Establishing a New University Information Systems and Technology School: The Relationship between IS&T, BIS and IM

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Abstract

Very few have the opportunity in their careers to be in at the start up of a new university department – even fewer when this is brought about by the formation of a new university. The development of the University of KwaZulu-Natal campuses in January 2004 is such a development funded by a range of sources. This development has led to the formation of a 'new' School of Information Systems and Technology (IS&T). The question raised is "What is Information Systems and Technology?" This has been considered in some detail by other authors (e.g. Neville & Brayshaw, 1996) but everyone has to ask the question, in their own context, when planning a contribution to the development of the subject. In any event, university management quickly want the question answered in the form of detailed development plans for research and course provision.

This paper begins by giving a short history of the development of Information Systems and Technology at the university, also the nature of the changes taking place in the organisation. A definition of IS is developed by extending the discussion raised by Tully in his paper for the 1st UKAIS Conference (1996) (as *cited* by Neville & Brayshaw (1996)) on the associations between IS and other areas of study in related fields. The paper concludes by raising a number of general considerations all those developing the subject Information Systems and Technology should be wary of if a clear identity is to emerge for the subject area.

Keywords

Computer Science, Information Systems, Information Systems and Technology, Merger, Mission, Systems Sciences, Vision

Introduction

The Merger of the Universities of Durban-Westville and Natal

The Universities of Natal and Durban-Westville have merged on 1 January 2004. This was because the Department of Education had decided to reduce the number of tertiary institutions. The new merged institution has been renamed the University of KwaZulu-Natal. This name was decided on after consultation with all parties during 2003.

Background to the Merger

Ten years after new democracy in South Africa, the Higher Educational system is still affected by the legacy of a lack of multi-cultural approaches that does not take all factors (e.g. the apartheid years, etc.) into account. Despite internal and piecemeal restructuring efforts by individual institutions, the sector as a whole continues to experience poor human capital production levels, fragmentation along race lines, a lack of sustainability and a structural incapacity to meet the challenges of reconstruction and development. On 9 December 2002, the Minister of Education, Professor Kader Asmal, announced a series of mergers to be implemented as a means of addressing the structural problems affecting Higher Education in South Africa. (The Merger of the Universities of Durban-Westville and Natal:

(www.nu.ac.za/department/data/merger.pdf)

The New Institution

The merger between the universities of Natal and Durban-Westville is among a series of mergers in the tertiary education scene to take place in South Africa.

Some mergers on the card and suggested name changes are:

- RAU & Wits Technikon ➔ University of Johannesburg
- Peninsular Technikon & Cape Technikon ➔ CPUT
- UPE & PE Technikon ➔ Nelson Mandela Metropolitan University
- Some universities not affected by this are:
- UCT
- Wits
- Stellenbosch

As such, it heralds a new era for Higher Education in South Africa, offering an opportunity, recognised by both institutions, to create a South African institution based on academic excellence, critical engagement and demographic representivity. In both culture and form, the new university will be designed to meet the challenges of serving the country and the region in innovative and effective ways. It will be a world-class institution and an active global player while still serving the KwaZulu-Natal and Southern African region.

Vision and Mission of the University of KwaZulu-Natal

To be the premier university of African scholarship

(http://www.ukzn.ac.za/aboutus/mission.asp)

A truly South African university that is academically excellent, innovative in research, critically engaged with society and demographically representative, redressing the disadvantages, inequities and imbalances of the past.

By combining the strengths of both institutions, the new university will be in a position to offer:

- A wider range of academic programmes, across five campuses in KwaZulu- Natal;

- A diverse complement of highly specialized staff and academic experts;
- An institutional ethos and environment to support the intellectual, professional and personal
- development of both students and staff;
- Extensive facilities for all sporting, cultural and academic activities;
- An opportunity to be a part of the transformation of Higher Education in South Africa.
- (http://www.ukzn.ac.za/aboutus/mission.asp)

The leaders of this institution share a vision of an institution that will facilitate the highest levels of teaching, research and community service with the potential to become one of the of South Africa's leading research and innovation centres. It is envisaged that commerce will be placed at the Westville Campus in 2007.

The School of Information Systems and Technology

The School of IS&T at the Pietermaritzburg and Westville campuses belong to the Faculty of Science, while at the Howard College campus it is housed in the Faculty of Commerce. It has been agreed at all three campuses that Information Systems and Technology for the new university will belong to the Faculty of Commerce (see figure 2).

Previously the IS&T module was called Business Information Systems (BIS) at the former University of Natal. During the merger talks in 2003 it was decided to use a generic term IS&T for all three campuses.

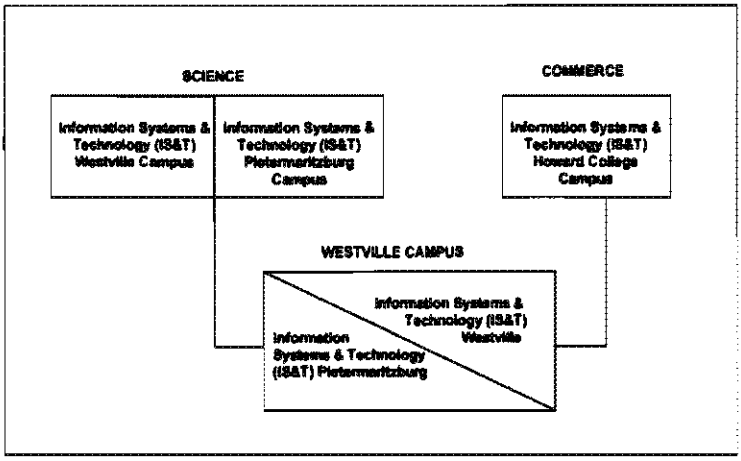

Figure 1: Department of Information Systems and Technology

What is Information Systems and Technology?

Tully as *cited* by Neville and Brayshaw (1996) in his address to the first UK Academy for Information Systems conference raised the position of the Discipline of IS as having relevance to a number of existing research areas. First it has its origins in Information Technology where the supporting hardware/software facilities to animate IS design were developed. The second, Systems Thinking, where some of the underlying organisational and human aspects have been discussed. He also makes reference generically to other areas which have contributed skills, techniques, and ideas all relevant to the development of Information Systems as a discipline. In his paper the authors discuss IS in relation to IT/Computer Science and Systems Thinking and argue why it merits separate from other disciplines. This theme was of central im-

portance to much of the discussions which took place at the first UKAIS Conference held at Cranfield University in 1996. Acknowledging its roots in other disciplines, and indeed their continuing influence upon future developments, we seek to highlight distinguishing features which set IS apart from more well established subject disciplines. A definition of what an information system is:

> *The study of information systems and their development is a multi-disciplinary subject and addresses the range of strategic, managerial and operational activities involved in the gathering, processing, distributing, and the use of information and its associated technologies in society and organisations.*

(Defined by the UK Academy for Information Systems as *cited* by Neville & Brayshaw, 1996)

O'Leary & O'Leary (2004) defines an information system as a "collection of hardware, software, people, data, and procedures that work together to provide information essential to running an organisation" and information technology(IT) as "computer systems, large or microcomputers, that provide understanding to the end user."

According to Whitten, Bentley & Dittman (2004) an information system (IS) as an arrangement of people, data, processes, and information technology that interact to collect, process, store, and provide as output the information needed to support an organisation. According to the same authors information technology (IT) is a contemporary term that describes the combination of computer technology (hardware and software) with telecommunications technology (data, image, and voice networks). For the purpose of this study the first definition will be used.

Central Issues in Delineating Information Systems

Communities currently live in an increasingly information rich world. People are all information users – and must be able to make use

of the facilities offered by government and industry. With the Internet increasingly being used in academia and industry, users now have access to a massive variety of information, images, sounds, and video. It is thus of importance to look for ways of making information accessible and usable, and this involves addressing fundamental problems in searching, navigation, and dealing with information load and complexity. There would seem little point in storing amounts of information if users are unaware of this information existence or whereabouts, or lack the appropriate toolset to retrieve and use that data.

Changing the Agenda of Human Computer Interfaces

Next is the manner of interacting with information systems, how do people design for information access in the new age? Some old approaches for information retrieval may still be appropriate in given sets of instances, but humans are now at the dawn of an era when they use their imaginations and experiment with new ideas about what information is and how humans are to interact with it. With the advent of total immersion Virtual Reality new possibilities open. However, even using new data visualization techniques, people have new ways of exploring and presenting data. Thus HCI shifts to a more visionary approach of designing for the future-not just optimizing the present.

Some Fundamental Problems

Central to issues of designing information spaces are a series of fundamental issues.

These are listed below:

- Conceptualisation – what model of the information system is appropriate for users to have in their head?
- Navigation – seeing the wood for the trees. In particular knowing what's out there and where you are.
- Searching – sorting the wheat from the chaff.
- Interaction – how are users to interact with the information space available to them? What types of toolset are appropriate to enable the previous three activities?

- Appropriateness – what types of models are appropriate for which set of tasks and what sort of users?
- Adaptability/flexibility – to what extent is it necessary or desirable to allow users to modify their ability to interact with the information systems or the conceptual model behind it.

There are a series of possible ways of designing information spaces to explicitly deal with these issues.

Why Information Systems?

There have now emerged application areas where computers are being used as information servers, often for vast quantities of data. For the reasons outlined above, if their use is to be maximized for potential users then fundamental obstacles have to be overcome. For a user base that can frequently comprise more relatively unskilled or casual users, it is important to study and identify ways to maximize their use of our information reserves. Structure is also an important issue, and when one looks at Management Information Systems, not just the information itself needs to be considered, but issues concerning strategic planning, and frequently the type and nature of the business itself. For all these reasons their now seems to emerge a specialized related area which requires treatment in its own right in the light of the unique set of obstacles and challenges that academics now face.

By studying information systems as a distinct entity academia can thus identify and offer generic solutions to many of the fundamental problems that we now face. It is timely and important that academics now do so. The UKAIS was formed by a small group of IS experts who have recognised this need for a distinct area. Without this distinct recognition of a new discipline it becomes increasingly difficult for IS research as a traditional demarcations for funding in the UK Research Councils and Research Assessment Exercise hide IS in with computing. The result is that research which is more directed away from hard systems development paradigms has to seek funding from other bodies

which would tend to classify IS as computing. Many find themselves trapped in a situation where they have no clear profession/academic/funding body to represent them – hence the drive for the formation of the UKAIS. So they are purely pragmatic (as well as academic) arguments which require the clear identity of IS to be established. (Neville & Brayshaw, 1996).

Why not Systems Sciences?

Information Science is the study and development of artifacts; including the development process and management role. System ideas are of direct relevance to the process of development. There have been many attempts to formalise software design approaches (e.g. Whitten *et al.,* 2004). Some of these have been harder approaches, made from an engineering perspective. Others, taking a more socio-technical systems, focus more on process than being by technological determinism. Whilst it clearly is that case that this means that system sciences have an important role to play in IS development; the precise methods by which this takes place are still relatively unclear. Thus whilst system sciences are relevant, it is still a research question about how to formulate these processes in the IS context and thus deserves consideration in its own right.

Why not Computer Science?

For Information System (IS), computers are just a convenient form of delivery. People can conceive that IS does not require machines (e.g. the card indexes of old libraries). As a tool, computers do impact on the implementation of information systems but the area of study is in structure and use of the information, the application layer, and not on the other layers of technology that might underpin this. Thus the computer is interesting in terms of functionality it allows the user to exhibit at an application layer, but in itself is not the focus of attention. An IS may need to incorporate different data centres, corporate system, management systems, marketing systems, manufacturing systems, as well as other information service providers. Its concerns

are not limited to those software sciences alone. It thus represents a sizeable application area in its own right and one that deserves explicit treatment. A counter to the above might be to ask 'ah yes, but aren't all software systems information systems, even if the information is just ones and noughts'. The answer to this is yes and no. The goal of the software is often something different, for example solving complex mathematical equations. This is distinct from IS where the explicit point about their existence is to provide an information service. There is however a grey area where things may overlap. An example is scientific visualisation where scientific data (e.g. chemical structure) is replayed back to the scientists via visual models. Here indeed is a case of a scientific software system that is also to some extent an information system. It is to be hoped that many of the ideas contained in these systems can be integrated with general models of information systems, not least when the user wish to display complex scientific data.

Opportunities Provided by Information Sciences

Information Systems, as the name implies, are systems in their own right. However they may differ from other systems in their content, structure, plasticity, and in their virtual makeup. The information can come in a wide variety of forms, for example pictures, video, sound, text, in various formats e.g. video conference, virtual reality, hypertext, and from diverse sources e.g. internal or external networks, hard disks, databases, CD's or the Internet. There is also more to Information Systems than just the raw provision of the desired information. Users are now capable of building up new experiences for users which are unlike anything we have encountered before. For example, physical presence is no longer a prerequisite for many activities, so students can now attend virtual universities (EISE 1996), people can surf around virtual libraries and museums, or even be virtual tourists (e.g. http://www.paris.org) . These new experiences may also be shared with other users, or software posing as other users. Such software may include artificial intelligences that interact or even collaborate with users when they use an information system (e.g. Whitten *et*

al., 2004). These interactions can take place using conventional communication channels e.g. email, phone, synchronous or asynchronous conferencing, or video conferencing, or they could take place in a shared environment like a virtual reality meeting room or office. However users are not limited to basing shared experiences on some software copy of the world as already experienced, but are able to dream up new conceptual structures appropriate to given tasks and goals. An example of such a created reality is a data network like cyberspace (O'Leary & O'Leary, 2004) which is often described as a shared hallucination whereby users perceive as real an information space populated by people, AI's, and large organisations. All these concepts are new and challenging ideas which push us to new limits in such questions as:

- How we access and use machines?
- How we behave as people?
- How we interact with a world which can increasingly be moulded by ourselves?
- How we interact with other people?
- How we perceive seemingly intelligent agents we meet?
- How all this is used and integrated into the society and our existing organisational structures?

The implications and repercussions that information systems are going to have make it important that they are considered explicitly under a separate banner headline. Many of the things that we have to consider challenge assumptions under which traditional disciplines have laboured. The move towards virtual world means that many hard constraints are now soft.

Conclusion

In this paper the authors have argued that information systems deserve to be treated as a separate related discipline. Within the term

information systems they have included a large number of different emerging technologies all with some information bearing/bearing content. They think this is justifiable because these rapid changes, and indeed the emergence of totally novel (and sometimes unforeseen) technologies, mean that conventional label sets should not be strictly applied. Rather at this stage it is better to stand back and see what emerges, and be inclusive in definitions rather than exclusive.

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