with obvious information system implications and challenges.

Second, the distance separating campuses from each other is a major factor. Distance has both positive and negative consequences. On the one hand, dispersed campuses present the opportunity of reaching a greater market of potential students. But this distance will have the unwanted effect of increasing time and travel costs associated with face-to-face interactions between staff members – academic or administrative. Consequently, information systems such as intranet infrastructures which facilitate communication become more important. This is not necessarily a simple matter of systems implementation, since technologically mediated interaction presents many challenges.

Third, the merged institutions are much larger in scale, which can bring potential economic advantages. But this cannot be realised until various systems have been put in place to leverage the potential advantages of economies of scale. Information systems can make a vital contribution toward accruing such benefits by canceling out distance as a factor.

Lastly, the merger process presents a strategically important opportunity for institutions that hitherto have had poorly developed information systems to obtain the needed information system functionality as part of a newly merged mega-institution.

INFORMATION SYSTEM INTEGRATION IN MERGERS

A critical challenge for management in a merger is to identify the appropriate option for information systems integration in two strategic dimensions (See Table 2 below). The first dimension concerns the location of the computer architecture. This may range from full 'centralisation' to a fully distributed approach. Such a decision becomes more complex as the number of sub-campuses which will comprise the new merged institution increases.

Table 2: information system integration options in a higher education merger

Computer architecture \ Software	Standardised	Partially standardised	Not standardised
Centralised	Total integration		
Partially distributed			
Fully distributed			No integration

(Giacomazzi, et al, 1997,291)

The second dimension concerns the level of standardization between software systems which can be fully standardized or structured at different levels of partial standardization. The decision in this dimension becomes more complex where the constituent institutional systems have different levels of development (eg: bringing with them legacy systems) and different software applications (eg: from operating systems through to end-user software).

These two dimensions define the levels of interoperability and data sharing that can be achieved between the constituent information technology sub-systems. Targeting the highest possible level of integration of the information technology systems will maximize the capacity of information systems to support integration of a range of business and communication activities at the technical level of operations.

Total integration will not necessarily be the most appropriate option. This is because the application of the Internet can offer high levels of functionality where particular information system structures or functions are decentralized to one or more campus rather than brought to the centre. Although obtaining centralization will be tempting as a big

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bang plan which levels creates the opportunity for interoperability from scratch, planners may discover that the costs associated with implementing a new system to be too expensive in terms of capital investment, the migration of old systems and the disruption of personnel.

The two main functions of higher education information systems - to support academic programmes and management functions - are increasingly inseparable at the systems level as the technology of internet portals and of Enterprise Resource Planning systems are capable of bringing together various levels of functionality together in one system. Nevertheless they must be considered separately as they have different cost drivers. The value of ERP for the purposes of higher education is that through such systems, all areas of the institution's operations can be integrated and made 'conversant' with one another. These systems can provide value in terms of savings from automating processes, improving workflow, tightening controls and providing a user friendly interface. But this is the ideal. In practise, many ERP systems are only loosely integrated, some have their own databases and user interfaces and data sharing is limited to periodic batch transfers. Furthermore, ERP are long-term projects with a timescale of several years in implementation, and are expensive to put in place (Swartz and Orgill, 2001).

CHALLENGES FOR MERGING INFORMATION SYSTEMS IN SOUTH AFRICAN HIGHER EDUCATION INSTITUTIONS

Over and above fundamental issues regarding scale, the number of campuses, their spatial locations, and strategic decisions around the integration strategy, attention must also be drawn to the actual characteristics of the information system(s) in each constituent campus that will influence the eventual shape of the information system of the merged institution.

- The campuses with a larger proportion of legacy (old) systems and stored data will have higher initial investment requirements to make their systems compatible and functional. In some instances, the development of information systems may require the digitization of administration, research and learning and teaching systems and processes. Given the diversity of current information systems in South African higher education institutions, adequate account must be given to the integration of: "divergent IT/IS technologies, incompatible data structures, and ageing or badly documented software"(McKiernan and Merali,1995,59).
- The purchase of software licenses is significant expenditure for higher education institutions. Decisions regarding such purchases have long term implications. There is a need to avoid the problem of incompatibility by limiting software choice and diversity in the institution. Microsoft standards apply de facto throughout much of academia, the pressure will be on to stay with the status quo because if the high technical and financial cost associated with changing from Microsoft to alternative products, and negative reactions in the user communities. The concern is that institutions will remain exposed to changes in Microsoft's licensing terms. A significant number of institutions have elected to install alternative solutions in server/network operating systems and server-based applications. Linux's rising user acceptance could fuel these changes.
- There will be campus constellations which between them have very different levels in information systems development and sophistication that is a consequence of historical and geographical disadvantage (Letseka,2001). Where there are one or more institutions in a merger each bringing with them fairly well developed information systems, the challenge of integration must be informed by a decision regarding which pre-existing campus system will be taken as the benchmark for planning. This may turn out to be a more difficult strategic problem to resolve than other instances where systems in some campuses are so un-developed that it is possible to design a new system from the ground up. The decision can be further complicated where there is substantial IT competence among personnel distributed unevenly between several campus units.
- The decision was made to create a new institutional form, the "comprehensive institutions" through merging universities and Technikons. Mergers at the intersectoral level (between a University and a Technikon) may engender more challenges than intrasectoral mergers (eg: between two universities) (Patterson,2001,6).
- The evaluation of information system investments is an essential precursor to planning, and should not be taken to mean merely obtaining an inventory (or due-diligence report) of the existing hardware and software systems. It is necessary to quantify the full value of systems that include the human skills base in the form of experienced information systems staff.
- The construction of information systems in the newly merged systems must also take into account how they will facilitate the uploading of data into the Higher Education Information Management System (HEMIS). This presents an opportunity to renovate systems at this level as deemed necessary.

INFORMATION SYSTEMS AND THE CONSTRUCTION OF LEARNING INFRASTRUCTURE

There are key generic areas of operation in which information systems play a role across most higher education institutions, and some of these are: course development and design, hosting and disseminating courseware, student services, academic staff administration, research, library services, facilities management, marketing, community engagement, and management information.

For the sake of this analysis, the contribution of information systems to higher education delivery can separated into two main activities:

- support of higher education curriculum or programme delivery
- support of higher education management and administrative functions

In the past, the higher education information systems requirements were defined largely in terms of internal business processes. Now we are seeing the shape of these systems being determined to a large extent by the outward focus on ICT based learning platforms. For this reason, the section that follows will undertake an analysis of the challenges for curriculum and programme delivery in a merger situation.

Lest this paper be misconstrued as uncritically technofile and technicist in orientation, the following critical assumptions concerning the use of technologies in higher education learning infrastructures underly the discussion that follows. It is observed that ICT can support a learning process that is discursive, adaptive, interactive, reflective (Laurillard cited in Scholtz and Lovshin,2001,3) and adequately contextualised. However, there are clear challenges:

- "the use of information technology does not of itself improve learning."(Alexander,2001,243-244)
- successful e-learning takes place within a complex system, composed of many inter-related parts, where failure of only one part of that system can cause the entire initiative to fail"(Alexander, 2001, 240-241).
- from the point of view of learning as quintessentially a social activity, the use of technology cannot substitute for face-to-face contact with lecturers and with other students, and there are limits to how information systems can mediate such interaction
- there are logistical and other challenges associated with the roll-out of online delivery including: system reliability (Hannah,1998,17); access bottlenecks from poor local connectivity services outside of the institution's control; and variation in the sophistication of clients whose competencies are likely to affect their own perceptions of the value of the programmes for which they are registered.

INFORMATION TECHNOLOGY INFRASTRUCTURE SUPPORTING THE PROVISION OF BLENDED AND COLLABORATIVE LEARNING

The application of information and telecommunications technologies presents opportunities for flexible learning based on collaboration and the blending of online and face to face interaction. This implies having the technical capacity to provide services equivalent with 4th and 5th generation distance education modes (DETYA,2001). However, the capacity to deliver such programmes must be complemented by the capacity to create them. The aim in this section is to provide an overview of the different elements that will usually be identified in a fully fledged learning technology system.

In higher education, there is a set of software systems that together will support the provision of learning experiences either in part or wholly by electronic means. The functionality required of a system of the kind suitable for installation by a higher education institution will be spread across a number of products or tools and vendors. These systems must be integratable by supporting open standards and ensuring interoperability across heterogeneous platforms systems and environments.– which can represent a substantial investment - is directly influenced by prior decisions regarding the shape of the information system of the institution. The challenges for the integration of information systems discussed earlier will directly impact on learning technology acquisition – from the inside out as it were. As important is to recognise that decisions about learning technologies must be informed – from the outside in - by the institutional strategy for curriculum planning based on an assessment of who and where the target student populations are and what knowledge and programme areas will be presented.

The environment in which courseware is created is difficult to describe, because even though there is a tendency for vendors to focus on their core competencies, many of the products do not precisely respect each others domain of functionality. The core set of systems involved are described in Figure 1 below.

Figure 1: Learning technology infrastructure
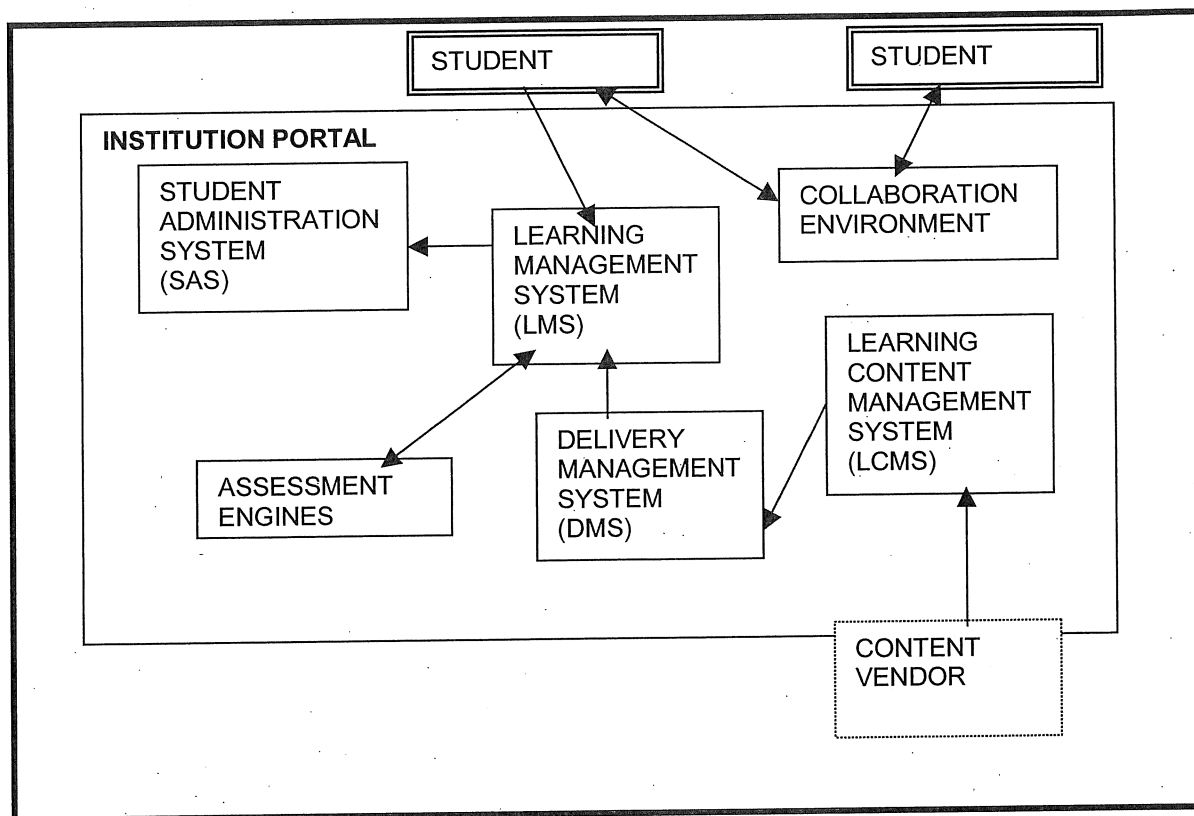
- The learning management system (LMS) manages the learning environment providing a place where content can be organized, catalogued and presented to learners, learning plans can be managed and where learning activities can be tracked and assessed. It will have a connection to a delivery environment for delivery of learning content eg: click2learn, Docent, Thinq and IBM Mindspan Solutions
- The student administration system (SMS) manages learner registration, planning and learner profiles eg: PeopleSoft, SCT, DataTel
- Delivery Management System: (DMS) manages the content assembly, interacts with authoring tools and supports learning delivery eg: WebCT or Blackboard
- Learning Content Management System (LCMS) is an environment where learning developers can create (author), store, reuse, manage and deliver digital learning content. Eg: Trivantis, Macromedia products, StarOffice, PowerPoint
- Collaboration Environment (CE) is an environment in which students can interact in an asynchronous mode outside of the more structured systems noted above. Eg: Centra, Webex, Placeware and Interwise (Collier,2002,10-13)

This is not only a technical issue, but requires an understanding of the bigger strategic picture within which learning programme development must take place. A major obstacle to designing and developing programmes for online communities is the large development times associated with these activities (Edling,2000,10; Alexander,2001,245-246). The main resource allocation of the institution to the costs of developing online learning programmes lies in academic/faculty time, which can easily range from the hundreds of hours over a year into thousands of hours over a longer course development process (Hannah,1998,15). Despite the calls for greater integration of ICT into higher education curricula, academics have been slow to respond. Institutions expect academics to do more with technology, but do not incentivize the process. Many institutions have IT support centres and some have instructional

support centres. But the formal mechanisms for academic recognition privilege research output rather than the quality of an academic's commitment to implementing ICT based courseware.

THE ENVIRONMENT WITHIN WHICH BLENDED AND COLLABORATIVE LEARNING WILL BE OFFERED

Before the merger process, South African higher education institutions had advanced to various stages of sophistication in the development of their online presence and their capacity to support learning. This produced an emerging segmentation of the higher education market based on the patterns of physical and online access among registered students. The reconfigured institutional shape of higher education in South Africa presents new opportunities and challenges for newly merged institutions to consider how to obtain an optimal pattern of delivery of learning opportunities. It remains to be seen how competitive this environment will be. What follows is an attempt to identify the main drivers causing higher education institutions to invest in learning technologies for the purpose of providing blended and collaborative learning.

Institutions will seek the capacity to develop online learning opportunities for a several reasons:
- As a means of adding value to their face-to-face courses (eg: online course information and materials, online library access)
- As a means of offering blended courseware
- As a means of providing collaborative learning opportunities in programmes
- As a means of offering distance education.

But the motives identified above do not take account of the competitive dimension. Yetton (1997 cited in McCann,1998,11) argues that information technologies produce opportunities for higher education institutions to differentiate themselves in at least four strategic dimensions:
- Value added strategy where the 'traditional' or the 'elite' university uses ICT to enrich the value of its existing programmes on offer
- Cost based strategy (mass market) where a younger university uses ICT to develop and deliver a focused – restricted – range of programmes to a mass market
- Cost based strategy (niche market) to focus on niche market alternative therapies visual and performing arts and business colleges
- Hybridised strategy which involves using ICT to create a powerful standardized infrastructure for devolved educational programme which are flexible and distributed through several channels

Each new merged institution will have to critically assess its capability to roll out the preferred strategy. The analysis will have to take into account the following layers:
- The geographical reach of populations which can physically access one or more of the constituent campuses (either on a full-time or on a part time basis)
- The distribution of curriculum programmes between the constituent campuses
- The compatibility of similar curriculum programmes between formerly different campuses
- The extent to which face-to-face curriculum programmes are (a) complemented by existing online blended and collaborative learning resources, or (b) replicated in a fully online version

This analysis is important since some degree of curriculum rationalization may be necessary between different campuses in each of the newly merged institutions. Each campus – as a former independent institution - will have a historically unique set of programme offerings and a spatially limited range within which it can draw students.

None of these spatial challenges will affect a programme which is offered entirely the Internet, which is not geographically bound. Unfortunately, this does not apply on the other side of the relationship where prospective students do not have either computer, telecomms or Internet access. It is not possible in the constraints of this paper to address the complexities of competition between higher education institutions based on pure internet delivered courseware. Our concern is rather with considering how the new merged institutions will maximize their reach within the framework of a blended learning approach.

Those merged institutions which prefer to offer blended learning opportunities, will confront clear spatial limitations on their ability to access student populations even where their campuses are widely dispersed. However, they can

achieve greater reach through improved articulation of learning pathways in agreement with other institutions. They can consider collaborating with other institutions in reciprocal relationships in which access to each others capacity is brought together in combination (eg: one merged institution can offer face-to-face contact while a partner institution can provide online support or vice versa). There will be considerable complexities in brining together online courseware from one institution and face to face lectures and tutorials from another (eg: curriculum differences, quality assurance, coordination) not least of all the negotiation of financial rewards from such an agreement. Related to the possible evolution of such shared programme developments, is how the HEQC/CHE will deal with accreditation of higher education programmes.

Based on this analysis, it is clear that a number of mission strategic decisions must be made in order for the newly merged institutions to properly plan and implement their learning management systems. These include crucial decisions on:
- The balance of emphasis between face-to-face, blended and online learning
- Which part of the segmented market for higher education services in South Africa to focus on
- Whether to engage in alliances with other public or private institutions to achieve further reach

The creation of new merged campus constellations in a context of unequal access to information systems and learning technology infrastructures, together with different interpretations of the strategic mission of the institution may contribute in the long term to inequitable access to higher education opportunities and provision of education of varying quality. Therefore, the creation of a set of rules for ensuring access to information technology resources may be advisable.

COSTS
In order to support the merger process, R800million (US$114million) was set aside within the governments Medium Term Expenditure Framework, for disbursement mainly for re-capitalisation of undercapitalized institutions, personnel retrenchment costs, harmonizing systems and for physical infrastructure (Department of Finance, 2003). Presumably, information technology system funds will be bundled under more than one of these categories. But there may be some room for concern about the ultimate information system costs of mergers.

It is likely that the constituent campuses in each merger will bring very different contributions to the table for the design of the merged information system and the learning system that will be placed on top. The Institutional Landscape Document was not so detailed that it gave explicit consideration to balancing the information system capacity between each merged institution. An audit of such capacity in each constellation of campuses prior to merger would reveal that some institutions have a clear advantage in terms of their inherited information systems and personnel capacity. To ensure that the outcome of the mergers does not disadvantage any institution in respect of its information systems development – and by corollary its ability to roll-out important online capacity - the Department of Education may elect to specify certain minimum standards that can be used as a base for budget allocations on information systems.

The Institutional Landscape document states that the National Education Department will cover the direct financial costs to "ensure that the merged institutions are financially sustainable (Department of Education,2002,35). It is the related ongoing costs that cannot be known fully in advance that may threaten sustainability. Ongoing upgrading and service costs of information systems will be determined by the level of ambition of current information technology plans. For example, an institution which elects to focus more intensely on online courseware is likely to have a much more substantial need for investment in learning technology infrastructures and learning management systems than an institution which aims to work mainly in the contact mode. This raises critical questions regarding the process of allocating budgets and resources between institutions which have taken on different – but equally important – strategic imperatives.

The implementation of ICT in higher education institutions has created important challenges for the management of expenditures and the management of costs. ICT has shown itself to be continuously transformational and disruptive (Kaludis and Stine,2001,49) – on account of the expanding power and utility of hardware and software systems. This suggests that high infrastructure costs should not be viewed as an investment because there is a constant need for upgrading. Furthermore, the cost of instructional technology must be measured as a part of the whole process and not as a stand alone cost. As a consequence, institutions must find ways of absorbing expansion costs on an ongoing basis. This raises important financial sustainability considerations which must be taken into account at two levels. First, the Education Department should not be expected to fund information systems and learning technology plans which are not deemed sustainable. Second, in the long term institutions may be forced to absorb costs (through

additional fund raising), to embed costs in overall fees, or to levy IT fees. The latter two options may prove disadvantageous to students who cannot afford such levies.

CONCLUDING REMARKS

The discussion in this paper emphasises that the fundamental question underlying the acquisition and development of information systems and learning technology systems is not only technical but also strategic in nature.

The costing of ICT based curriculum development is difficult on account of the inability of standard accounting mechanisms to establish – or accurately measure – costs that are allocated to the development and support of teaching (McCann et al,1998,7). This means that strategic decisions must not be supported solely by accounting/economic information.

In mergers, the setting of time-scales and budgets must be converted into commitments. Jansen et al (2002,31) warn that framing and working on a post merger strategy with a clear set of institutional outcomes is extremely important - otherwise, institutions become bogged down as interim plans become institutionalized and become costly to undo or reverse.

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Programme
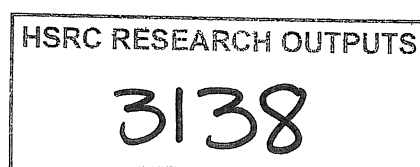
e/merge 2004 takes place over 2 weeks, from Monday 28 June to Saturday 10 July. Presentations have been grouped into four themes: The Big Picture, Case Studies, Learning Communities and Learning Environments.

Presentation and discussion of papers in each theme will take place over 3 days. Workshops will each run for an entire week.

1. The Big Picture

Mon 28 June to Wed 30 June

Keynote: Going Global, Locally: Geographically Distributed Collaborative Learning Environments for Studies of Globalisation and the Information Society	Derrick L. Cogburn, *School of Information and Center for Afroamerican and African Studies, University of Michigan*
Towards appropriate methodologies to research interactive learning: Using a design experiment to assess a learning programme for complex thinking development	Jean Botha, Duan van der Westhuizen and Estelle De Swardt, *Rand Afrikaans University*
Activity theory as a potential framework for technology research in an unequal terrain.	Joanne Hardman, *School of Education University of Cape Town*
Do Students Learn in Collaborative Consultation? A Speech Act Theory Perspective of Dynamic Frequently Asked Questions	Dick Ng'ambi, *Multimedia Education Group, University of Cape Town*
A conceptual framework of access to educational technologies	Laura Czerniewicz and Cheryl Brown, *Multimedia Education Group, University of Cape Town*
A Pedagogical and Economic critique of student charges for Internet access	Duncan Greaves, *Tertiary Education Network*
Information systems and institutional mergers in South African higher education	Andrew Paterson, *HSRC*

2. Case Studies across the Region

Wed 30 June to Fri 2 July

Global eQuality: Lessons from NetTel@Africa	Maria Beebe, *Centre for Bridging the Digital Divide*
Online debating to encourage student participation in online learning communities: A case study in the Education Department of Rhodes University	Cheryl Hodgkinson and Markus Mostert, *Rhodes University*
Blended online and face-to-face learning – a pilot project in Faculty of Education,	Xavier Muianga, *Faculty of Education*

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Presentation

Information systems and institutional mergers in South African higher education

Andrew Paterson Human Resources Development Research Programme, Human Sciences Research Council

The period within which higher education mergers have taken place on a large scale internationally overlaps with a phase characterized by extremely rapid take-up of information technologies in higher education. This article analyses the implications of institutional mergers for information systems development in the South African higher education system.

The analysis is undertaken with particular reference to the new institutional shape as envisaged in the higher education merger plan, and with reference to the characteristics of current higher education information systems. This article will draw attention to the key decisions that can positively influence the outcome of information systems integration in higher education mergers. Particular emphasis is given to the importance of information systems as more than mere technological infrastructure that can contribute to long term sustainability in higher education institutions which are quintessentially knowledge based organisations.

This article asks how the shape of the South African higher education merger plan, and the current characteristics and capacities of information systems in institutions in that country will influence the effective integration of the information systems. The article alludes to the centrality of information systems for higher education, outlines the policy on mergers in South Africa, and discusses the key implications of mergers for information systems in South African higher education.