



An analysis of the current and future deployment of Information Systems and Technology at the University of the Western Cape

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Summary

In order to successfully deploy information technology and information systems, any organisation must have a strategy indicating where its business is going, an understanding of the information systems that will help to deliver that strategy, and the capability to deliver and exploit those information systems.

It is commonly believed that UWC does not have a strategy (although we acknowledge that a draft document has been tabled at Senate since the main stage of this study concluded). There are relentless pressures to change the way that we work at UWC. Strategies will be needed at institutional and faculty levels, and new information systems will be required to support them.

Much of our recent investment has been in information *technology* as much as it has been in information *systems* and *services*. These things are different, and it is the systems and services that deliver the benefits of an investment, not the technology.

There is widespread disappointment in the general level of service delivered by IT Services at UWC, although this might be a direct result of a failure to invest adequately; we must note that campus network performance has improved significantly over recent months. The level of investment in IT at UWC has been indicated to be as high as 5-6% of organisational expenditure. This needs to be verified: if it is the case then we are *not* benefiting appropriately, when compared to other tertiary or to other information intensive businesses. The case of the ITS package gives rise to particular concern. The benefits that it will deliver are not understood, nor has the early experience been satisfactory.

The ability of the organisation at large to exploit new information systems has also been challenged. We must not presume that the acquisition of new technologies and new systems will solve our problems. Many problems will only be solved when those of us working at UWC understand the essential business *processes* that we service through our work. We also need the requisite competencies to *use* new information systems effectively.

The UWC mission statement informs our discussion about the need for new information systems. It highlights the need for information systems that will help us to communicate with the world (such as our web site), to manage our quality (management information systems) and the growth of our students (teaching and learning), to address diversity (through the effective use of learning systems that will equalize learning opportunities) and to help the nation at large come to terms with the challenges of national transformation (by studying effective information management in society, and by educating people in government, in business and in our communities about it).

An analysis of our strengths and weaknesses shows that the latter prevail: in the area of IT services we are especially weak according to the opinions expressed to us in this study. The current portfolio of information systems applications is sparse except in the area of support systems; this means that we are not using information systems effectively to develop our organisational processes and improve our competitive position. The few innovative applications that we have found are interesting however, and should be encouraged. IT resources (especially those provided for students) are generally under-managed and they are not contributing to our primary business of education to the extent that is expected.

An analysis of our opportunities reveals a significant number of new ideas for applications that will promote innovation and enable strategic developments. The ideas that are presented here would, if implemented, help to balance our portfolio of information systems investments. They would help to implement new organisational strategies (when they are finally agreed) and redress the limited contribution offered by the current portfolio. A further analysis of the ways in which these new applications might contribute to the work that we do shows a rich variety of benefits.

However these benefits will not deliver themselves. There is a great deal of work to do if we are to reap them, and the investment of management time and the organisation of the required management effort might well be the greatest problem.

Recommendations

Despite the absence of an agreed institutional strategy, this study leads to some recommendations that are preparatory to the implementation of a strategy when it is available:

- The analysis of organisational activities should be reviewed, developed and negotiated until we have a stable and agreed model of what we are all doing (*see Section 5 and in particular the figure that presents a model of key UWC activities and processes*).
- The solicitation of ideas for new information systems should be widened in order to gain the fullest appreciation of the potential benefits (*see Section 4, and Section 4.3 in particular*).
- The balance of benefits from investment in academic as opposed to administrative systems needs to be investigated and negotiated further (*this is a pervasive issue*).
- The actual contribution of the ITS package to the needs and opportunities identified here needs to be critically assessed. If it is not a useful contribution then we should seek another approach to the improvement of our administrative and academic work (*see Section 1 and Section 4*).
- The ability of the organisation to achieve improvement, adaptation and change needs to be understood and managed (*this is a pervasive issue*).
- The means whereby we will fulfil the management challenge (see Section 6) must be discussed and agreed:
 - Business strategy must be formulated and promulgated.
 - The strategy must be implemented.
 - Business processes must be managed.
 - Information systems must be implemented.
 - Information systems and technology must be acquired.
 - Infrastructure must be managed

Without an agreed definition and allocation of management responsibilities, the whole institutional strategy (not just our information systems strategy) will be put at risk.

Applications portfolio

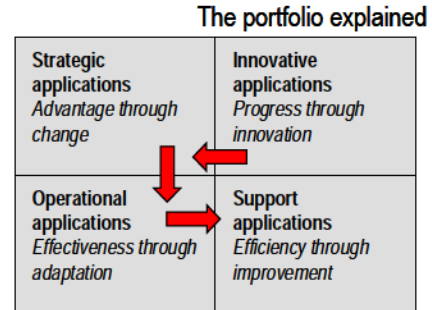
On the page following there is a summary of the information systems applications that have been identified by this study. They are organized into:

- The current portfolio of applications
- A possible future portfolio of applications

The portfolio model is also explained by a brief legend that shows how *innovative* applications progress so as to become *strategic*, at which point an organisation must accept the need to change; when strategic systems become used universally they become *operational* and an organisation must then adapt to what has become – in effect – universal good practice within the industry or sector in question. Finally, *support* applications whilst not critical do offer efficiency through simple improvement to current practices.

This sense of change, adaptation and improvement provides a useful link between the results of this study and the draft UWC Strategic Plan (21st November 2000)

<p>Strategic applications</p> <ul style="list-style-type: none"> • Aleph library system <p>Current applications portfolio</p>	<p>Innovative applications</p> <ul style="list-style-type: none"> • Web based teaching & learning (KEWL) • UWC Intranet • Law faculty database (Jutastat) • Management information system
<p>Operational applications</p> <ul style="list-style-type: none"> • Marks administration • Exams administration • Financial management • Library services • Electronic Mail services • Network management 	<p>Support applications</p> <ul style="list-style-type: none"> • IT Services help desk system • Telephone management system • Inventory system • Stores and purchasing • Personnel management • Payroll and leave administration • Transport services • Virus protection • Personal Internet usage • Personal productivity software



<p>Strategic applications</p> <ul style="list-style-type: none"> • Web based student recruitment • Web based student placement • Web based student registration • Online student information services • Multimedia course development support • Web supported teaching and learning (KEWL) • Web supported assignment and assessment system • Improved Internet access • Faculty managed systems • Teaching systems • Quality management system • Knowledge repositories • Contact management system 	<p>Innovative applications</p> <ul style="list-style-type: none"> • Video conferencing for lecturing and tutorials • Virtual campus • Web based student recruitment • UWC Intranet • Law faculty database (Jutastat) <p>Future applications portfolio</p>
<p>Operational applications</p> <ul style="list-style-type: none"> • Student network logon, authentication and management • Student print services • Internet usage monitoring and management • Resource (lecture rooms, audio visual) booking system • PC Laboratory booking system • UWC Web site • Management information system • Marks administration • Exams administration • Financial management • Aleph library system • Library services (catalogues and online databases) • Electronic Mail services • Network management 	<p>Support applications</p> <ul style="list-style-type: none"> • IT Services problem management system • Virtual notice boards • Virtual brochures • IT Services help desk system • Telephone management system • General ledger and budgetary control • Stores and purchasing • Inventory system • Personnel management • Payroll and leave administration • Transport services • Virus protection • Personal Internet usage • Personal productivity software

A portfolio analysis of information systems applications at UWC

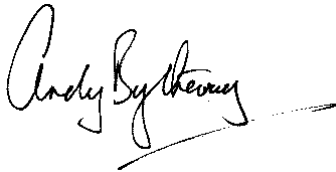
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Comments please

Comments on this report are welcome. They will be noted and communicated onwards. Please send them to the author at abytheway@uwc.ac.za



Andy Bytheway
11th December 2000

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1 Introduction and commentary

1.1 Background

Following a short investigation of the use of information technology and systems at UWC undertaken by a consulting company earlier in the year, it was agreed to invite senior Information Systems students to undertake a more detailed study. The course dealing with the techniques for such a study (IS321) concluded on 20th November 2000 and student reports have been submitted that report their findings under three broad headings:

- **Strategy:** What is the university's strategy, and how do information technologies and information systems support it?
- **Supply:** What do we do to provide the hardware, software and systems that the institution needs?
- **Exploitation:** How good are we at exploiting the investment in information technology and systems?

The information presented here was elicited through interviews, questionnaires and by means of a public appeal to the whole university community to submit comments and ideas. This report presents a consolidated view of the findings. The first section summarises the findings under the three headings indicated above. The sections that follow present a more detailed view of the findings and are based on the detail contained within the student reports.

The reader should bear in mind that much of what is reported is based on perceptions elicited through interviews and questionnaires. Rather than giving a definitive statement of the situation, it gives a snap shot of current feelings and attitudes. It provides a baseline for further specific actions to deal with the perceived problems and opportunities.

1.2 Strategy

What is the institutional strategy?

There is a majority view that the University of the Western Cape does not have an institutional strategy¹. There also seems to be no strategy for the deployment of information technology and information systems, but this is an inevitable consequence in any business that has no higher level organizational strategy.

The university needs a strategy because there are relentless forces for change. We cannot presume that we will even survive as an institution without adapting to new circumstances. There is much evidence of inefficiency and ineffective working in the university. There is the prospect of reduced income (specifically subsidy income) and we are faced with increased costs.

The role of Information Technology

Information technology could play a very large part in our future, but it does not necessarily have to be the determinant of that future. We are in a "knowledge" business and we are reliant on information as the manifestation of our knowledge. The world will judge us by the way in which we manage information as well as by other means. But we must not assume that expenditure on

¹ As this report was being compiled, the Draft Strategic Plan (2001-2005) dated 21st November was made available to Senate and although it is still a draft, some of its high-level content has been incorporated here – see the later sections of this report.

new information technology will solve our problems. Unless we have an associated programme of *business process* change, technology-induced change will merely exacerbate our problems.

In the absence of an institutional strategy faculties have been developing independent views of their opportunities and how they might be realized at the faculty level. This is not necessarily a bad thing but it does put at risk the benefits of economies of scale. If we do not manage the implementation of strategy carefully our institutional infrastructure will become more expensive to maintain. It follows that our institutional future might be driven more by faculty strategies, supported by a simplified institutional infrastructure that preserves economies of scale where ever possible. This will be especially important to our successful and effective use of information technology infrastructure as well as other more familiar infrastructural elements.

Academic use of Information Technology for strategic purposes

There is evidence that new academic uses of information technology are emerging, although many people struggle to understand what the academic use of IT actually might be². There is a very simple explanation: academic applications of IT support some (or all) academic activity. For example: curriculum planning and design, the development of learning material, the automated delivery of learning and its assessment, and the management of students and their marks. The recent availability of KEWL (the web-based learning environment under development by Professor Derek Keats and his team) has found a small but ready academic audience and has stimulated discussion at UWC about web based and constructivist learning. This is a good example of an academic application of IT.

The support of research activity might also be included in the definition of academic computing, but there is no universal view about systems that might support research apart from the obvious role of the library.

Improvement, adaptation, or change?

This study has identified a wide range of potential applications of information technology, too many to list in this introductory section (see the detail that follows later). The question arises, which opportunities should we grasp first, and which might we choose to put on one side because they offer only limited benefits?

As explained in the draft UWC Strategic Plan (21st November 2000), we can choose to ***improve*** what we do now, we can choose to ***adapt*** what we do now to new circumstances, or we can choose to ***change*** what we do. This gives us a strong indication of how we should proceed with new information systems. Some will simply improve what we do now, some will require adaptation of current practices, and some will necessitate significant change. Where we aim for change, a strategic approach to management is needed; indeed, strong, committed and determined management will be needed to achieve change. Where we aim only to improve or adapt, then line management and individual staff members should be able to embrace new information systems and their benefits without senior management persuasion.

Early experience with the ITS package has reminded us how difficult change can be.

² Or rather, re-emerging – many people are unaware that in the 1980s UWC had one of the very few computer based learning systems – PLATO – an early example of computer based learning originally from Control Data Corporation. Little evidence of this capability remains today.

1.3 Supply

Level of investment in IT

There is widespread disappointment in UWC at the level of recent institutional investment in information technology and in the quality of support services provided by our Information Technology Services Department (referred to here as “IT Services”). This pattern of disappointment is to be found in many organisations, whether in the commercial world, public administration, or academe. Satisfaction with information technology departments and service providers is the exception rather than the rule.

It is said that we are currently investing about 5-6% of our institutional budget in information technology and related things³. Typically, a commercial organisation might invest as little as 1% (in the case of a simple business) to 8% (in the case of an information intensive business such as a bank or insurance company). Clearly, we are a knowledge and information intensive business, so 5-6% should be an appropriate and effective level of investment. We must therefore pay due regard to how the money is spent and whether we are effectively deriving the expected level of benefit. CapeTech and PenTech are reported to also spend about 5% of the institutional budget on IT, but seem at first sight to derive a higher level of benefit.

Information systems and services

There is a range of information *systems* in place in the university, focused almost solely on administrative activities. There are also different related *services*, such as internet connection and help desk support, that are more widely used.

The general pattern is of fragmented development and a “bottom up” approach. “*Where we are today a consequence of how we got here, rather than where we wanted to be*” is an adage that comes to mind. Until recently there seems to have been no real effort to discuss and agree where we *do* actually want to be, especially in regard to information systems and services. Marks administration systems used in departments are ad hoc and not subject to any central control; finance systems are not integrated with the budgeting process; HR systems are not integrated with faculty administration; timetabling is not integrated with room allocation. And so on.

On the basis that a large number of other institutions have chosen to use it, we decided some time ago to commit to the acquisition and deployment of the “ITS” (Integrated Tertiary Software) package, not to be confused with our IT Services department.

The Integrated Tertiary Software package

The decision to acquire the ITS package was not subject to wide discussion with potentially affected parties. It is not clear how much business analysis has been undertaken to investigate its applicability to UWC’s needs. There has been little communication to the wider community about its capabilities and the potential benefits to the university. This reinforces a general feeling that effective communications between IT Services and the university at large are virtually non-existent. This bodes ill for the success of the ITS package project. There is a very real prospect that the investment will deliver few real benefits. History tells us very clearly that where users and management are not involved from the start, and where there is no clear organisational commitment, projects that attempt to implement such large and potentially complex systems frequently fail.

³ This must be verified – this is almost certainly an over-estimate

1.4 Exploitation

The idea that an organisation needs to be able to exploit an investment in information technology is an obvious one, but often one finds that people are unwilling or unable to make the most of the opportunity. Rather, as just indicated, investments in IT frequently fail to deliver any benefits and are not effectively exploited. It is a matter of understanding and agreeing the benefits of a new system right at the start, and then making sure that those benefits are delivered. This is not a job for IT specialists, it is a job for the business. Organisational competency to use and exploit information systems is the critical issue, not the technology nor even the software package that purportedly renders information technology useful.

Perhaps that is why there is evident concern about the prospects for the success of the ITS package – the benefits are not clear. Acquiring the package because most other tertiary institutions have it is only half an argument – if we do not really understand the benefits that these other institutions gained (and did they gain any at all?) then what chance is there that we will benefit also? And have we made any effort to assess the potential benefits against our actual needs?

There are wider questions about the willingness of the university to move forwards and adapt to modern times with new systems. The culture of the institution is to revel in its past rather than to move nimbly and quickly to a bright new future. The structures of the university make any substantive change to working procedures or resources a nightmare of argument and persuasion, and the track record for achieving and implementing major decisions in recent years is very poor.

Further, there is the question of the level of capability amongst individual staff to work with computer systems, to understand the critical issue of data accuracy, and to subjugate organisational structure to the need for effective processing and progression of our business affairs. Although a small number of people are striving to innovate, both administratively and academically, the evidence is that the majority are less willing. Perhaps our ability to exploit the benefits of the ITS package will be the first test. Initial experience with the HR module is not encouraging, and we need to learn from this experience and make plans that recognise what we have learnt.

1.5 The Mission Statement

The University of the Western Cape is a national university, alert to its African and international context as it strives to be a place of quality, a place to grow. It is committed to excellence in teaching, learning and research, to nurturing the cultural diversity of South Africa, and to responding in critical and creative ways to the needs of a society in transition. Drawing on its proud experience in the liberation struggle, the university is aware of a distinctive academic role in helping to build an equitable and dynamic society.

When we wonder which way we need to turn our argument, the mission statement for the university should guide us. The words of the mission statement are helpful, and indicate some of the considerations for future information systems as follows:

- It is natural that our **context** should concern us, and we must make every effort to accommodate the needs of our nation and to work with others in the continent of Africa and in the world. It is difficult to imagine how globalisation might affect our future but it is going to be critical for UWC to find a niche within which we can work globally, and within which we can develop an international as well as a national reputation. Despite some successes there is a long way to go yet.

The effective use of information technology to network around the world and to build our presence and reputation is obviously important. But we do not yet present our ideas and working papers to the world in electronic formats. The UWC web site is predicated more on faculties and academic departments than on projects and initiatives that are interesting and meaningful to the outside world. We have to learn to balance the need to nurture our academic subject areas – the internal view – with the need to present our work to the outside world according to its needs – the external view. Internal information systems will be a key factor in achieving the successful administration of multidisciplinary teams and their projects but a whole new layer of thinking and institutional practice is required if we are to bring our communications up to world standards. At the same time, we must find ways to preserve and proclaim our African origins.

- We claim to be a **place of quality and a place to grow**, and yet we have no real quality management system that assures quality, and how do we actually demonstrate that our students are actually growing to their fullest potential? There are at present no institutional mechanisms to promote and encourage the growth of the institution itself, as all units that are struggling to grow know to their cost. The idea of “areas of concentration” is an important starting point but yet needs to be realised.
- Our commitment to **excellence in teaching, learning and research** also demands that we evaluate the results of our efforts, and even that we benchmark them against others in the same business. There are effective techniques for assessing organisational performance but we do not invoke them. We may indeed be as good as the best but there is no analysis that informs us about this. In order that we undertake such an analysis, we need information that we may do not have within our current information systems. Research is an exception here: our ranking (by total NRF funding received) is indicative of our success and has been proclaimed.
- **Cultural diversity** is both a problem and an opportunity. It is a problem through variety in language and in the meaning that we attribute to words. It is a problem because with different cultural backgrounds we have different expectations of ourselves and of the institution. But, it is an opportunity because technology should help us to deal with multi-lingual approaches to teaching and learning. It is an opportunity because if we solve the problems, we will be able to offer our solutions to the world and establish a reputation thereby.
- No one living in South African needs to be reminded that a **society in transition** faces huge dilemmas and challenges. One way to achieve change is to use a strict project management regime and an organised approach to the sharing and dissemination of management information about change. But informing the whole of society about change is problematical. Understanding the extent of change requires monitoring and measurement systems. UWC has a unique opportunity to build on its history of supporting the *struggle* for change through the study and promulgation of techniques and tools that will successfully *achieve* change. The whole world is interested in change. Few countries (and few universities) have the opportunity to study it in such depth and at such close quarters as we do. Information technology and information systems will be part of this story of change when it is finally told.
- Many would argue that South African society is not significantly more **equitable and dynamic** than it was six or seven years ago. Some would argue that it has regressed. Just as UWC became famous for its critical commentary on the previous dispensation, so it could choose to comment on the new dispensation. Part of this new commentary could easily be based on innovative information management techniques for public administration, using modern information systems and technologies to garner data, to analyse it, and to promulgate

the results. We have the opportunity to work with national and local government in this important area.

The balance of problem and opportunity is always there before us. It is up to us to tip things in favour of opportunity. No one will do it for us.

2 Approach to the analysis

Dealing with information systems and technology investments is generally seen as difficult. Some of the best organisations in the world have real problems in understanding how to relate the cost of technology to the benefits that management seeks to gain from it.

This analysis investigates the forces for change at UWC, discusses the current situation with regard to information technology and systems at the university, assembles evidence about targets that we could set ourselves, and concludes by noting some of the things that we need to do to move forwards. Our analysis conforms to a simple view of what strategy is⁴:

Strategy is: knowing where you are now, knowing where you want to be at some point in the future, and having a rough idea how to get there.

2.1 Forces for change

Tertiary institutions face considerable forces for change. There is a relentless pressure to move towards a more “business like” model for organising and managing universities and technikons, matched in some institutions by an equal unwillingness to do so.

There is serious competition from different sources. Overseas universities are making strong overtures to our potential applicants. Private colleges offer shorter, sharper routes to employment. Even large multinational companies (for example the global software provider Oracle) have established their own “universities”, thereby redefining the very meaning of the word and confusing prospective students.

The changing quality of schooling in South Africa and the falling number of matriculants has caused us to introduce non-exempted students; there is a critical need to be able to monitor their progress and assure the success of this initiative.

Budgets are hard pressed. Government subsidies have been reducing and the university carries a historical student debt. Student numbers have reduced and although student debt is now not increasing and student numbers are going up again, albeit marginally, we are faced with reducing income from traditional sources for several years to come. We need to develop alternative revenue streams, whether by aggressively seeking new funds from donors or by developing products and services that have real value in the eyes of local and overseas “markets”.

The effectiveness of the institution is in question. There is widespread dissatisfaction and frustration with the quality of supporting services in UWC, and there is confusion about academic workloads and resourcing levels. Students have grievances and there is no obvious mechanism to deal with them – a place of quality must have a quality management system. At UWC we do not. Growth opportunities are clearly evident but the structures of the university make any kind of timely response difficult, if not impossible.

In the world at large there is rapidly rising interest in the use of the World Wide Web for educational purposes. It proves to be an effective vehicle (some people argue) for the delivery of learning materials, the management of the learning process, and the assessment of learning. However, there is no universal agreement about this⁵. Most of us at UWC still need to explore

⁴ Taken from the IS321 “Information Management” course notes

⁵ There have been some interesting recent articles about this in the Mail and Guardian: two cautionary: “Massive political will is needed to ensure distance learning can perform its vital roles”

and understand more clearly the benefits and risks of distance learning that relies on the web – it is very likely that a compromise (computer *supported* learning not computer *based* learning?) will be the most appropriate.

We must find the means to encourage and support innovation, for example through establishing and developing liaisons with emerging bodies of influence, such as the Black Management Forum. We need to understand the success (or difficulty) that our students achieve in their careers and to respond to it. If we are to succeed with Life Long Learning we need to track and service the needs of alumni. All of these things imply a need for new information systems that will facilitate and support improvements in the way that we work. Communications are problematic for many organisations. UWC is no exception.

It has been said in the course of these investigations that we are faced by a threat to our very survival. All the evidence confirms that we do indeed face substantial, systemic difficulties that will pull the institution down if we do not understand and act upon the need for change. Investments in information technology and systems will not solve all our problems, but they are an inevitable and critical factor in achieving the successful change that will ensure our survival.

2.2 The need for a strategy

The way that organizations deal with change is to negotiate and adopt a strategy that will allow the organization to react constructively, and to make the best of the opportunities that present themselves. The widely held perception within UWC is that we have not had an institutional strategy.

Faculties are evolving their own approach to their own problems and opportunities and – whilst this is not necessarily a bad thing – there is the risk that we lose any economies of scale that we currently enjoy. It is common for a large complex business to devolve strategies to business units. The term “strategic business unit” is common parlance in business, and it is an idea that the university could choose to adopt. It would support the current mood for faculties to assume more control over their own affairs. It might also facilitate the development of other areas of activity outside of faculties, such as research institutes and schools. Because institutes and schools are able to face the market, and (in principle at least) to draw on any academic discipline in order to meet the market, they are going to be critical to the future academic and financial success of the institution. They must be seen as separate business units, and they must be allowed to have their own strategies.

The adoption of strategies at the business unit level leaves a question about the institution as a whole. Consideration of the mission statement and our recent history suggests that the overall guiding strategy for the university could be to focus on researching, documenting and educating in the area of *national transformation*. Few countries are enjoying the degree of transformation that we see before us in South Africa, and few institutions in South Africa are as well qualified as UWC to undertake this task. This would synergise well with our objective to offer equitable access and to offer responsive and focused academic activities and services. There is only limited evidence that other tertiaries are addressing this specific opportunity.

(<http://www.mg.co.za/mg/za/archive/2000nov/features/22nov-brave.html>)

“The majority of local institutions offering distance education have little expertise”

(<http://www.mg.co.za/mg/za/archive/2000nov/features/22nov-student.html>),

but one rather more optimistic:

“Large numbers of students who might otherwise not benefit from tertiary education are reached by distance learning programmes”

(<http://www.mg.co.za/mg/za/archive/2000nov/features/22nov-cousin.html>)

2.3 Some comments on the approach to IT at other institutions

Interviews with managers in other local tertiary institutions (and publicly available evidence) suggest that some of these others have clearer and more committed strategies than we do. The IT manager at Peninsula Technikon affirms that there he has strong and effective senior management support for IT, and his whole approach to our questions was pitched at the strategic rather than the operational level. But this is not the case everywhere else. At UCT there is evidence of a problematic disconnection between institutional planning and the investment in information technology. We have no evidence (in this investigation) about the situation at Stellenbosch, although their home-grown administration systems are reputed to be capable and effective. Moreover, they are available to (and used by) other tertiary institutions.

On a national and worldwide basis, the available documentation on information technology strategies at educational institutions suggests that most such institutions around the world struggle to understand the difference between information technology and information systems. We must not make the same mistake. Information *technology* comprises the boxes and cables (and operating system software and communications equipment) that drives *costs*; an information *system* is the combination of all these things *together with trained and willing people, and appropriate business procedures*. It is the information system that delivers *benefits*, not the technology.

With all of this in mind, we now need to address the questions “*where are we now?*”, “*where do we want to be?*” and “*how shall we get there?*”.

3 Where are we now?

At present things are very fragmented. As noted, we have not had the benefit of an institutional strategy although a position is now emerging. IT Services are seen as weak and ineffective, although the improvement to the campus network is one success story.

In the notes below we summarise our findings under the headings:

- **Internal strengths**
- **Internal weaknesses**
- **Current portfolio of information systems**
- **Current portfolio of information technology resources**

3.1 Internal strengths

Whilst we have some strengths the general picture is of weakness (see below). Where we have strengths, they are often frustrated by inadequacies elsewhere, for example we have the potential to grow but no mechanism for growth. We have a unique identity from the apartheid years but this will not serve to take us forwards into the future.

Organisational strengths

- UWC is active in the communities – we are the first choice for some people from rural and other communities.
- We have part time offerings.
- There is a unique identity deriving from UWC's role in the apartheid years.
- We have some pockets of excellence from which we could grow – especially in research.
- We have some innovative courses that help to redefine our role in the marketplace.
- We have a potential for growth.
- We have foreign liaisons with overseas institutions.
- We offer low cost options relative to other institutions.

Information systems and technologies strengths

- Campus networking is good.
- There are potentially useful initiatives, for example the Multimedia laboratory and the KEWL web-supported learning environment.
- The enthusiasm of the current TLTU (acting) director was noted by more than one person as a strength.

3.2 Internal weaknesses

The organisational weaknesses identified below are hardly a surprise to anyone who has been working for innovation and effective use of IT at UWC. The extensive list of weaknesses with IT Services is a matter of concern. But, we must remember that we are dealing with perceptions here, these are simply the concerns expressed by those who were interviewed for the purposes of the investigation. The overwhelming evidence is that we suffer from serious weaknesses in the management of IT services, but we should take care before coming to any simple or hurried conclusions.

Organisational weaknesses

- No mechanism to manage growth.
- Poor library resources, especially in regard to electronic journals and bibliographic services.

- Under-investment in research.
- No quality management (for example student evaluations are not always analysed).
- The organisational vision is of information *technology*, not information *systems*.
- Perceived as of lower quality than UCT and Stellenbosch.
- Excessive reliance on the historical role and reputation of the institution.
- Lack of funds for the academic use of information technology.
- An unwillingness to charge students for PC Laboratory usage, even through registration fees.

Information systems and technologies weaknesses

- Ineffective existing systems, especially budgeting and financial management systems.
- IT Services are under-funded (but this needs checking – if it is 5-6% as indicated in the investigation then this would be about average for institutions of our type).
- IT Services are not defined and generally are not the subject of service level agreements. For example, IT Services will purchase equipment for a department, but there is no guarantee as to how long it will take. They will fix a broken PC, but there is no reliable indication of turnaround time.
- A helpdesk management system is in place, but we see no statistics as to how many queries have been processed in a period, how many are still outstanding, and how long they took, whether things are getting better.
- Services are susceptible to staff holidays and sometimes come to a complete halt when staff are away.
- The allocation of the IT budget to different institutional activities is unclear. “Networking, Communications, Administration, Management information all 16.25%; Helpdesk 35%” – this tells us nothing about the contribution to our different activities, processes and projects.
- Systems are outdated, and there is no mechanism to establish users’ requirements and deliver solutions. There is no periodic survey of user needs.
- There is a vicious cycle of “not talking to each other” between IT Services and users – for example the student email system was launched but most students were unaware of it and it was not “marketed” to them. ITS say that academics are unable to articulate their needs and requirements, academics say that ITS never listen to their complaints.
- There are few standards and inadequate policies and procedures. For example, MS Office is now the standard for desktop software, but many users are still unaware of this and are using the Corel suite.
- IT Services sometimes unilaterally and without consultation remove services (for example free email services such as Hotmail), causing serious disruption to academic work.
- There is a commitment to outsourcing that contrasts with other institutions that are dedicated to maintaining their own development capability – outsourcing inhibits our potential to make strategic use of information technology and systems. It should reduce costs but there is no guarantee that it will do so without close and tenacious management of outsourcing contracts.
- No systems development service is offered by IT Services – rather there is a limited reactive service based upon short term requirements from time to time (for example for new management reports).
- There is no project management discipline and IT Services activities routinely fail to meet deadlines.
- Where IT Services do get involved with user systems there are difficulties. For example the Jutastat database from the Law faculty was vested with ITS but then withdrawn. The faculty now operate the system themselves.

- The ITS package has not been evaluated for its fit to our information systems needs – most academics and many administrators are not aware of its capabilities and potential to improve things.
- We do not seem to encourage the employment of our own students in IT Services – other institutions make extensive use of graduates.
- There is no quality management system evident in ITS.
- The initial attempt to implement the HR module (from the ITS Package) failed. This was blamed on a lack of support from academics (users?).
- UWC is seen as lagging behind the other tertiaries except in specific academic applications (eg NetLab).
- There is poor and largely undefined support provided to student labs and a consequent loss of reliable services to students.

3.3 The current portfolio of information systems

In making a judgment about the level of investment in information technology and information systems, it is important to understand the different kinds of information systems that are in place and whether or not they are actually making a contribution.

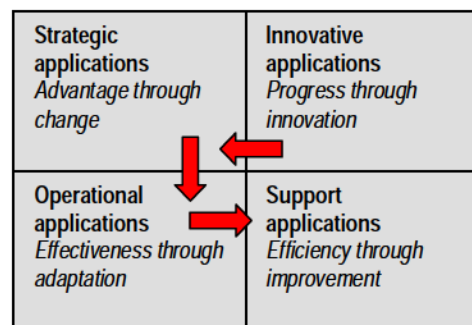
Definition of terms

It is unhelpful to talk about the “administration system”, the “mainframe system”, the “Oracle system” or the “ITS system” – we need to know what these systems actually do and which organizational activities are facilitated by them. Is the “administration system” handling student registrations, or not? Does the “Oracle system” contain data about motor vehicles? Better to talk about the *student registration system* and the *vehicle management system*.

This we attempt to do here. Further, in this discussion we shall refer to information systems as “applications” – this helps to remind us that we need to understand how information technology is *applied* and *why*, rather than that it simply exists. The tabulations that follow list all the applications that became evident in the course of the investigation. They are organized into four groups that we define as follows (and that can be loosely related to the draft UWC Strategic Plan – Section 4 page 8 – as indicated in the notes below):

- **Support applications**

Supporting applications are non critical but they help to facilitate administration and fulfill statutory requirements (for example). Generic, low cost solutions are appropriate. These applications need to be in place, but the organisation would not cease to function if they were sometimes not available for some reason. There is no potential to distinguish ourselves as an institution at this level (but if we consistently do these things badly then we would distinguish ourselves for the wrong reasons of course).



New support applications would probably be associated with “improvement”, in the terms of the draft UWC Strategic Plan.

- **Operational applications**

Some applications are so obviously important (to all faculties and all departments) that we depend on them for routine operational reasons. If they failed in any way, then the operation

of the institution would be jeopardised and operations might even come to a halt. Any university needs to be able to do these things effectively to be a viable institution: without these systems we would not qualify as a viable “player” in the tertiary education market.

New operational applications would probably be associated with “adaptation”, in the terms of the draft UWC Strategic Plan.

- **Strategic applications**

Some applications can be termed strategic because they promise to deliver real substantive change and concomitant benefits (but only where this promise has been discussed and agreed – an idea that is understood by only one person is *not* strategic). A strategic application makes an organisation distinct from its competition and differentiates it from others.

New strategic applications would probably be associated with “change”, in the terms of the draft UWC Strategic Plan.

- **Innovative applications**

There are a few applications that could be termed “innovative”, in that a few enthusiastic individuals champion them. They are not widely understood (yet) and they have not been agreed to be strategic (yet), but they have the potential to contribute to future success and need to be managed as such. There sometimes seems to be little encouragement to innovate at UWC.

The draft UWC Strategic Plan does not explicitly feature innovation in its discussion of the impetus for strategic planning.

It will be seen below that the largest single group of information systems is in the support category. The university must decide whether this is what is wanted. If we are to progress we *must* invest in innovative and strategic applications in order to build a competitive future.

Innovative applications

- Web based teaching and learning (KEWL)
- UWC Intranet
- Law faculty database (Jutastat)
- Management information system

Strategic applications

- Aleph library system

Operational applications

- Marks administration
- Exams administration
- Financial management
- Library services (catalogues and online databases)
- Electronic Mail services
- Network management

Support applications

- IT Services help desk system
- Telephone management system
- Inventory system
- Stores and purchasing

- Personnel management
- Payroll and leave administration
- Transport services
- Virus protection
- Personal Internet usage
- Personal productivity software

3.4 The current portfolio of information technology resources

A breakdown of IT resource *by its area of application* was not available, but there is clearly a preference to invest in information technology for *administration* rather than for *academic* activities. There is a presumption that donors will provide for academic systems, but when donor-funded equipment is installed there is no budget to maintain it and IT Services is unwilling to support it (possibly for good reasons, in those cases where they were not involved in the acquisition).

There is no certainty how many computers there are on the campus available to students. One estimate (TLTU) is that there are 753 PCs available to students; another (IT Services) is that there are only 500. The higher estimate represents one PC for every 16 students – this is generally agreed to be inadequate. We should aim for 1:10 (that would require 1000 PCs) – 1:5 would be ideal.

We identified relatively little evidence that administrative computing was a problem (although should they be asked more directly administrative staff might say otherwise, especially those involved in the ITS HR Module implementation) but there were many comments about the student labs:

- Lab management is weak and the quality of service is low.
- Opening times are limited – 24 hour access is required.
- Printing facilities are inadequate.
- More than half students use the PC Labs daily – but more than half of their daily use is to browse the Internet. Only 4% of their usage time is for tutorials (they say).
- More support is needed for part time students, and for staff working late with part time students.
- The quality of internet service is extremely poor and little has been done to effectively improve it. Students get a very poor impression about the usefulness and accessibility of the Internet. Although it can be said that much internet usage is personal (and in the case of students probably frivolous) there is a reluctance to agree to any form of censorship. There may be agreement on the idea of rationing, however. One consequence of the shortage of bandwidth is that people are simply bringing in modems and using the telephone lines to connect through an external Internet Service Provider.

The question of Internet services could be seen as the touchstone of our current problems. By one enquiry we are reported to have less than one thirtieth of the bandwidth of the Wits campus but we have a comparable number of students (about two thirds as many). In comparison with international universities we are orders of magnitude short of bandwidth. If we are to make any progress into the future world of web supported learning this problem will simply *have* to be addressed.

So, where do we actually want to be in the future?

4 Where do we want to be?

In the absence of an agreed institutional strategy it is not possible to build a single picture of the future that we could, or should, be aiming for. Some pointers came up in the course of this investigation: first we summarise the opportunities that were evident in the detail of this investigation, then the threats. Where there was an opinion about new or improved information systems that are needed, these are also listed below. Finally, here we also provide an analysis of the implications of the draft UWC Strategic Plan dated 21st November 2000. Thus, the sections that follow deal with:

- **External environment – opportunities**
- **External environment – threats**
- **Future portfolio**
- **The draft UWC strategic plan**

4.1 External environment – opportunities

Few organisational opportunities were identified in our enquiries. One has to work harder with the whole body of evidence to draw out the real opportunities. There is a slightly more positive picture in the future portfolio of information systems applications which follows below, and which was drawn from our conversations and enquiries.

Organisational opportunities

- To capitalise on transformation-related research, consulting and education.
- To orient ourselves to a “real world” approach to curriculum design, teaching, learning, and research.
- To more effectively embrace the enthusiasm and energy of students and use it to further the development and improvement of the institution.
- To drop the “historically black” image of UWC and compete squarely on the basis of academic quality and value-added to students.
- To work our partnerships more effectively, especially the international ones.

Information systems and technologies opportunities

- To improve organisational performance through the effective deployment of IT.
- To support and encourage the KEWL initiative.

4.2 External environment – threats

In the threats we see a reflection of the opportunities. For example, the emergence of web based education services can be seen as a threat, but we have our own project at hand that could turn it into a real opportunity. The emergence of foreign universities is a threat, yet we have more than 30 formalised working liaisons, so why can we not turn them into an opportunity that could match the best that the “solo” foreign universities are offering?

Organisational threats

- The rise of the private educational institution and the emergence in the South African market of foreign institutions and proprietary “universities” (such as Oracle University).
- The emergence of technology-based education products and services.
- Falling supply of suitable candidates and falling pass rates.
- AIDs as a threat to applicant numbers, and as a dissuasion to even apply to UWC (where 1 in 5 students are reported to be HIV positive).

- Further reductions in Government spending.
- Failure of the current school system to qualify candidates.

4.2.1 *Information systems and technologies*

- Inadequate progress with technical infrastructure in comparison with other local tertiarities.
- A failure to meet the operational standards required by national government, if our internal systems are not up to scratch.
- A failure to meet expected quality standards through a lack of a quality management system, especially if we continue publicly to claim to be a place of quality.

4.3 **Future portfolio**

There was less evidence of future system requirements than one might have hoped. Most people seemed to have more to say about the problems with existing systems than about future possibilities. However there were some ideas that emerged in the investigation. In general terms:

- We need more aggressive and effective financial management systems, especially for cost management. If we are short of funds and cash flow is a problem then we must avail ourselves of information systems that will assist us to manage expenditure effectively at all levels, from budgetary planning to general ledger analysis and cost management. The current systems are not effective.
- We need to provide more effective support to learning and teaching through student tracking and monitoring systems, coupled with specific student support where it is needed. We must make students more welcome and bring them information services to go with their learning and other activities.
- If we are truly to be a place of quality we must have an effective quality management system. We must assess students and teachers, and we must assess the assessment system.
- There is interest in online web-supported learning and teaching, but there is no clear understanding how to make the most of these ideas and how to validate the new pedagogy (if there is to be one). It is likely that because of our mission to serve the needs of the community we will have to preserve some face-to-face contact and that we teach people to use web-based learning systems before we allow them to do so.

The proposal to deploy the ITS package has very poor visibility amongst the university community. Few people are aware of it and even fewer understand the benefits that this kind of investment could bring. This is to be regretted, as experience tells us that this ensures that implementation will be difficult and that organisational performance might even be undermined rather than improved.

Other application ideas did emerge, and the whole set of future applications from which we could prioritise and choose is listed below. The new future applications are listed here in **bold text**. Note that these are *additional* to the current portfolio tabulated above, that are repeated here in plain text. Some are re-categorised (for example, the Aleph library system and the Management Information System, that have both now been categorized as operational).

The same categories are used again.

Innovative applications

- **Video conferencing for lecturing and tutorials**
- **Virtual campus**
- **Web based student recruitment**

- UWC Intranet
- Law faculty database (Jutastat)

Strategic applications

- **Web based student recruitment**
- **Web based student placement**
- **Web based student registration**
- **Online student information services (including student histories)**
- **Multimedia course development support**
- **Web supported teaching and learning (KEWL)**
- **Web supported assignment and assessment system**
- **Improved Internet access**
- **Faculty managed systems**
- **Teaching systems**
- **Quality management system**
- **Knowledge repositories**
- **Contact management system**

Operational applications

- **Student network logon, authentication and management**
- **Student print services**
- **Internet usage monitoring and management**
- **Resource (lecture rooms, audio visual) booking system**
- **PC Laboratory booking system**
- **UWC Web site**
- Management information system
- Marks administration
- Exams administration
- Financial management
- Aleph library system
- Library services (catalogues and online databases)
- Electronic Mail services
- Network management

Support applications

- **IT Services problem management system**
- **Virtual notice boards**
- **Virtual brochures**
- IT Services help desk system
- Telephone management system
- General ledger and budgetary control
- Stores and purchasing
- Inventory system
- Personnel management
- Payroll and leave administration
- Transport services
- Virus protection
- Personal Internet usage

- Personal productivity software

A note on the ITS (Integrated Tertiary Software) package

At first sight, the ITS package provides a rich array of modules that would deal with many of our administrative needs. The ITS web site (<http://www.its.co.za>) provides good summary detail of the modules:

- Contact system
- Student system (see below for sub-modules in the student system)
- Student finance
- Research Administration
- Library system
- Central reservation system
- Card system (security)
- Personnel system
- Building space inventory
- Assets inventory
- Stores inventory
- Finance system
- Costing system
- Payroll system
- Institutional research (Management Information System)

Several of these break down into sub-modules. For example the student system comprises:

- Academic structure
- Enquiries
- Application and selection
- Registration
- Study records
- Lecturing timetable
- Exam timetable
- Alumni
- Co-operative education
- Clinic system

In all there are 55 modules. See the appendices for a diagram that summarises the structure of the package and the linkages between the modules. It is clear that this variety of functionality could go some way to providing the new applications that we desire. The question as to whether we have other options than to implement the ITS package may need to be re-visited.

4.4 The Draft UWC Strategic Plan (21st November 2000)

This draft document is helpful. It gives clear direction to our thinking although it does yet not go so far as to indicate in specific terms where we should aim to be at some point in the future. There are objectives, actions and target outcomes, but no suggestion as to how far, or how deeply, we should attempt to change and with what priorities.

The seven key areas for action that it identifies are as follows:

- Teaching and learning
- Research and research development
- Leadership, management and governance

- HR management and equity planning
- Enrolment management and student development
- Financial planning and income diversification
- Communications and marketing

Teaching and learning

The draft plan does not feature the use of information technology or systems in our teaching and learning, and yet that clearly is one of our opportunities. This might be because over-riding questions about what to teach suppress questions about how to teach it, but we must address the “how” question if we are to be credible in the future world of tertiary education.

The plan does lay repeated stress on the question of learning *needs* at the national, social and learner levels, and that is after all where everything starts. Perhaps if we understand these needs properly we will see more clearly which modes of teaching and learning are the most appropriate. Do we understand the needs?

The opportunity with computer based (or computer supported) learning is to separate teaching and learning. Rather than being in a classroom with students, the teacher can be remote in geographic terms, separate in chronological terms, and yet still more accessible to every student.

Research and research development

The information needs of researchers (and research teams) will vary. It is possible that there will be generic requirements for survey and analysis tools for example, but most researchers seem to instinctively choose to go their own way. This might be the most appropriate approach. However, the management of the overall research effort and the co-ordination of applications for grants and funding requests could benefit from a central repository of information.

The results of our academic research at UWC – working papers and research notes – could usefully be made available electronically via the university web site. A more innovative proposal would be to explore the potential to manage the *knowledge* that is ours, from the Mayibuye centre right through to the cutting research in science and elsewhere.

Leadership, management and governance

The need for effective information systems to support management is self-evident. Managers simply do not have the information that we need to take effective decisions. The management information/enquiry system developed and championed by Vincent Morta is precisely what we require, but it will fail without access to totally reliable data from other operational systems.

HR management and equity planning

With the attention that we must now pay to equity planning we have to ask what systems might help us there. Following the first attempt to implement the ITS HR module this might lead more quickly to the question whether we can implement new systems, for example because of poor existing data and poor attitudes to the need to change. In our enquiries we found little evidence about any critical need for new HR systems.

Enrolment management and student development

Registration time is without doubt the most visible manifestation of our inadequate systems. Students are relentlessly sent from one queue to another in a seemingly endless paper chase. In the draft strategic plan there is the objective to improve student administration but it is a short reference and it belies the problems that we might face in achieving effective enrolment systems. Given the nature of our target student population, it is particularly important that we address these inadequacies and incorporate new registration systems in the wider domain of life long learning.

It is surprising that the obvious need for new administrative systems to support life long learning has not been recognized.

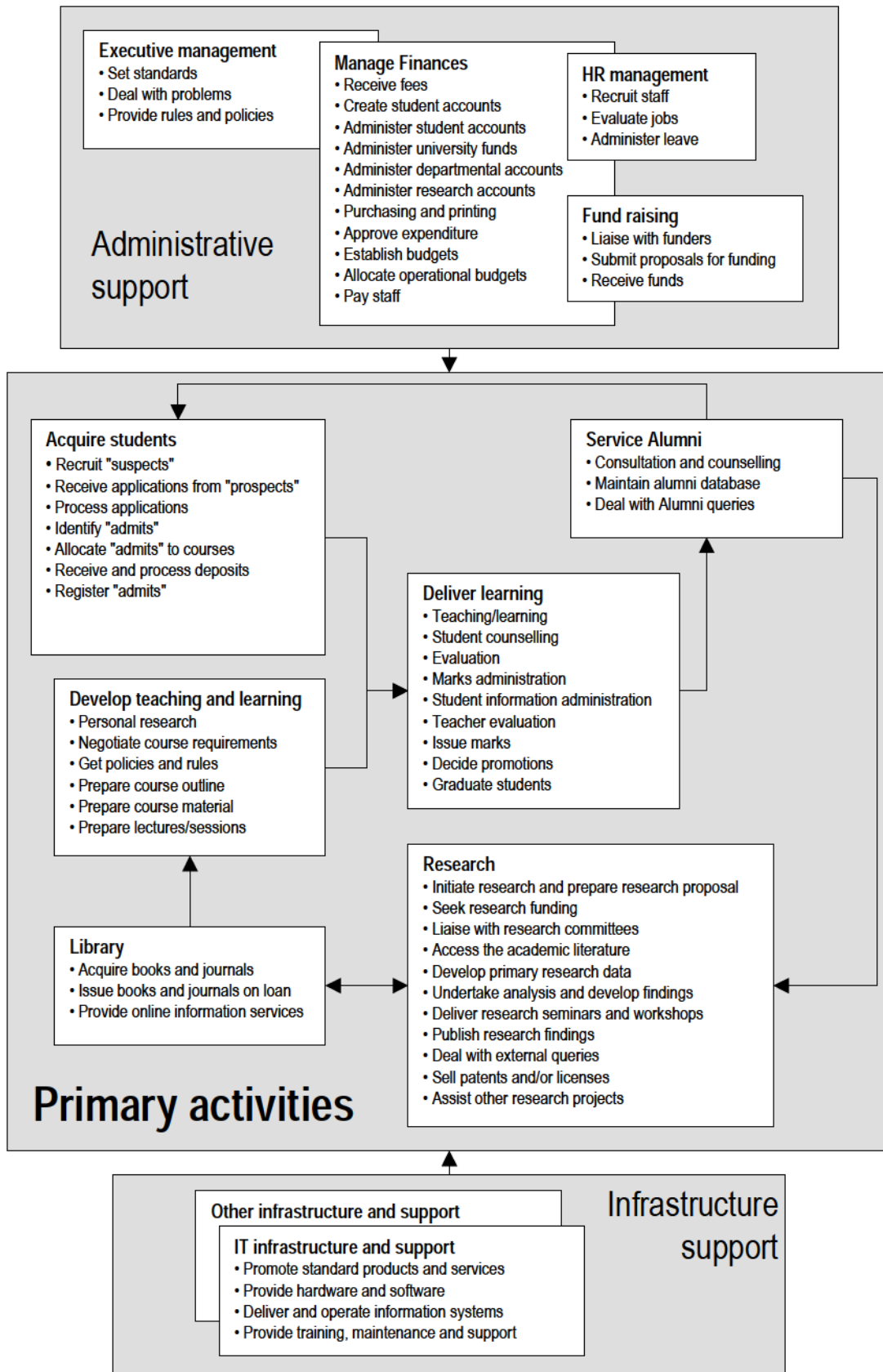
Financial planning and income diversification

It is very clear from our investigation that the financial systems of the university are inadequate and need urgent attention. Income diversification is a different challenge and requires that we understand sources of funding and put more effective and flexible systems into place in order to secure it, whether it is from short course and consultancy activity, or from more intensive efforts to work with donors.

Communications and marketing

The new web site is barely a year old and yet it has served us well. We must support it properly and give it the attention that it needs if it is to continue to serve us well. It was gratifying to hear that it had done well in a competition between different web sites at South African tertiary institutions.

Another strategic issue in many organisations is the management of contact information. This is about names and addresses at the basic level but a *much* more sophisticated management of information about partners, associates and alumni at another. In big business this is now spoken of as “customer relationship management”. We do not need an automated call centre at UWC (this is one visualization of what customer relationship management is), but we *do* need reliable information about alumni, partners and associates. This could be a key strategic move that was not identified in the initial part of this study.



A model of key UWC activities and processes

5 Mapping systems to processes

The model on the previous page is an overview of all the activity at UWC that was identified during the study (see the appendices for the original detail), organised into the following groupings of activity:

Primary activities

- Acquire students
- Develop teaching and learning
- Deliver learning
- Service alumni
- Library
- Research

Administrative support

- Executive management
- Manage finances
- HR management
- Fund raising

Infrastructure support

- IT Infrastructure and support
- (Other infrastructure exists but is not detailed)

It would be possible to go into a great deal more detail but at this stage it would not be helpful. What we can do with this simple (and tentative) model of UWC activities is map the applications identified in the previous section, in order that we can begin to see the contribution that each might make. This is done in the table that follows.

No attempt has been made at this stage to prioritise or rank the different applications. When the strategic plan has developed to the stage that organisational activities and processes have been prioritised for improvement, adaptation or change, then this table will direct us to the information systems applications that will facilitate the implementation of the strategy.

However, it is interesting that this analysis reveals, perhaps for the first time, the extent to which new information systems investments could improve the primary activities of the institution: delivering education to students, undertaking research, and managing the repository of knowledge in the library.

At any point in the table, a tick thus: ✓ indicates the probability that the application (to the left) will contribute to the activity (above).

A question mark thus: ? indicates the possibility that the application might contribute to the activity.

Information System (Application)	Primary activities						Administrative support				Infra- struct- ure
	Acquire students	Develop teaching and learning	Deliver learning	Service alumni	Library	Research	Executive management	Manage finances	HR management	Fund raising	IT Infrastructure and support
<i>Innovative applications</i>											
Video conferencing for teaching			✓								
Virtual campus	✓	✓	✓	✓	✓	✓					
Web based student recruitment	✓										
UWC Intranet			✓		✓	✓	✓	✓	✓	✓	
Law faculty database (Jutastat)			?			?					

Innovative applications are critical only so that an organisation understands its future opportunities. They are difficult to justify because the benefits are not known. In effect, the benefit is often simply to understand something that was previously not understood. The required investment might be limited and more concerned with the investment of an individual's time than money.

	Acquire students	Develop teaching and learning	Deliver learning	Service alumni	Library	Research	Executive management	Manage finances	HR management	Fund raising	IT Infrastructure and support
Strategic applications											
Web based student placement	✓		✓	✓							
Web based student registration	✓										
Online student information	✓		✓	✓			✓	✓			
Multimedia course development		✓	✓								
Web teaching & learning		✓	✓								
Web supported assignment and assessment system			✓								
Improved Internet access	✓	✓	✓	✓	✓	✓				✓	✓
Faculty managed systems	✓	✓	✓	✓		✓					
Teaching systems		✓	✓								
Quality management system	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Knowledge repositories		✓			✓	✓					
Contact management system	✓			✓		✓	✓			✓	

Strategic applications are critical both today (for competitive advantage) and in the future (for longer term success). They are usually justified by an argument that they distinguish one organisation from others in its field – in effect they mark an organisation as a leader (or not) in its chosen sector.

	Acquire students	Develop teaching and learning	Deliver learning	Service alumni	Library	Research	Executive management	Manage finances	HR management	Fund raising	IT Infrastructure and support
Operational applications											
Student network management			✓			✓	✓				
Student print services			✓			✓					
Internet management		✓	✓		✓	✓	✓				✓
Resource bookings		✓	✓				✓				
PC Laboratory booking system			✓								
UWC Web site	✓		✓	✓	✓	✓	✓		✓	✓	
MIS systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Marks administration			✓	✓							
Exams administration			✓	✓							
Financial management							✓	✓		✓	
Aleph library system		✓			✓	✓					
Library services		✓			✓	✓					
Electronic Mail services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Network management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Operational applications are valuable and critical. They are usually justified by an arguments that without them it will be impossible to achieve effective working – in effect they qualify an organisation to operate in its chosen sector.

	Acquire students	Develop teaching and learning	Deliver learning	Service alumni	Library	Research	Executive management	Manage finances	HR management	Fund raising	IT Infrastructure and support
Support applications											
ITS problem mgt system											✓
Virtual notice boards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Virtual brochures	✓					✓				✓	
IT Services help desk system											✓
Telephone mgt system							✓	✓			✓
General ledger and budgets								✓			
Stores and purchasing			✓			✓					✓
Inventory system								✓			
Personnel management									✓		
Payroll and leave administration									✓		
Transport services								✓			
Virus protection											✓
Personal Internet usage		✓				✓				✓	
Personal productivity software	✓	✓	✓	✓		✓		✓	✓	✓	✓

Support applications are valuable but not critical. They are usually justified through arguments for efficiency and generic solutions are appropriate.

6 What do we actually need to do?

Acting upon the results of this study and delivering a full portfolio of information systems will not be easy. It will not be possible to redress the whole shortfall in a few months, nor even within a few years. It is necessary to prioritise and to recognise the limitations of our current capabilities to successfully implement systems and drive through any business change. Further, this was a limited study constrained by time and resources.

The journey from strategy formulation through strategy implementation and the realisation of benefits is a complex one. It is not a question of simply tasking a team of technical experts with the job. It is not even a question of throwing money at the problem: there has to be a willingness and a capability *in the organisation at large* to understand the need for change and to embrace it willingly and positively. Without this, all efforts will come to nought.

In order to manage the achievement of strategic change, based upon the development and introduction of new information systems, conventional wisdom tells us that there are at least six levels of necessary activity that must be carefully co-ordinated. From the top down

- ***Business strategy must be formulated and promulgated.*** We have been working on this now for many months. Typically this is the shortest step to take and (some would say) the most straightforward. We must accelerate the process of implementation if the strategy is to succeed. The world will not wait for us.
- ***The strategy must be implemented.*** Whereas the formulation of business strategies is generally seen to be a short, fulfilling exercise, the implementation of a strategy can be a nightmare because managers and others who acceded willingly to the *discussion* of change then *resist* it within their own domain of control.
- ***Business processes must be managed.*** Strategy implementation usually requires change to business processes, and UWC will be no exception. All role players must recognise the primacy of the overall business process that we are striving to service: the organisation and its departments, divisions and units must be allowed to recede into the background. Without an understanding of the proper business process, any attempt to change will only lead to further fragmentation and inefficiency.
- ***Information systems must be implemented.*** Implementation projects must be planned and managed in order to bring operational changes into being, at the level of new software and hardware, training for staff, and new business procedures.
- ***Information systems and technology must be acquired.*** Any system requires a combination of components and services that will come from different outside suppliers. These suppliers must be dealt with by effective contract management. Perhaps the IT department is often not the best department to negotiate and agree contracts. We must decide how we are to deal with them, and how we will ensure supplier performance.
- ***Infrastructure must be managed.*** In order for all the above to work, and in addition to traditional infrastructure, there is a need for well-engineered and well-maintained information technology infrastructure.

Weakness at any level threatens the success of the whole. The scope at each level of activity is not necessarily the same: infrastructure is pervasive but a single information systems application may be tightly focused on one department. Different mindsets are to be found at the different levels of working, and people at different levels even use different vocabularies to negotiate and to report on problems.

Some of this work must be done by the university, some by faculties, some by departments, and some by IT Services alone. Some decisions will have to be taken by the formal structures of the university and some by operational or service managers. This all adds up to a significant management challenge.

7 Conclusions and recommendations

As a result of this analysis we have to conclude that, despite a limited number of evident ideas for future information systems within UWC, there are probably more opportunities than we might be able to deal with, and that we must *limit* the scope of what we attempt to do until we have built up our competency to manage this kind of challenge.

The UWC Strategic Plan has not yet prioritised the areas of action and only when this is done will we be able to prioritise the investment in information systems. We must identify the areas of our activity that we consider to be critical, and then we must apply ourselves to the acquisition, development, and implementation of new information systems that will facilitate improvement, adaptation and change.

It is therefore difficult at this time to come to simple, clear recommendations for improvement, adaptation and change through new information systems. Nevertheless this study has provided frameworks that will support a more effective discussion about what we must do, when strategic decisions have been taken. Further, it is possible to conclude with some recommendations that will be preparatory to the implementation of any strategy:

- The analysis of organisational activities should be reviewed, developed and negotiated until we have a stable and agreed model of what we are all doing.
- The solicitation of ideas for new information systems should be widened in order to gain the fullest appreciation of the potential benefits.
- The balance of benefits from investment in academic as opposed to administrative systems needs to be investigated and negotiated further.
- The actual contribution of the ITS package to the needs and opportunities identified here needs to be critically assessed. If it is not a useful contribution then we should seek another approach to the improvement of our administrative and academic work.
- The ability of the organisation to achieve improvement, adaptation and change needs to be understood and managed.
- The means whereby we will fulfil the management challenge as detailed above (see Section 6) must be discussed and agreed. Without an agreed definition and allocation of management responsibilities, the whole institutional strategy (not just our information systems strategy) will be put at risk.

Appendices

These appendices record some of the detail from the original reports, from which this summary report has been derived.

- A* *A model for teaching and learning*
- B* *A model for research*
- C* *A model for infrastructure and support*
- D* *A model for administration*
- E* *Sources and contributors*
- F* *The ITS package: modules and linkages*

A A model for teaching and learning

- Acquire students
 - Recruit “suspects”
 - Receive applications from “prospects”
 - Process applications
 - Check admission requirements to identify “admits”
 - Allocate “admits” to courses
 - Receive and process deposits
 - Register “admits” (department, faculty and university?)
 - (Note the Senate Discretionary students admitted this year)
- Develop teaching and learning resources (varies from teacher to teacher)
 - Personal research
 - Negotiate course requirements
 - Get policies and rules
 - Prepare course outline
 - Prepare course material
 - Prepare individual lectures/sessions
- Deliver learning
 - Teaching/learning
 - Student counselling
 - Evaluation
 - Marks administration
 - Student information administration
 - Teacher evaluation
- Conclude learning
 - Issue marks
 - Decide promotions
 - Graduate students
- Service Alumni
 - Consultation and counselling
 - Maintain alumni database
 - Deal with Alumni queries

B A model for research

- Initiate research and prepare research proposal
- Seek research funding
- Liaise with faculty and university research committees
- Access the academic literature
- Develop primary research data
- Undertake analysis and develop findings
- Deliver research seminars and workshops
- Publish research findings
- Deal with external queries
- Sell patents and/or licenses
- Assist other research projects

C A model for infrastructure and support

- Receiving and checking hardware
- Storage of hardware at ITS
- Installation of software and hardware
- Promotion of standard products and services
- Training, maintenance and support

D A model for administration

- Executive management
 - Set standards
 - Deal with problems
 - Provide rules and policies
- Manage Finances
 - Receive fees
 - Create student accounts
 - Administer student accounts
 - Administer university funds
 - Administer departmental accounts
 - Administer research accounts
 - Approve expenditure
 - Establish budgets
 - Approve and allocate operational budgets
 - Pay staff
- Purchasing
 - Negotiate supplier contracts
 - Acquire stock
 - Issue stock
- Manage information technology related services
 - Provide technical assistance
 - Provide information systems (applications)
 - Provide information (marks, class lists etc)
 - Provide infrastructure (labs, network, computers)
 - Provide IT training
- Library
 - Acquire books and journals
 - Issue books and journals on loan
 - Provide online information services
- Research support
 - Provide research information – sources of funds
- Printing
 - Provide printing services
- Human resource management
 - Recruit staff
 - Evaluate jobs
 - Administer leave
- Fund raising
 - Liaise with funders

- Prepare and submit proposals for funding
- Receive funds

E Sources and contributors

(Alphabetic order)

- Cecil Abrahams
- Fatima Abrahams
- Andy Bytheway
- Renfrew Christie
- Naresh Darjee
- Madge du Preez
- D Du Toit
- O N Geldebloem
- D Hamman
- Ricardo Harry
- Derek Keats
- Thando Mjebeza
- Vincent Morta
- Cedrick Muleya
- Busi Ngidi
- Karolina O'Donaghue
- D P Orderson
- T Pretorius
- Debbie Smit
- Peter Vale
- Gerrit Wiechers

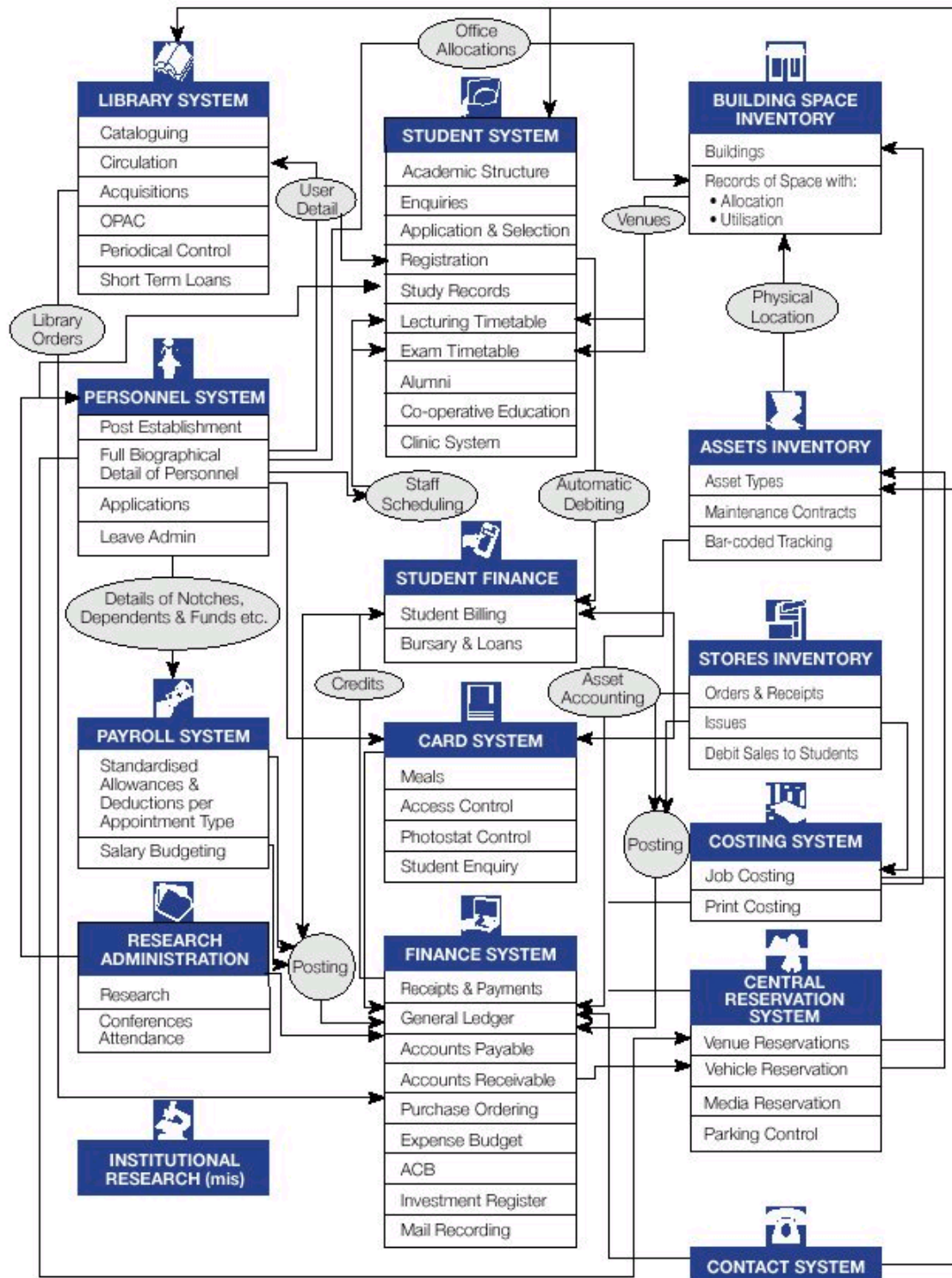
And many others including

- UWC students
- UWC Staff responding to the invitation to make comments
- ITS (Business Alliance Partner of Oracle SA)

Web sites:

- <http://cseweb.uwc.ac.za/tltu> (5 November 2000)
- <http://cseweb.uwc.ac.za/tltu/mmdag.html> (10 November 2000)
- <http://kewl.uwc.ac.za> (5 November 2000)
- <http://www.fm.co.za> (5 November 2000)
- <http://www.ncbi.nlm.nih.gov/class/mlacourse>
- <http://www.sanbi.ac.za> (17 November 2000)
- <http://www.uwc.ac.za> (30 September 2000)
- <http://www.uwc.ac.za/ems/is/is321> (17 September 2000)
- <http://www.fm.co.za/00/1020/focus/cfocus.htm> (17 November 2000)
- <http://www.its.co.za> (27 November 2000)

F The ITS Package: Modules and linkages



Linkages between ITS Systems