



University of Chester



**This work has been submitted to ChesterRep – the University of Chester’s
online research repository**

<http://chesterrep.openrepository.com>

Author(s): Dennis Holman

Title: Web-based information systems: An assessment of impact

Date: May 2003

Originally published as: University College Chester MBA dissertation

Example citation: Lavelle, L. (2003). *Web-based information systems: An assessment of impact*. (Unpublished master’s thesis). University College Chester, United Kingdom.

Version of item: Submitted version

Available at: <http://hdl.handle.net/10034/91247>

**WEB-BASED INFORMATION SYSTEMS:
AN ASSESSMENT OF IMPACT AT
CHESTER COLLEGE**

DENNIS HOLMAN

A dissertation submitted in partial fulfilment of the requirements of
Chester College for the degree of Master of Business Administration

CHESTER BUSINESS SCHOOL

MAY 2003

Abstract

Chester College developed its first formal Information Strategy in 1999, within which was the major commitment to develop an integrated web-based information system to replace the majority of unintegrated and/or paper-based systems used across the institution. The system, 'IBIS' (Internet-Based Information System), was seen as a major driver for instigating change and had a broad range of objectives beyond the purely functional ones, including the changing of work practices and a realignment of attitudes and culture.

In 2001 College committees received a summary of functional changes resulting from IBIS. However, a number of authors suggest that to gain a real understanding of the impact which an information system has achieved within its organisation it is necessary to take into account a whole range of issues, attitudes, and perceptions at both individual and workgroup level. To date no such appraisal has been undertaken within Chester College, though the available literature suggests that the College is anything but unique in this as few firms successfully undertake the exercise in practice.

This present research study was therefore undertaken in order to assess the impact that IBIS had achieved during its first four years of development and implementation.

A questionnaire, the design of which was informed by a literature survey and exploratory interviews with three staff, was issued to 55 current academic staff members who had been employed full-time by the institution prior to the introduction of IBIS. The 50 responses were analysed in tabular form for perceived impacts upon individuals, workgroups and the institution as a whole.

The conclusion reached was that, overall, IBIS has achieved a positive impact within the College and the potential benefits identified within the 1999 strategy were being achieved. However, a number of issues were identified from the analysis which were leading to the potential impact being lessened for certain individuals and workgroups, resulting in some loss of organisational efficiency and effectiveness. Recommendations are proposed to address these issues.

Acknowledgements

I would like to particularly record my thanks to:

- Mr. Steve Page of Chester College's Department of Business and Management, who, with his enthusiasm and encouragement, guided me to the completion of this dissertation.
- colleagues at Chester College who have participated in interviews and completed questionnaires in order that I might collect the primary data for this study, and to others who have offered ideas and observations.
- Prof. Tim Wheeler and Prof. David Cotterrell who have given me the opportunity to work on Chester College's Information Strategy from its inception, which was the starting point for this dissertation some four years ago.

Declaration

This work is original and has not been submitted previously for any academic purpose.
All secondary sources are acknowledged.

Signed:

Dennis Holman

Date:

Contents

	Page
<i>Abstract</i>	1
<i>Acknowledgements</i>	2
<i>Declaration</i>	2
<i>Table of Contents</i>	3
<i>List of Tables</i>	6
<i>List of Figures</i>	7

Chapters

1. Introduction

1.1 Background to the Research	8
1.2 Research Question and Objectives	11
1.3 Justification for the Research	12
1.4 Methodology	14
1.5 Outline of the Chapters	15
1.6 Definitions	16
1.7 Summary	17

2. Literature Review

2.1 Introduction	18
2.2 Parent Disciplines / Fields	18
2.3 Main Theme, Analytical Models and Applicability to Research Question	18
2.3.1 Towards the Ideal	18
2.3.2 Evaluation and Assessment	20
2.3.3 Assessing Use	22
2.3.4 Understanding Impact	23
2.3.5 Dimensions of Potential Impact	24
2.3.6 Attitudes to Change	27
2.3.7 Information Overload	29
2.3.8 Specific e-mail Issues	30
2.3.9 IS Culture Gap	33

2.3.10 Other Relevant Issues	33
2.4 Summary	34
3. Methodology	
3.1 Introduction	35
3.2 Methodological Considerations	35
3.2.1 Justification for the Selected Paradigm and Methodology	35
3.2.2 Rejected Methods	37
3.3 Research Procedures	38
3.4 Ethical Considerations	39
3.5 Summary	40
4. Findings	
4.1 Introduction	41
4.2 Research Design	41
4.3 Application of Methodology	43
4.4 Findings for Each Research Question	46
4.4.1 Questionnaire Section 1 – About You	46
4.4.2 Questionnaire Section 2 – Your Use of IBIS	49
4.4.3 Questionnaire Section 3 – How has IBIS changed You?	51
4.4.4 Questionnaire Section 4 – How has IBIS changed your Workgroup?	55
4.4.5 Questionnaire Section 5 – How has IBIS changed the Organisation?	59
4.4.6 Questionnaire Section 6 – Broader Perceptions	61
4.4.7 Questionnaire Section 7 – Assessing IBIS	63
4.4.8 Questionnaire Section 8 – The major impacts of IBIS	64
4.5 Summary	66
5. Conclusions and Implications	
5.1 Introduction	67
5.2 Critical Evaluation of Adopted Methodology	67
5.3 Conclusions about Each Research Question	68

5.4	Conclusions about the Research Problem	71
5.5	Limitations of the Study	71
5.6	Opportunities for Further Research	72
6.	Recommendations	
6.1	Recommendations and Implementation Plan	74
	Bibliography	77
	Appendices	
A:	Progress in Implementing Chester College's Information Strategy (a committee paper)	79
B:	Areas Considered for Interviews and Questionnaires	81
C:	Guide Questions for Initial Interviews	83
D:	Invitation to Participate and 'Chasing' e-mails	84
E:	Questionnaire: An appraisal of the impact of IBIS on Chester College 1999-2003	86

List of Tables

Table	Page
4.1 Analysis of Overall Response Rate	45
4.2 Analysis of Issue / Return by Academic Department	45
4.3 Analysis of Response Rate between Heads of Department and Lecturers	46
4.4 Analysis of respondents' level of involvement and responsibility	47
4.5 Analysis of involvement with European Computer Driving Licence (ECDL) programme	47
4.6 Analysis of involvement with European Computer Driving Licence (ECDL) programme according to respondents' level of involvement and responsibility	48
4.7 Respondents' self-assessed level of computer literacy	48
4.8 Analysis of involvement with ECDL against respondent's claimed computer literacy score	49
4.9 Attendance of respondents at training events	49
4.10 Respondents' use of IBIS (Questionnaire section 2)	50
4.11 How many hours do you spend working at your computer each week?	52
4.12 How does the number of hours you spend at your computer now compare to that of 4 years ago?	52
4.13 Has the introduction of IBIS enabled you to spend more of your working time at home?	53
4.14 How has IBIS changed you personally? (Questionnaire section 3)	54
4.15 How has IBIS changed your workgroup? (Questionnaire section 4)	56
4.16 How has IBIS changed the organisation? (Questionnaire section 5)	59
4.17 Broader perceptions of the impact of IBIS (Questionnaire section 6)	61
4.18 Has the introduction of IBIS created a sub-culture of people who do not have access to the system?	62
4.19 Respondents' assessment of IBIS (Questionnaire section 7)	63

List of Figures

Figure		Page
1.1	The Dialectical Nature of Information Systems	13
1.2	Information Systems Impact	14
2.1	Factors Influencing the Success or Failure of Information Systems	24
2.2	Dimensions of Impact	25
2.3	A Spectrum of Attitudes to Cultural Change	29
4.1	A Value Chain Analysis of Chester College's Implementation of web-based Information Systems	44

Chapter 1

Introduction

1.1 Background to the Research

“It has become something of a truism that the success of an organisation is dependent on its information systems.”

Beynon-Davies 2002

It is thus no surprise that Information Strategies have emerged over the last ten to fifteen years as an essential management tool to link the delivery of a company's (or institution's) mission to the overall information resource.

The National Committee of Inquiry into Higher Education (Dearing 1997) produced many recommendations including:

“Recommendation 41

We recommend that all higher education institutions in the UK should have in place overarching communications and information strategies by 1999/2000”

At the time of the Dearing Report very few Universities or Colleges had such a strategy in place. Subsequently, substantial guidance was received concerning the production of such a strategy from the Joint Information Systems Committee (JISC), which published a number of guidelines and case studies during late 1997 and early 1998. Chester College produced a draft of its first Information Strategy in summer 1998, which, through wide consultation within College, underwent a series of iterative amendments. A final approved version was accepted by Academic Board and the Governing Body in July 1999.

The Information Strategy was intended to form an integral part of a hierarchy of strategies within the College, and has particularly strong links to the Learning and Teaching Strategy and the Information Technology Strategy, as well as a number of management-focussed strategies. However, since ‘information’ is key to all aspects of work and decision-making it should be noted that this strategy links to *all* others, to a greater or lesser extent.

The Information Strategy produced for Chester College sought to provide a focus for information issues within College and evolved from an identification and consideration

of the information needs stemming from the College Corporate Plan. It endeavoured to help the College achieve its Mission by providing a link between the overall Corporate Plan and the operational requirements of the College. As such, it was viewed as a tool for management, a means by which changes could be brought about, and as a force for the re-evaluation of attitudes, approaches and culture.

“An effective Information Strategy will ensure that investment in Information, Information Technology, Systems and Services is efficient and effective; and that information produced within the Institution is exploited to the benefit of the Institution.”

(JISC Executive Briefing March 1998)

The overall aim of the College’s Information Strategy was to allow the College's staff and students to make an orderly migration to a world in which an increasingly high proportion of the information by which we live is in digital form, and it sought to improve the efficient and cost effective management of information in pursuit of the College’s Corporate Strategic Plan.

The overall objectives were, firstly, to help all staff to make better decisions more efficiently, to improve their effectiveness and to minimise administration; and, secondly, to develop policies and practices which protected the information assets of the College and to allow the Governing Body, the senior management and all members of the College to manage and develop those assets responsibly and effectively.

Key to the Information Strategy, then, was the building of an ‘information culture’ throughout the College, in which the management of information for both teaching and administration would be embraced as a core activity. This has represented a major cultural shift for staff and students 1999-2003.

The implementation of the vision within the strategy has been rapid during 1999-2003, and has had far-reaching effects for both staff and students, and on the methods by which the College communicates with people external to the institution. The strategy continues to evolve through the work of the Information Strategy Committee.

Although broad in the issues it addressed in setting the College on a new developmental pathway, the original 1999 Information Strategy (“Meeting Information Needs: Developing an Information Strategy for Chester College 1999-2004”) had, as its

prime focus, the development and implementation of an over-arching web-based information system, “IBIS” (the Internet-Based Information System).

Just prior to 1999 the College had begun to introduce a fairly rudimentary and ad-hoc intranet system, largely for the common distribution of commercial software and learning packages, provision of e-mail facilities and WWW (World-Wide Web) access; investment in both financial and human terms was, however, limited. College-focussed information was generally paper-based with closed circulation and limited audience availability. The new strategy proposed the development of an ‘open information culture’, where a conscious decision would be required by generators and holders of information if they wished to restrict the publishing of that information (as distinct to deciding to make it available), and that such publishing should be to a common web-based format on IBIS.

In order to drive this forward the Senior Management of the institution provided a significant increase in the resourcing levels for the recently created Communications and Information Technology Services department. They also provided the funding for a significant increase in the number of computers college-wide so that all academic staff could have their own networked machine and so that all students would have easy open-access availability.

All authors of management theory textbooks emphasise the need, when undertaking major developmental projects, to evaluate the results of that development in order to ensure that the aims are being met effectively and that resources are being used efficiently. However evaluation of the Chester College IBIS project has been limited to:

- oral feedback through departmental and School representatives to an IBIS Users’ Group and hence to the Information Strategy Committee,
 - various discussion papers produced by subgroups within the institution (e.g. Bennett et al. 2002), and
 - a functional appraisal of how IBIS has been used at a systems level within both academic and support departments, by the Information Strategy Committee in 2001.
- This limited evaluation is despite an investment of several million pounds overall into the project.

However, a number of authors and researchers suggest that not only is investment in computer-based information systems questionable in cost-benefit terms, but that seeking to evaluate returns in investment is far from easy. Remenyi et al. (1998) state:

“Despite (an) increased role of Information Technology in organisations and increased expenditure there is considerable doubt as to whether IT investments are proving to be justifiable. Establishing or measuring the business value of computer-based systems have perplexed managers and researchers for several years. A number of studies present contradictory evidence as to whether the expected benefits of computers have materialised.”

Other authors are far more forthright:

“The intranet, as the corporate information infrastructure is called, is supposed to dramatically enhance employee productivity. That’s the party line, but it’s not the reality. The reality is that most intranets are a mess. Employees waste inordinate amounts of time trying to find answers to their problems, and most companies have no active programs in place to improve their intranets or make them into productivity tools. Intranets often suffer from the worst mistakes of website design while having only a fraction of the budget allocated to marketing-oriented websites.”

Jakob Nielson (2001)

1.2 Research Question and Objectives

The research problem, therefore, is to determine whether or not the introduction of IBIS has had a beneficial impact upon the institution and to determine if the significant amount of funding provided to the project has met the desired outcomes. As identified in chapter 3 the most effective way seen by this author of tackling the problem is to seek information from individuals who interact with IBIS. However, this is a task which, to be tackled comprehensively, would require a very major data gathering exercise, outside the scope of this current study, as IBIS has impacted upon every function, department and workgroup within Chester College, and almost every employee to some extent. The problem is therefore addressed only from the perspective of a sub-group of academic staff, selected to criteria based primarily on having been employed prior to the introduction of IBIS.

The research question addressed within this dissertation is:

How has the introduction of an information strategy at Chester College founded on the implementation of web-based information systems impacted on and changed the institution from an academic staff perspective?

There are three objectives for seeking answers to this question:

1. Understanding what the overall impact has been will enable some identification of where original aims and objectives of the introduction of IBIS have not yet been achieved. The research will enable some analysis of the underlying reasons for this, enabling the Information Strategy Committee to recommend either corrective action or to amend the strategy in future revisions.
2. The identification of negative impacts will enable problems and difficulties which have arisen through the introduction of web-based information systems, but which may not have yet been identified, to be addressed and possible solutions suggested.
3. The identification of positive impact areas will enable the particular successes of the introduction of web-based information systems at Chester College to be clarified and recommendations made for the further enhancement of systems in the future.

1.3 Justification for the Research

Chester College, in common with all institutions in the UK Higher Education sector, is facing ever-increasing demands to provide wider services but is also required to accomplish this with an ever-dwindling unit of resource from its funding bodies. Consequently it is vital that all activities and systems should operate as effectively and as efficiently as possible in order to achieve the maximum number of best possible outcomes and outputs with as little input of resource as possible. At the core of all activities and systems is information. The College has chosen to focus all of its information systems into IBIS and it is therefore essential that this should be managed and developed to best possible effect.

Beynon-Davies suggests that information systems inherently have a dialectical nature:

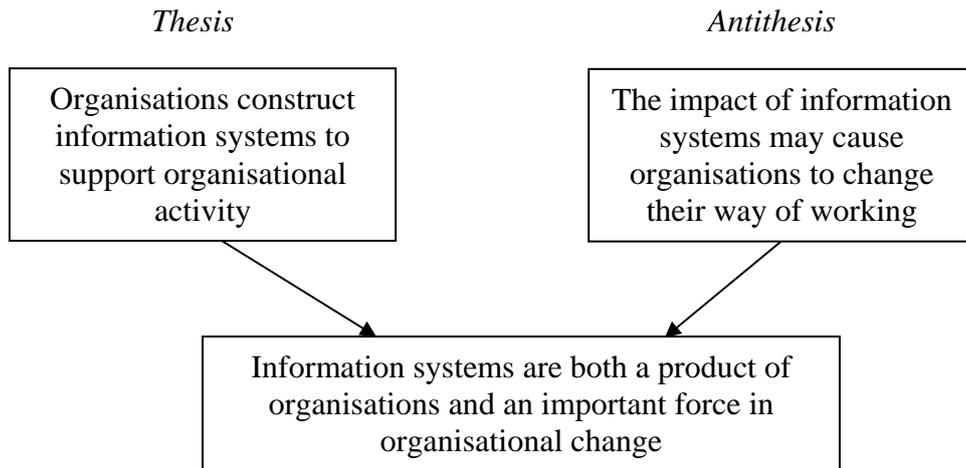


Fig 1.1: The Dialectical Nature of Information Systems
(adapted from Beynon-Davies 2002)

On one hand (which he refers to as the *thesis*) he suggests that organisations introduce new information systems to emulate existing ways of working. On the other hand (the *antithesis*) he views new information systems as a revolutionary force to force a change to new ways of working. The *synthesis* suggests that in reality information systems both impact upon the organisation and are impacted upon by the organisation, and thus are both a product of the need for change and an important force in driving change.

At Chester College the introduction of IBIS was seen from the outset as having both aspects. The Information Strategy Committee made an attempt to evaluate the ‘thesis’ nature in 2001 by identifying and listing the functional areas which had made significant use of IBIS to support their activities: as one example, by the electronic posting of staff handbooks by Human Resource Management Services. Such effects are planned and monitored from the outset. The ‘antithesis’ aspect has not to date been appraised, yet could be seen as more important in that it fundamentally affects *people*, the most expensive resource within Chester College, and that the changes to the way of working may be uncontrolled, unmonitored and detrimental to efficient working practices.

Beynon-Davies further expands on this theme by discussing how the impact of an information system can only properly be assessed after it has been implemented and used. Assessment of the impact can then feed back into changes to both the organisation and the information system itself.

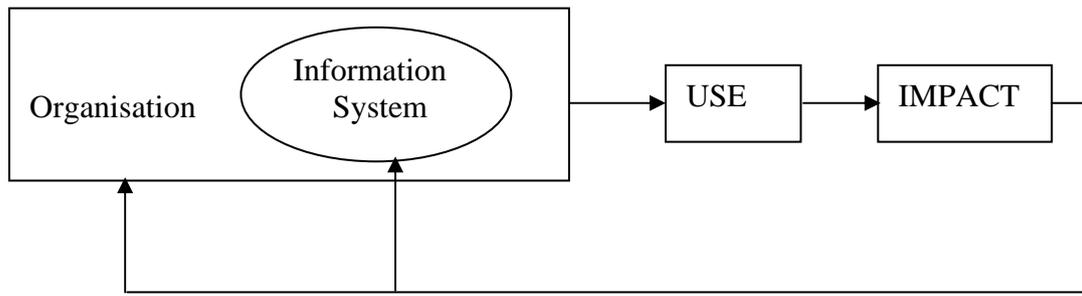


Fig 1.2: Information Systems Impact (Beynon-Davies 2002)

Combining these two understandings suggests that the ‘thesis’ of figure 1.1 could be seen as the arrow leading into the ‘Use’ box of figure 1.2, whilst the ‘antithesis’ could be seen as the arrow between ‘Use’ and ‘Impact’. In order to achieve feedback into the organisation and improve the information system Beynon-Davies’ model suggests that it is necessary to assess and evaluate the impact following use.

The period 1999-2003 saw Chester College implement the technological infrastructure which would allow IBIS to run across its various campus sites, and to implement a number of systems within IBIS to support organisational activity. It is suggested that the use of IBIS is now sufficiently part of the culture of the institution that a detailed assessment of impact would be appropriate and timely in order to provide reliable evidence to inform the future development of both the College and the IBIS itself.

Consequently, as a result of addressing the research question, it is anticipated that the results will suggest changes in the immediate functions and implementation of IBIS, and identify strengths and weaknesses in the existing Information Strategy, which can be addressed in the next revision scheduled for August 2003.

1.4 Methodology

Remenyi et al. (1998) suggest that:

“Despite (an) obvious need for evaluation there is little agreement, among IS professionals and academics, as to specifically how the contribution of an information system to an organisation can be evaluated. at present there seems to be little consensus among researchers and practitioners as to which instrument or methodology is appropriate for IS evaluation.”

A number of alternative methodologies were considered for evaluating the impact of IBIS. The broad methodology finally adopted for this dissertation is based on a

deductive approach, where primary data is collected through a questionnaire informed by interviews, and analysed against existing models and theories.

The need to undertake a literature review as the first stage in any research, no matter what the methodology, is well documented (e.g. Saunders et al. 2000, Blaxter et al. 2001) in order to secure a good understanding of the subject matter within the area of study. However, for the deductive approach it is important that this be comprehensive prior to formulation of the data collection method in order to best identify existing theories and models against which the research data to be sought can be tested. Carroll and Swatman (2000) argue that, within the field of information systems, the literature survey should not be restricted tightly to the discipline of IS as issues often benefit from a multidisciplinary approach.

Following analysis of models and a number of specific areas a primary data collection method is developed, following which analysis against the models is used to address the specific research question identified in 1.2. Finally a set of conclusions and recommendations consistent with the research objectives lead to the formulation of an implementation plan for deriving benefit for Chester College from this study.

1.5 Outline of the Chapters

Chapter 1 sets the context in which the research is to be carried out, and identifies the need for such research. The broad methodology to be adopted is discussed.

Chapter 2 undertakes a detailed literature review and summarises the main conclusions and issues appertaining to the specific research question posed.

Chapter 3 specifically addresses the methods and procedures to be used in the collection of the primary data.

Chapter 4 summarises the findings of the analysis of this data.

Chapter 5 relates the findings specifically to the research question and draws conclusions relevant to each objective. This chapter also addresses the limitations and shortcomings of the research and suggests what further research could extend the value of this project, both for academic benefit and specifically for the benefit of Chester College.

Chapter 6 summarises how Chester College could benefit directly from this research project by proposing an implementation plan of recommendations.

1.6 Definitions

Extranet: An intranet to which access is made available to certain authorised users outside the recognised company boundaries, using an external communication infrastructure (such as telephone or Internet); typically, enhanced security protection measures will be in place to prevent unauthorised access to information or systems within the company.

Human Activity System: A logical collection of activities performed by some group of people with a distinct goal or goals which it fulfils. (Beynon-Davies 2002)

Impact: Striking (*on, against*); (strong) effect, influence. (*Concise Oxford Dictionary*). Within this dissertation taken to mean a significant change experienced over a period of time.

Information System: The means by which people and organisations, utilising technology, gather, process, store, use and disseminate information. (*UKAIS – The UK Academy of Information Systems*)

Informatics: The study of information, information systems and information technology applied to various phenomena. (Beynon-Davies 2002)

Information Technology: Any technology used to support information gathering, processing, distribution, and use. (Beynon-Davies 2002)

Intranet: A self-contained, internal network that links multiple users by means of Internet technology (Rockwell 1998)

IBIS: Chester College’s self-developed “Internet-Based Information System”. The focus of all College information systems development, and supported by a common intranet technology platform across all sites supporting college learning and administrative activities. Sub-sections of the IBIS are available to authorised users using extranet technology through the Internet with a system called ‘IBIS@home’.

1.7 Summary

Chapter 1 has identified that, in 1999, Chester College was required to write an institutional Information Strategy. In order to engender an “open information culture” it chose to base the strategy around the implementation of a web-based information system termed ‘IBIS’. Although a summary of how IBIS had enhanced functional facility was presented to the Information Strategy Committee in 2001, no assessment has yet been made of the *impact* on the institution as a result of introducing IBIS. A model has been presented which suggests that only after an assessment of impact can the feedback loop to informing further institutional or information system change be completed.

This study, in summary, seeks to assess the impact of IBIS on a selected group of academic staff in order to inform future policy and strategy.

Chapter 2

Literature Review

2.1 Introduction

Chapter 1 identified that the evaluation of information systems is often poorly carried out if, indeed, it is carried out at all, and that there is no consensus on the best methodology to carry out such an evaluation in order to assess impact. Chapter 2 extends this theme, and presents a number of models which, if not actually recommending a methodology to use to assess impact, at least suggest the areas in which questions should be asked.

2.2 Parent Disciplines / Fields

The discipline within which this dissertation is founded is that of ‘Informatics’. This is not an easy term to define, but is used here in the context of referring to the academic discipline and area of professional activity covering the “*application of information, information technology and information systems within organisations*” (Beynon-Davies 2002). It includes the planning, design, implementation and evaluation of information systems and the infrastructure upon which they function, recognising the contribution which such systems make to an organisation’s overall operation, as well as understanding how the activity systems impact upon people, whether individually or as groups. It is upon this latter area that the research within this dissertation focuses.

2.3 Main Theme, Analytical Models and Applicability to Research Question

2.3.1 Towards the Ideal

Johnson & Scholes (1997) comment:

“If information is not available in the right format at the right time, the potential gains of other changes may be lost. This is increasingly important as many organisations become more complex and geographically dispersed”

Remenyi et al. (1998) suggest the way forward and some of the implications:

“In the past decade there has been an increased awareness that information systems can radically transform the way in which organisations do business, transforming the established business practices and transforming the work environment for the organisation’s staff.”

Chester College has expanded its operation not only through an eight-fold increase in student numbers over 15 years but also by taking on sites apart from the main campus. Getting timely and relevant information to departmental and functional managers has therefore been a key issue, and the development of web-based information systems delivered across a common intranet structure has been fundamental in seeking to achieve this.

“Intranets can help organisations create a richer, more responsive information environment.”

(Laudon & Laudon 2000)

The broad intention has been to move towards becoming a ‘digital firm’:

“The ‘digital firm’ can be defined (as) ... where nearly all of the organisation’s significant business relationships with customers, suppliers and employees are digitally enabled and mediated.”

(Laudon & Laudon, 2002)

However, the same authors comment:

“Digital firms require new organisational designs and management processes. companies must examine, and perhaps redesign, an entire business process rather than throw new technology at existing business practices.”

They go on to suggest that such redesign should encompass the organisational structure, the organisational culture, support structures and management procedures, and perhaps even require a fundamentally different business strategy.

The introduction of web-based information systems to Chester College may be viewed as a developmental project in that the strategy defined objectives and aims, that it defined a pathway for instituting change within the institution within a given timeframe, and that it committed resources to the endeavour.

Campbell (2002) offers clear advice as to what makes the perfect intranet:

“Firstly successful intranets are built on smart information design, which means deploying usability research throughout the design lifecycle. Secondly, they focus on tasks, not documents, and aim to integrate those tasks into distinct processes. Thirdly, the best intranets

encourage collaboration by employees around content, and finally they measure what impact the intranet is having on the business. Thinking of the intranet as a tool means understanding it as more than a collection of documents.”

2.3.2 Evaluation and Assessment

As with any project, it is reasonable to expect an evaluation of the actual (as against the predicted) outputs and outcomes for the implementation of a new information system, especially since investment in the project may have been substantial. This should be undertaken in order to determine what benefits have been achieved for the organisation, what changes have been achieved as a result of undertaking the project, and to assess whether the project has been a success or failure.

Ward & Peppard (2002) identify that this can take some time:

“Assuredly, the impact of an IS/IT strategy is not instantaneous, and it may, in fact, take some time – often two or more years – between embarking on an IS/IT strategy formulation and planning process, for the first time, and demonstrating any significant impact on business practices and results.”

Broadly, the literature suggests that information system projects are notoriously hard to evaluate, in that they are rarely closed systems and the difficulty in making a clear delineation of boundaries for outputs and costs results in cost benefit analysis being prone to error and misinterpretation. In a service industry this would appear to be even harder to achieve in that for many projects outputs (i.e. tangible quantifiable benefits) are limited whilst outcomes (non-tangible benefits such as usability enhancement or customer satisfaction) are difficult to value in financial terms. Beynon-Davies refers to these as ‘visible’ and ‘invisible’ costs/benefits commenting that, for the latter “.... *most organisations experience difficulty in assigning actual measurable quantities to such costs and benefits.*”

As an example of this at Chester College it could be argued that the introduction of web-based learning materials enables students to better learn and understand a subject, thus achieving higher assignment grades, thus graduating with a higher degree classification, which then attracts more students to the campus. Whilst this may have some validity the number of factors impacting upon the consequence chain would make any quantification difficult if not impossible.

Bocij et al. (1999) confirm and extend this viewpoint:

“While information system costs are relatively easy to identify, the benefits that accrue from IS investment are harder to quantify. This is because benefits are often intangible in nature and, therefore, harder to ascribe a financial value to. Broadly speaking, benefits from IS investment result from the capability of the organisation to do things that it could not do or did not do very well before.”

Owens (1999) sought to identify current themes in Information Systems evaluation through a detailed analysis of the recent literature and surveys. Within his research he identified many proposed frameworks for IS evaluation, but commented that

“the majority of the frameworks focus on the feasibility or justification stage of IS projects, rather than providing frameworks for ascertaining whether expected or anticipated benefits actually materialise”.

He also observed that the majority of these proposed frameworks had not been implemented or tested.

It is even harder to define what is meant by success or failure of an IS project, and few projects actually define this within their initial specifications. Beynon-Davies suggests a simplistic approach of *“... if benefits outweigh costs then the project and system are regarded as successes. If costs outweigh benefits then the system and project are classed as failures”.*

Various authors make detailed suggestions as to the identification of such benefits through categorisation, for example Bocij et al. (1999) suggest that key questions for any information system must include:

- is the information being provided **relevant** to the business decisions being made?
- is **accurate** information available?
- does the **speed** of information delivery meet user needs?
- does the **functionality** of the system support what we need it to do?
- is the **reliability** of the system such that we can depend on it?

The same authors point out that success is often assumed to be the adequate meeting of desired outputs, but, for example, if users are unable (or unwilling) to use the system as intended then this cannot be classed as success. It is similarly not satisfactory to record failure when not all outputs are met. In reality most large projects are neither successes nor failures but contain elements of each.

The identification of success is further complicated because user expectations change throughout the life of a computer-based project. This phenomenon, which has been regularly observed since the introduction of computer systems in the late 1950s / early 1960s, makes it difficult to gauge to what extent a computer system has achieved success in a user's eyes. Comments such as "yes, that's all very nice, but it would be even better if it could do this and that as well", even though the delivered product meets its original defined specification, are well known to anyone concerned with IT/IS development (Clare & Stuteley 1995). Beynon-Davies (2002) defines the term 'expectation failure' as "*the inability of an information system to meet a specific stakeholder group's expectations*", thus suggesting that a gap between a planned situation and a desired situation may be seen as a failure by some.

Beynon-Davies (2002), in discussing the importance of IS evaluation, suggests that assessment needs to be considered under three areas:

- *functionality*, where an assessment needs to be made as to the system's functional completeness and consistency, i.e. does it do what is required for the organisation?
- *usability*, where an assessment of how well users can actually interface to the system is needed.
- *utility*, where an assessment is required as to the extent to which the system has produced benefit for the organisation.

He further suggests that distinguishing between first and second order effects can assist in making an assessment of the results of introducing a new information system:

"First-order effects concern issues of use. Second-order effects concern the impact of the system on individuals, groups and the organisation as a whole."

He emphasises that:

"Both use and impact are critical to the assessment of the success or failure of some information systems."

2.3.3 Assessing Use

A number of authors (Curtis and Cobham 2002, Bocij et al. 1999, Avgerou and Corford 1993, Barnatt 1996, Laudon and Laudon 2002, Robson 1997) suggest that Michael Porter's concept of Value Chain analysis provides a useful model by which to examine where within an institution information systems may have impacted. Bocij et al. (1999) identify that this may be widespread:

“The relevance for information systems is that for each element in the value chain it may be possible to use IS to increase the efficiency of resource usage in that area. In addition, IS may be used between value chain activities to increase organisational efficiency.”

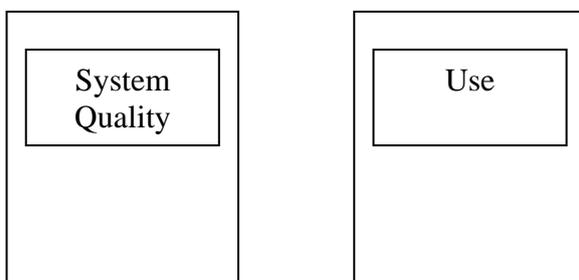
Nielson (1993) sets great importance when assessing the use of an information system on how well it has been ‘usability engineered’, i.e. on how effectively the system interfaces with the user. He identifies five factors that he considers need to be addressed when assessing usability:

- Learnability, i.e. is it easy for a new user to understand how to use the system?
- Rememberability, i.e. once learned, can a user continue to use the system without requiring re-learning?
- Efficiency in use, i.e. users should not be subject to unnecessarily complex or lengthy operations.
- Reliability in use, i.e. the system should enable the user to undertake error-free operations.
- User satisfaction, i.e. the user should feel happy, comfortable and confident in the use of the system.

2.3.4 Understanding Impact

In 1992 DeLone and McLean undertook a detailed review of published material relating to the success or failure of information systems, and as part of this work produced a model which identified their understanding of the factors and variables involved (Figure 2.1 overleaf).

The authors argued that the use made of an information system and the user perceptions relating to their satisfaction of using the system stemmed directly from the functionality of the system. If the ‘quality’ of the developed system was high and the information derived from the system was robust and reliable, then the user would be comfortable in making a full use of the application. Problems in the quality of either the system or the information would result in poor use and little user confidence or satisfaction.



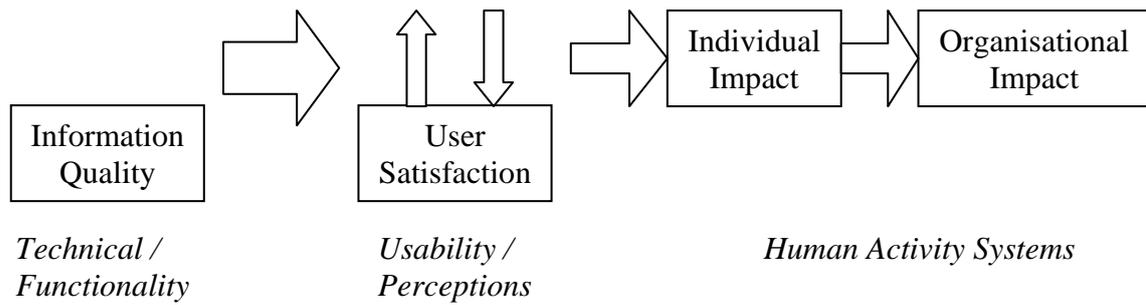


Fig 2.1: Factors Influencing the Success or Failure of Information Systems
 (DeLone and McLean 1992, adapted after Beynon-Davies 2002)

DeLone and McLean introduce the concept of ‘impact’ in this model. As a result of using the system there is an enforced change upon individuals (users, customers, other stakeholders) and, consequently, enforced changes upon the organisation. The authors identify that the impact is not just functional; often there is also significant cultural impact, which may go unrecognised by management.

Clarke (2001) discusses a number of interpretations of the term ‘organisation’ in the context of information systems, amongst them that of the organisation being a social environment composed of individuals and groups of individuals between whom information passes, enabled both by information technology and information systems. He suggests that adopting this view emphasises that the conceptual underpinning of information systems should be seen as human-centred and based on theories of social systems, and not merely on technology.

Boddy and Buchanan (1992) take this theme further:

“Human performance in an IT environment is as much a social and organisational accomplishment as a technical one.”

2.3.5 Dimensions of Potential Impact

Beynon-Davies (2002) discusses the issue of the degree of alignment of an information system with the human activity system into which it is placed. He argues that the impact on the whole informatics model may be analysed in terms of the impact on individuals, on groups and upon the organisation as a whole (Figure 2.2).

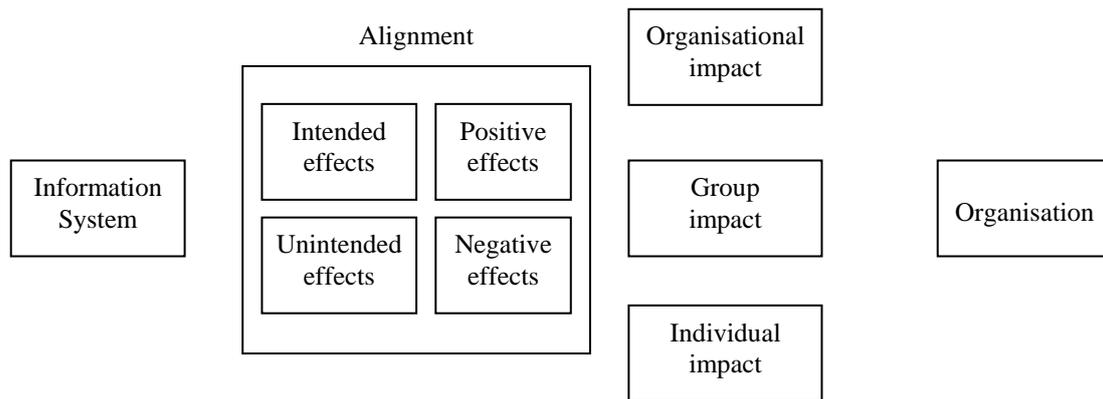


Fig 2.2: Dimensions of Impact (*adapted from Beynon-Davies 2002*)

In discussing the alignment issues Beynon-Davies identifies that the introduction of any new information system into an organisation has the potential for generating both intended effects, which will have been predicted and planned for, and unintended effects. Such effects, he argues, can be identified as either beneficial (positive) or detrimental (negative).

However, what is interesting is that the effects can be viewed as being beneficial or detrimental differently according to viewpoint. In terms of organisational impact it is accepted that investment in information systems is made for reasons of either efficiency or effectiveness. The first of these implies achieving more with fewer resources, which may have a significant negative social impact on individuals and/or workgroups, whilst the second may require changes in working practice leading to power shifts and changed responsibilities.

The potential areas of impact upon groups and individuals are numerous and may be viewed differently, either positively or negatively, by individuals within the same group or by individuals performing the same task with the same information system within the same activity system. Beynon-Davies suggests that areas of potential impact may include:

- job enrichment through reduction of burdensome administrative activities, an increase in worker empowerment through increased information access, and a need to upskill.

- changes in social interaction, collaboration and co-ordination due to shifts in information communication methods.
- work visibility, where co-workers may be able to see an individual’s activities and outputs. This may be particularly relevant for Chester College where IBIS can be seen as presenting a very visible record of some of the activities which certain individuals and groups, both academic and support, perform.
- work monitoring. A computer-based central information system has the potential for capturing significant amounts of monitoring information for use by management in decision making.
- shifts in power and influence within and between workgroups. The adage ‘knowledge is power’ takes on a new interpretation in an open information culture.

Avgerou and Cornford (1993) discuss this latter bullet-point in some depth. They identify that many relationships in human organisations are based on access to and control over information. They suggest that the broadening of access to information:

“may well have the effect of shifting access and control of information to different individuals or groups, and hence in establishing new power relationships.”

Lai and Mahapatra (1998) carried out research into the evaluation of intranets in a distributed environment. The work suggested a classification of impacts, for each of which the authors were able to deduce a relative ‘impact factor’:

Organisational Performance	
– improved data/document communication	4.3
– improved organisational image	4.2
– reduced distribution costs	4.1
– better resource utilisation	4.0
– improved profit margin on product/service	3.5
– increased internal communications	3.1
– improved network security	2.8
Customer Relationship	
– increased market-like customer relationship	4.0
– better customer service	3.9
– reduced use of intermediaries	3.8
– more stable, long lasting customer relationships	2.9
Employee Performance	
– shift of power to lower work levels	4.1
– increase employee’s work productivity	4.0
– improved product/service quality	3.9
– improved employee’s relationship	3.7
– improved decision-making	3.7
– clarification of employee’s roles and responsibilities	3.3

Many of these themes re-emphasise those of other authors and researchers, though it is interesting that the impacts on organisational image and enhanced customer relationships feature so strongly.

Kimble and McLoughlin (1995) investigated the implications of the use of computer-based information systems for managers' work. Fundamental to their case study based approach was the identification of three categories of model:

- a Technology Impact model, the central argument of which is that technology can perform the work of managers more efficiently than a human being, i.e. there is an inherent concept of mechanistic efficiency. This model predicts, *inter alia*, the deskilling of managers as computer-based information systems are introduced.
- a Social Impact model, where technology is used as “*a means of improving a more subjective notion of effectiveness, such as giving people the time, the information and the organisational structures they need to take a more creative approach to their work.*”
- an Integrationist model, where the impact is portrayed not as a linear outcome but as a complex, interactive and on-going process. Hence, in this model, the concept of ‘impact’ is reduced rather to ‘an outcome at any particular time’, which is both shaped by what has gone on before and itself shapes future outcomes.

The paper argues that the impact of an information system cannot be described in terms of a single stable and predictable outcome, but only as a non-linear on-going process that changes and evolves over time.

2.3.6 Attitudes to Change

A wealth of literature exists concerning the management of change and the need to emphasise and encourage positive attitudes within the workforce if the change process is to achieve maximum effect. Boddy and Buchanan (1992) suggest three main change styles: imposition; education and communication; and participation. Clarke (2001) identifies the need for the latter two of these styles to be assisted through a supportive and participative framework. Carnall (1990) also identifies the need for involvement:

“People need to understand the new system if they are to understand their own part in it.”

Much of the literature relating to information systems emphasises the functional nature of change as a result of introducing a new information system. However, the concept of an information system as an agent of cultural change is an important one.

“Information Systems are frequently used as ways of introducing attempted changes to organisation culture by managerial groups.”

Beynon-Davies (2002)

This was certainly a major intention within the 1999 Information Strategy of Chester College, where the explicit intent was for the creation of an ‘open information culture’ and for the enabling of information delivery to be electronic rather than paper-based or face-to-face.

A number of authors (Clare & Stuteley 1995, Beynon-Davies 2002) extend the concept of expectation failure, introduced in 2.3.2, and suggest that an absence of user satisfaction may actually lead to stakeholder resistance in applying a new system. At best Beynon-Davies identifies the use of strategies such as ‘lying low’ and being ‘too busy’ to learn to use the system, but, potentially, resistance strategies can extend even to sabotage, where a user, working alone or with others, may attempt to force a scrapping of the implemented system.

Page (1996) suggests that the impact that a new system has on an organisation’s culture may be identified along a spectrum of attitudes, ranging from complete rejection and refusal to co-operate through to being welcomed with open arms and total enthusiasm (Figure 2.3 overleaf).

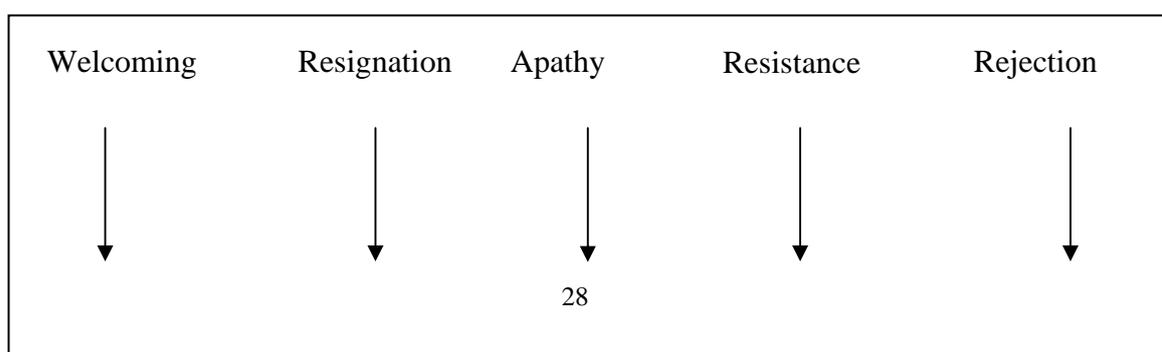




Fig 2.3: A spectrum of attitudes to cultural change (*Page 1996*)

2.3.7 Information Overload

One consequence of developing information systems based upon networked computer technology is that people increasingly have additional information presented to them. The specific introduction of internet-based systems (and in particular electronic mail facilities) has markedly increased the rate at which many companies now present information to their employees, with the expectation that they will be able to cope with and manage it.

Whilst this is often considered by managers to be a major benefit in that employees are ‘empowered’ to a greater extent, for some employees and groups there can be a marked negative effect.

“In the information age, there can be too much exposure and too much information. There is a danger that too much stuff cramming in on peoples’ minds is just as bad for them as too little, in terms of the ability to understand, to comprehend.”

Bill Clinton (cited in Brown 2000)

The term ‘information overload’ has become the commonly adopted term for the over supply of information leading to negative effects, though various authors also use the terms ‘information fatigue’, and ‘information anxiety’. Lewis (1996) identified that information overload causes *“mental anguish and even physical illness”* in staff at all levels, and typically leads to a significant fall in employee productivity and a lessening ability to analyse for decision making.

Identifying quite why information overload should cause stress has been the subject of much research, though studies often focus on the problem of being unable to assimilate large amounts of information prior to decision making, and of being concerned that critical information is ‘out there somewhere’, but has been missed.

“Information anxiety is produced by the ever widening gap between what we understand and what we think we should understand ... Information anxiety is the black hole between data and knowledge.”

Wurman (1990)

Lewis (1999) suggests that the placing of a work colleague or group in an information overload situation can also enable another individual or group to exert power or influence. For example the posting of a discussion document on an intranet can lead to decisions being made even though key players have not had an opportunity to input if their attention has not been drawn to the document amongst the maelstrom of other competing information.

A Reuters research study (Lewis 1996) surveyed 1300 managers across a wide geographic area and across a range of levels in different industry sectors. The analysis reported a 40-60% positive response to each of the various questions relating to personal perspectives of information overload. The report concluded that information overload is a very real phenomenon in the workplace, and that many people have not developed personal strategies for coping with it.

2.3.8 Specific e-mail Issues

A majority of companies have increasingly focussed on the introduction of e-mail for internal communications between workgroups and individuals as a key element in their information strategies. Such a policy has many virtues:

“Electronic mail was ... the dominant form of communication within the company for intended actions such as following up earlier communications, communicating something complicated to someone far away, communicating the same thing to many people and keeping someone informed.”

(King and McAulay 2002)

However the introduction of e-mail facilities and culture has resulted in a number of unintended consequences. King and McAulay undertook a questionnaire study of a group of 70 managers in a global company. The analysis suggested that many in the study group appeared to be using electronic mail for performing actions that the authors considered would have been more effective had alternative forms of communication been used.

Many authors (e.g. Gordon and Gordon 1999, King and McAulay 2002) comment on the common misuse of electronic mail facilities. This includes, for example, personal use of the facility outside of company policy, use of the facility in an unethical or immoral way, or (as suggested by the study of King and McAulay) use for illegal

purposes. Such 'misuse' can produce effects both positive (on morale, for example, where staff may not be monitored for the sending of personal e-mails to friends and family, provided that such use is not excessive) and negative (where there are many recorded instances of receipt of unwelcome e-mails and attachments, particularly by female employees). The monitoring of employees' e-mails to detect and eradicate misuse raises a number of legal and ethical questions, but the practicalities of volume make it virtually impossible for any company to do so as a regular part of operations.

King and McAulay summarise three areas of unintended consequences in the use of electronic mail suggested by their research:

1. Depersonalisation: within the paper the authors apply the principles of 'information richness theory' to their questionnaire results, and draw the conclusion that many managers make use of the less personal approach offered by e-mail communication rather than a more appropriate face-to-face or telephone communication, even when conveying confidential or delicate information, or when requiring a fast response.
2. De-effectivisation: the authors argue that e-mail offers an individual new ways of less-obviously pursuing personal activities which would be more easily seen as time-wasting if carried out face-to-face or by telephone, e.g. the sharing of jokes and games. This naturally leads to a loss of effectiveness in the workplace.
3. Distractions: the use of e-mail, particularly when used for personal reasons such as on-line purchasing, inevitably leads to inclusion on mailing and distribution lists, and the subsequent receipt of 'spam', mostly unwanted invitations and offers, but which can tempt sufficiently to cause a distraction from the focus of work. However, many workers also adopt a practice of copying e-mails to others only peripherally concerned with the subject matter 'to cover their backs', and so users receive a flood of e-mails which are of marginal relevance or of no importance to them, but these then require time to view before they can be determined as irrelevant and deletable.

Kimble et al. (1998) expand upon the depersonalisation issue by identifying that 'computer mediated communications' (of which e-mail is the prime example) often fail to provide a context for the information content, and that the inherent information content may therefore be lessened. They suggest that the provision of contextual clues, such as facial expressions or arm movements in face-to-face conversations and emphasis or pauses in a telephone conversation, provide a context for interpretation of

the message, so making issues less ambiguous, providing immediate feedback and involving several senses.

“The implication is that media that lack information richness and social presence do not provide the contextual clues necessary for ‘quality’ person to person communication.”

They comment further that to partially address the problem the linguistic device of ‘emoticons’ has found some favour; however, these seem to be actively discouraged in many work situations, as a flippant and non-professional addition to ‘serious’ communication.

Dudman (2003) further discusses the problems caused by the increase in e-mail traffic, and in particular the need to address it as a corporate, rather than an individual, responsibility. In particular she identifies two issues:

1. The poor practices adopted by many users of e-mail in managing their own personal archive. Dudman suggests that the majority of these are unnecessarily large, as users are unwilling to delete files, as they might do with a written memo; this can lead to serious storage demands at the I.T. level. However the archives are also usually unstructured, making the necessary location and retrieval of a communication difficult to accomplish.
2. The loss of information to a company. Dudman suggests that employees are far more willing to ‘fire off an e-mail’ than to start a threaded conversation within a bulletin board or discussion forum, even where these exist and are easy to use. She quotes Hugh Banister of Premier Oil:

“The problem we have with e-mail is not just overload, but knowledge management. ... We were just haemorrhaging information.”

2.3.9 IS Culture Gap

Many authors (e.g. Remenyi et al. 1998, Benyon-Davies 2002) refer in their writings to an ‘IS Culture Gap’, a tension between information system developers and information system users, arising from major gaps in mutual understanding and communication. Benyon-Davies suggests that system design benefits markedly by having end-user participation and he points to a range of benefits including:

- the information system being a closer match to the requirements of users and stakeholders
- the information system being a closer match to the human activity system
- the securing of a greater level of commitment to the system by users.

2.3.10 Other Relevant Issues

Health Risks: The issue of health risks associated with increased computer usage is well documented (e.g. Laudon and Laudon 2002). They cover a range of medical problems, some of which are physically proven (e.g. repetitive stress injury), some of which have been investigated but not proven (e.g. screen radiation damage to cells), and others which relate to mental conditions (commonly summed up as ‘technostress’).

Property Rights: The ‘ownership of data’ problem is discussed by a number of authors. Legally all information generated by an employee or workgroup is owned by the company, or as Robson (1997) puts it “Data is a corporate and not a parochial asset”. However many people see themselves or their workgroup as having ‘rights’ over what they produce. In an open-information culture such personal ‘rights’ are seriously eroded. Moreover, any information openly published on a corporate intranet is much more easily liable to be made available externally through deliberate or unintentional action by someone other than the author. Laudon and Laudon (2002) discuss this issue at some length, identifying a number of distinct moral dimensions, but summarise by saying that “*contemporary information systems have severely challenged existing law and social practices that protect private intellectual property*”. This clearly presents a dilemma for staff who relinquish almost all control over their authored material when it is published on an intranet.

2.4 Summary

This chapter has identified that, although business theory says that all projects should be post-evaluated, this rarely occurs meaningfully in practice for projects in the area of information systems. The chapter has suggested a number of reasons why evaluation of the success or failure of an IS implementation is difficult to undertake in practice, but has identified a number of areas in which relevant questions might be asked, from which an identification of benefits might be determined.

In particular the chapter has identified that assessment can be made at two levels: firstly an assessment of *use*, but just as importantly, of *impact* on individuals, workgroups and the organisation as a whole.

In discussing what is meant by 'impact' the importance of recognising cultural change is noted, and of the range of attitudes that this can engender amongst users. It is also noted that the introduction of an information system can have both intended and unintended consequences, which can be viewed as positive or negative variously by different stakeholders. The views of a number of authors have been presented as to where impact can be observed, but it is noted that such observations would change and evolve over time.

A number of specific impact areas have been presented in more detail: information overload, e-mail, the IS culture gap, health issues and property rights.

Chapter 3

Methodology

3.1 Introduction

Chapter 3 discusses the methodology used for primary data collection. The overall approach taken is deductive in that theories suggested in the literature are being compared to the results gained through a qualitative study of the perceptions and attitudes of a sample group of academic staff. The method employed to collect primary data is that of a structured questionnaire, but this was informed by discussion and semi-structured exploratory interviews, so, in this sense, is multi-method.

The chapter also presents a detailed account of how the interviews and questionnaires were implemented.

3.2 Methodological Considerations

3.2.1 Justification for the Selected Paradigm and Methodology

Following completion of the literature survey a broad list of areas which were relevant to the research problem were identified, using not only the ideas contained within the literature but also drawing on points which had been raised internally at Chester College IBIS User Group meetings. This list was considered by two members of the IBIS User Group for content to ensure that it did indeed cover the areas that the group had implicitly or explicitly in its current brief. The final version of this document is attached as Appendix B.

Because the list of potential impact areas was so extensive it was necessary to consider how organisational data could be gathered meaningfully in order to be able to draw conclusions about specific impacts on individuals, workgroups and organisations (after Beynon-Davies 2.3.5).

The report previously produced for the Information Strategy Committee (Appendix A) and an initial application of value chain analysis (as suggested in 2.3.3 and detailed in

4.3) indicated that the use of IBIS was widespread across the institution. The potential population from which data could beneficially be collected consisted therefore of virtually all staff and students currently within the institution, and possibly some external individuals such as governors and examiners, around 8000 people.

At this point it was decided to narrow the sample from which data would be collected. Following discussions with members of the Information Strategy Committee it was agreed that the most flexible and widespread use of IBIS was by academic staff. In order to make an assessment of impact over a period of time it was agreed that it would be most useful to collect data from a sample of academics who met the sole criteria of having been in full-time employment at College prior to the introduction of IBIS and were still employed now. No distinction would be drawn as to whether the subject was male/female, nor of which academic department they worked in, nor of their seniority, nor of their use of IBIS as perceived by the researcher (since most such staff would be known to the researcher).

In consultation with the Human Resources Management Services department a sample of 55 academic staff were identified as meeting the criteria. This group is described in section 4.3, and contained a number of Heads of Department as well as lecturing staff.

A further group of staff within the School of Nursing and Midwifery potentially met the criteria, but, because the majority of their work was hospital based where IBIS has only recently been available, it was decided not to include these in the sample. Consequently the sample included only two from that School who have been solely Chester campus based.

Similarly it was decided to reject a number of lecturers within the School of Education because it was considered that a major part of their work was focussed on and based at primary and secondary schools. The sample included therefore only five from that School.

The method adopted for the main primary data collection was through a self-administered postal questionnaire. This approach would be time-effective in that a large number of responses could be sought within a short timescale, and would produce results which, because of the structured nature of the questionnaire, could be easily analysed.

The literature survey suggested that the introduction of an information system could have unintended impacts, as well as those intended (2.3.5), and it was felt to be important to identify these if at all possible. This was approached in two ways. Firstly, questions were included on the forms of an open nature, inviting the respondent to give their own comments, both within individual sections of the questionnaire and on two final summary pages. However, it was felt that this was insufficient, as respondents might well not pull something to mind without a prompt.

In an effort therefore to determine unintended impacts, and with a secondary purpose of assisting the researcher in constructing and phrasing the questionnaire, semi-structured interviews were arranged with three people. All three were members identified in the sample group who were known to be active in using and (in one case) influencing the development of IBIS. The guide questions used for these interviews are attached as Appendix C.

The final questionnaire distributed to the sample group is attached as Appendix E. It was structured into 8 distinct sections, preceded by a detailed explanation of why it was being circulated and what it was hoped to learn from the answers. Each section had a clear title and a short introductory paragraph. The majority of the questionnaire was based around tick-box answers across a Likert-type scale of perceptions; this assisted analysis of the responses, as well as making the collection of a lot of data possible in a relatively short space of time.

Analysis of responses was by hand-collation, which was possible given the relatively small size of the sample.

3.2.2 Rejected Methods

An alternative method of data collection discussed at an early stage in this study was the potential for the extensive use of structured interviews with individuals and semi-structured discussions with workgroups. Whilst it was considered that this would potentially produce data of a more personal and direct kind it was felt that the demands on time to undertake a meaningful number of interviews and discussions effectively would rule this out. Another consideration was the potential problem in collating a substantial amount of unstructured data into a meaningful analysis.

3.3 Research Procedures

The three exploratory semi-structured interviews were carried out in the middle two weeks of March 2003, with academic staff who were members of the identified sample group and who were known by the researcher to be active in their use of IBIS. Each person was asked to attend for between one and one-and-a-half hours in a room where telephones and computers were silenced and where the door carried a 'Do Not Disturb' notice. Coffee and tea were provided to produce a relaxed atmosphere. An initial introduction to the purposes of the interview and a guarantee of anonymity preceded the substantive discussion about the impacts that the interviewee felt IBIS had had on himself (all three were male), his department and the College. The questions listed in Appendix C were available to the interviewer only for guidance and for ensuring completeness, but, in practice, all interviewees were allowed to set the flow of the discussion with only general direction and prompting from the interviewer.

The three interviews took respectively 85, 60 and 75 minutes. Comments made by each interviewee were recorded in longhand, and each interviewee was offered a copy at the end; no-one took up this offer. After all three interviews the comments were incorporated into new and rephrased questions on the questionnaire.

Considerable care was taken in putting the questionnaire together to ensure that the design was professionally presented, so helping to emphasise the importance of completion, by, for example, including a colour logo on the front page and the use of varied fonts.

The questionnaire was distributed on April 17th 2003 by placing a paper copy, in an individually addressed envelope, in each of 55 pigeonholes (including those of the interviewees who had all agreed to participate) by hand.

The day prior to this, April 16th, each recipient received an individually addressed e-mail (Appendix D) explaining that they were about to receive a questionnaire, explaining the importance of it to College planning, and encouraging them to take part by completing and returning to the researcher within two weeks (i.e. by May 2nd 2003). During the following week some 17 e-mail responses were received from recipients agreeing to take part, or apologising for not being able to meet the deadline because of

planned commitments and asking if a later submission was acceptable. Although the first e-mail asked for those who did not wish to take part to let the researcher know of this, in fact no-one did.

When the forms were distributed each one was headed with the recipient's name, a hand-written "thanks!" and the researcher's first name. This was (a) to encourage return by personalising the form, so making it seem more special, and (b) in the hope that forms would be returned with this information intact so that respondees could be logged before the forms were anonymised.

On May 1st, the day prior to the deadline, a standardised 'chasing' e-mail was despatched to those from whom a response could not be identified, either because a form had not been returned or because the front sheet had been removed.

By the end of May 2nd 45 forms had been returned. 5 further forms were returned over the following 9 days, yielding a success rate of 50 out of 55 (91%).

It is the intention to send a short 'thank you' to all members of the sample group together with a précis of the conclusions reached through the research, towards the middle of June 2003.

3.4 Ethical Considerations

Many of the ethical considerations which impact upon business research are considerably lessened or removed when the research is carried out internally to the organisation by a researcher who is employed by the organisation (Saunders et al. 2000).

However care was taken to ensure that the conduct of the exploratory interviews and the design and handling of the questionnaires followed established ethical principles.

For the interviews the participants were asked to volunteer, were given the option of declining, were fully appraised of the purpose of the interviews, and were not forced into discussing areas that they would have been uncomfortable with (though no such areas were observed in practice). All participants were offered a copy of the researcher's notes made during the interview, though all, in practice, declined. The

interviews were used solely for the purpose of refining the questionnaire and no statements or comments are used elsewhere in this research.

The final questionnaire was seen and approved before issue by two members of the Information Strategy Committee. Although each questionnaire was individually addressed by name this was solely for the purpose of logging their return, and names were removed after so doing. All analysis has been 'grouped', so ensuring anonymity, except for certain individual's comments which are particularly pertinent but which have been quoted only where it is considered that an individual cannot be identified.

One ethical issue considered was whether to admit to participants that the research project was being used for an MBA dissertation as well as for a very real organisational purpose. Following discussions with senior management within the organisation it was felt that nothing was to be gained by this, that possibly it might deter some people from taking part in the study, and that no-one would be harmed in any way by keeping this information from them.

3.5 Summary

The potential areas of impact identified by the literature survey were amplified through the use of open discussion and three exploratory semi-structured interviews. From these, a series of Likert-style questions were designed to test perceptions and attitudes which, together with a small number of open-ended and factual questions, resulted in the production of a questionnaire. This was issued to a selected sample group of 55 academic staff across the institution.

The analysis of responses is undertaken in Chapter 4.

Chapter 4

Findings

4.1 Introduction

Chapter 4 describes the questionnaire used for data collection and contains the analysis of responses, either in tabular form or as a summary of free-form comments made by respondents. The findings are then applied to the research question in Chapter 5.

4.2 Research Design

The questionnaire (Appendix E) was designed to be completed specifically by academic staff within Chester College who were full time employees both currently and pre-IBIS in 1999. In order that perceptions and attitudes could be tested in a way which would lead to easy analysis it was decided to use a Likert-type scale for the main body of data collection, but also to allow for the collection of free-form comment where the respondent wished to add it. A final section asked respondents to identify what, for them, were the three major positive and the three major negative impacts of the introduction of IBIS in a free-form way.

The title page of the questionnaire incorporated a colour logo, used bold headings and had clear instructions for return to the researcher. Also on this front page were thanks from the two groups who will receive copies of the research findings.

Preceding the questions was an introduction designed to remind the reader why IBIS was originally introduced, to explain what the current situation was regarding IBIS within the institution, and to explain the purpose of this questionnaire. Clear instructions for completion followed, with contact details in case of query.

Each of the following 8 sections was designed to a common format with a clear heading and instructions in order not to confuse the respondent.

Section 1 of the questionnaire sought basic information about the respondent in terms of:

- status / job role
- level of institutional involvement and responsibility

- self-assessed level of computer literacy
- involvement with formal computer literacy training (via the European Computer Driving Licence, ECDL)
- involvement with the College’s information systems training activities.

The section of the 1999 Information Strategy that discussed training needs for the new information systems to be introduced recommended that all staff should secure the ECDL award. It would be a reasonable assumption that, if a member of staff were active in the use of IBIS and keeping up with on-going developments, they would have undertaken basic computer literacy training and be attending in-house training activities regularly.

Section 2 asks respondents to make an assessment of their current use of IBIS across a selected number of areas in terms of their frequency of use. These areas were chosen as being broadly representative of the main information sources which the majority of users might reasonably be expected to engage with.

The first area, for example, ‘the main News pages’, is now virtually the sole way of drawing the attention of all members of college, both staff and students, to events happening within the institution, to problems, such as planned system downtime or office closures, and for drawing attention to, for example, major procedural changes. ‘Insider’ (question 15) is a monthly newsletter summarising the major events which have happened in the College’s life. Both of these are readily accessed and replace earlier paper systems.

Questions 16, 17 and 18 (‘forms’) relate to the attempt within the information system to dispose of paper forms which fall out-of-date, to be replaced by downloadable forms which can be accessed as and when required in a known-to-be-current version.

Sections 3, 4 and 5 seek the respondent’s views on how IBIS has changed, respectively, themselves, their workgroup and their organisation (following Beynon-Davies’ model discussed in 2.3.5). The specific attitude and perception areas were derived from the various issues raised during both the literature search and the exploratory interviews (discussed in Chapter 3). Additional questions were asked in section 3 relating to the amount of time spent working at a computer (for whatever purpose, not necessarily

interacting with IBIS), and whether IBIS has permitted users to work more from home (using a facility within the information system called 'IBIS@home').

Section 6 picks up on a number of areas that relate to broader perceptions as to the impact of IBIS on staff generally. A subsidiary question asks about the respondent's perception of the impact on staff who do not have access to IBIS e.g. gardeners, cleaners, catering staff. (This is queried in the light of the comment above regarding the main 'news' pages).

Section 7 requests the respondent to make a personal assessment of the impact of IBIS across a range of perceptions. Whilst it was recognised that this question was likely to cause difficulties for many participants it was decided not to include a 'don't know' column in order to avoid offering an 'easy option'.

Section 8 asked the respondent to identify what, for them, were the three major positive and the three major negative impacts of IBIS, suggesting that they might wish to duplicate earlier statements but that new ones would be equally valid.

A final page was appended in order to give all respondents the chance to add further comments, thoughts and ideas.

4.3 Application of Methodology

Prior to the analysis of the questionnaire returns an assessment of use was undertaken following the methodology suggested by Curtis and Cobham (2002) and others (discussed in section 2.3.3). Applying Value Chain analysis to Chester College's introduction of web-based information systems (Figure 4.1) suggests that there has indeed been an impact in all areas. This point will be returned to in Chapter 5. As discussed in Chapter 3 it was recognised that a survey of perceptions across all areas would be outside the scope of the current exercise and that therefore the survey would be carried out only on a selected sample of academic staff, chosen for having been in full-time employment both currently and prior to 1999 when IBIS was introduced.

Human Resource Management	Database system; Vacancy info and forms on WWW and IBIS				
Corporate Infrastructure	Systems for Finance, student records, documents, e-mail, library access				
Technology Development	Work of CITS/LRSS/IBIS Co-ordinators/Network Infrastructure				
Procurement	On-line ordering systems, marketing information systems				
Inbound Logistics	Student Recruitment – direct UCAS data, statistics, offers, information on programmes	VLE Learning and Teaching Support, WWW access, discussion forums, SITS	Careers information and services, Awards ceremony systems	On-line CV's, website of student availability / employer vacancies	Alumni system, on-line College news
Operations					
Outbound Logistics					
Marketing and Sales					
After Sales Service					

Fig 4.1: A Value Chain Analysis of Chester College's Implementation of Web-based Information Systems

Table 4.1 analyses the overall response rate to the survey:

Questionnaires Issued	55
Questionnaires Returned	50
Response Rate	91%

Table 4.1: Analysis of Overall Response Rate

The questionnaires were issued widely across departments within the College (this is discussed in detail in 3.2.1), as indicated in Table 4.2. Respondents were not required to identify themselves or their department within the questionnaire, however the questionnaires were issued with the person's name on the cover sheet, which only four people removed prior to return.

	Issued	Returned
Computer Science	6	6
Geography	5	4
Mathematics	3	3
Psychology	5	4
PE/Sports Science	4	4
Social & Communication Studies	3	2
Biology	6	3
English	1	1
Fine Art	5	5
Theology	2	2
History	3	3
Modern Languages	3	3
Performing Arts	2	2
Nursing & Midwifery	2	1
Education	5	3
Anonymously returned		4
Totals	55	50

Table 4.2: Analysis of Issue / Return by Academic Department

The high response rate, both overall and across departments, is attributed to:

- staff of the institution being genuinely interested in making IBIS better and more successful
- the survey being carried out by an internal researcher
- the survey being designed for a real purpose (i.e. its findings are to be considered by the Information Strategy Committee and the IBIS User Group)

- the use of an e-mail message to pre-warn staff to expect the questionnaire
- the professional appearance of the questionnaire
- the use of a ‘chasing’ e-mail the day prior to the return deadline.

The analysis of questionnaire tick boxes was undertaken by hand collation to separate spreadsheets for each question. Summated results are included in section 4.4. Free-form responses were collated by section and are used, where appropriate in full or summary form, in section 4.4.

4.4 Findings for Each Research Question

Within section 4.4 only the analysis of the questionnaire responses is undertaken in (mostly) numeric form. The interpretation of these findings in relation to the points raised within the literature survey and against the research problem, question and objectives is made in Chapter 5.

4.4.1 Questionnaire Section 1 – “About You”

When designing the questionnaire it was decided to include questions relating to the respondent in order to have the opportunity to be able to analyse attitudes and perceptions in relation to a person’s job role and their responsibilities.

The first question in this section asked for the respondent to identify their status. All respondents were either lecturers or Heads of department:

	HoDs	Lecturers	Other
Questionnaires Issued	12	43	0
Questionnaires Returned	12	38	0
Response Rate	100%	88%	0%

Table 4.3: Analysis of Response Rate between Heads of Department and Lecturers

The second question asked respondents to make a self-assessment of their level of involvement and responsibility within the institution, in terms of cross-College and Department roles (Table 4.4). Not surprisingly all Heads of Department ranked themselves in the highest category. No staff ranked themselves in the lowest category; since all respondents have worked within the institution for at least 4 years this is

perhaps a good indication that the institution is making a good use of its more experienced staff.

	HoDs	Lecturers	All
significant and wide cross-College and department roles	12	4	16
some cross-College and department roles		23	23
some department roles but no cross-College ones		11	11
few or no additional roles			0
all	12	38	50

Table 4.4: Analysis of respondents' level of involvement and responsibility

It is College policy that all academic (and appropriate administrative and support) staff should attain a basic level of formal computer literacy in order to be able to make the most effective and efficient use of both the hardware resource and the software tools and information systems towards which the College is focussing. Table 4.5 summarises the stage at which the 50 respondents in the survey claim to be (from question 4) in relation to the European Computer Driving Licence.

	HoDs	Lecturers	All
completed all sections	1	13	14
enrolled and in progress	2	4	6
intend to enrol	4	8	12
do not intend to enrol	5	7	12
degree in Computing		6	6
all	12	38	50

Table 4.5: Analysis of involvement with European Computer Driving Licence (ECDL) programme

Despite all respondents having been members of staff for at least 4 years it is observed that only 20 out of 44 (excluding those with degrees in computing) have so far completed or are in progress. It is perhaps more worrying that 12 staff do not intend to enrol. One respondent appended the comment "I do not intend to enrol *again*. I did enrol but found it too frustrating and pitched at the highest common denominator, not the lowest. I prefer to muddle on my own".

Table 4.6 draws a correlation between respondents' level of self-assessed responsibility (as in table 4.4) and the involvement with the ECDL.

	significant roles	college and department	department only	All
completed all sections	2	6	6	14
enrolled and in progress	2	3	1	6
intend to enrol	5	6	1	12
do not intend to enrol	7	5		12
degree in Computing		3	3	6
all	16	23	11	50

Table 4.6: Analysis of involvement with European Computer Driving Licence (ECDL) programme according to respondents' level of involvement and responsibility

This reveals that of the 24 staff yet to begin a computing qualification 23 claim to have both cross-College and departmental roles.

Question 3 asked respondents to self-assess their level of computer literacy across three categories (Table 4.7). Despite the lack of formal training involvement with IT for 48% (24/50) of the sample, all staff claim to be 'okay' or better in basic tasks and everyday applications, though 58% (29/50) claim to be 'poor' or worse in more advanced applications.

	Expert	Competent	Okay	Poor	Very poor
for basic tasks (e.g. e-mail, web searching, navigating)	13	30	7		
for everyday applications (e.g. word processing, spreadsheets).	11	25	14		
for more advanced applications (e.g. web authoring, databases)	6	9	6	16	13

Table 4.7: Respondents' self-assessed level of computer literacy

The 5 levels in table 4.7 were ranked 5 (for expert) to 1 (for very poor) and totals were summed for each respondent, yielding a 'self-assessed computer literacy score' from 15 (expert in all 3 categories) to 3 (very poor in all three categories). Table 4.8 correlates these scores against involvement with the ECDL.

ECDL \ Literacy Score:	7	8	9	10	11	12	13	14	15
completed all sections	1			5	2	3	1	2	
enrolled and in progress	1	2	2				1		
intend to enrol	2	1	3	3	2				1
do not intend to enrol	1	3		4		3			1
degree in Computing						1	1	1	3
all	5	6	5	12	4	7	3	3	5

Table 4.8: Analysis of involvement with ECDL against respondent's claimed computer literacy score

The table suggests that staff who have completed the ECDL rank their computer literacy skills higher than those who have not.

The final question in section 1 asked respondents to rank how frequently they attended the information systems training activities provided by College (such as the 'Show-and-Say Café' sessions). These provide virtually the only formal opportunity for academic staff to engage with the learning of new systems. Table 4.9 summarises the results.

	regularly	occasionally	rarely	never
HoDs		8	3	1
Lecturers	4	24	5	5
All	4	32	8	6

Table 4.9: Attendance of respondents at training events

It is notable that 28% (14/50) of the respondents claim to attend such sessions only 'rarely' or 'never', but particularly that this includes 33% (4/12) of the Heads of Department who took part.

4.4.2 Questionnaire Section 2 – "Your Use of IBIS"

The second section of the questionnaire was designed to determine the level of usage made by respondents of a range of facilities available under IBIS. The range was selected to be representative of the broader spectrum currently available, from those which have been active for some time. Table 4.10 summarises how the 50 respondents divided themselves amongst the usage categories (including 'no response') for each facility.

Please could you make an assessment of your <u>current</u> use of IBIS and its associated facilities and functions. How regularly do you use IBIS for accessing:	Hourly	Daily	Every 2/3 days	Weekly	Monthly	Less than monthly	Never	No response
	1. the main “News” pages	3	18	10	7	8	3	1
2. committee agendas	0	0	3	6	18	10	10	3
3. committee minutes	0	0	0	10	16	10	11	3
4. module reading lists	0	0	3	4	9	26	7	1
5. module learning materials	0	5	4	9	13	11	7	1
6. module discussion forums	0	2	1	5	1	7	30	4
7. e-mail	27	16	0	0	0	0	7	0
8. Student Information System for student details (e.g. addresses)	1	4	8	10	4	14	9	0
9. Student Information System for student module profile/marks	1	3	9	10	6	9	11	1
10. the library catalogue	0	6	12	16	6	8	1	1
11. your personal library borrowing record	0	1	2	5	11	9	21	1
12. other library/LRSS pages	0	2	3	3	18	15	8	1
13. the Quality Assurance Handbook	0	1	4	4	13	26	2	0
14. the Staff Handbook	0	0	1	1	8	30	10	0
15. “Insider”	0	0	1	5	12	24	8	0
16. forms from Finance	0	0	1	1	11	17	19	1
17. forms from HRMS	0	0	0	5	10	18	17	0
18. forms from other areas	0	0	0	3	9	26	12	0
19. salary scales	0	0	1	1	4	12	32	0
20. the Student Handbook (“Chester CD Rom”)	0	0	1	1	7	26	14	1
21. the Document Manager or I drive	0	4	1	7	2	11	25	0
22. “IBIS @ home”	0	6	2	7	4	6	24	1

Table 4.10: Respondents’ use of IBIS (Questionnaire section 2)

As expected, e-mail was the most frequently accessed facility with 86% (43/50) of the sample using it at least daily. However the remaining 14% (7/50) claim never to use it.

The two sources of College news were used with considerable variation. The ‘current news’ on the main menu screen was read at least weekly, the accepted usual posting time, by 76% (38/50) of staff in the sample, whilst the more detailed monthly news roundup, “Insider”, was read by 84% (42/50) at least sometime. This suggests however that a considerable proportion of staff is either missing out on news postings or is receiving such information from other sources.

The results across most of the categories would suggest that the majority of staff are aware of the facilities and use them on an ‘as required’ basis. Certain features are used less frequently, such as the support of module learning spaces with the Document Manager system and use of discussion forums.

It is noteworthy, though, that the two questions which queried the use of the Student Information System each received a number of comments at the side suggesting that the respondent was not permitted to access that facility. Similarly, three comments by the side of the last question suggested that the facility to access the information system from home was not understood by a number of staff.

4.4.3 Questionnaire Section 3 – “How has IBIS changed You?”

Section 3 sought to ascertain perceptions and attitudes for impact on the respondents as individuals. The section also contained three short tick-box questions that are analysed first.

Each respondent was asked to self-assess the number of hours spent working at their computer each week (summarised in Table 4.11), and then to compare this to the number of hours they remembered working 4 years previously (Table 4.12).

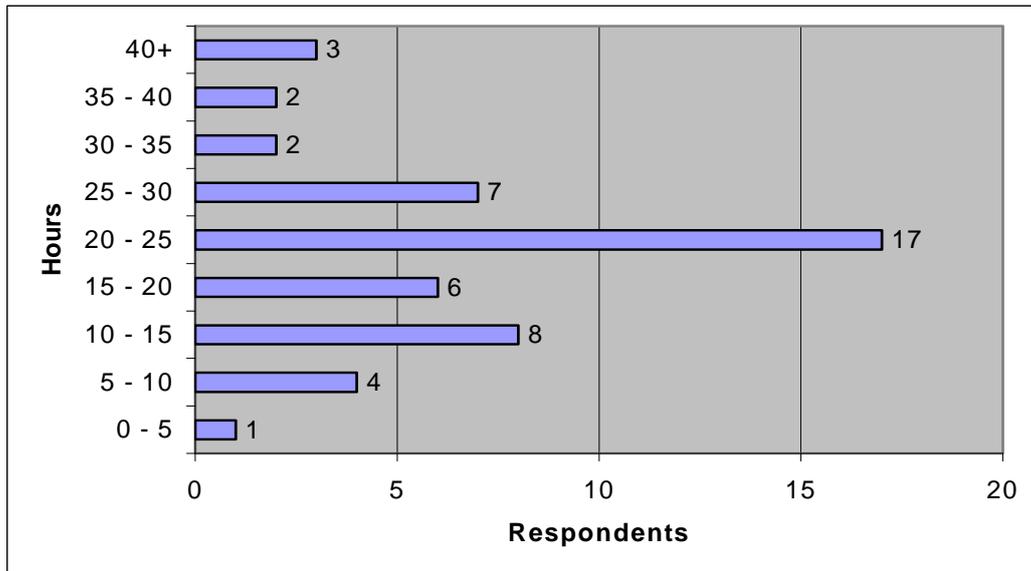


Table 4.11: How many hours do you spend working at your computer each week?

	HoDs	Lecturers	All
A lot more	2	16	18
More	8	12	20
Same	2	9	11
Less		1	1
totals	12	38	50

Table 4.12: How does the number of hours you spend at your computer now compare to that of 4 years ago?

The modal usage rate was found, for the sample, to be 20-25 hours each week, with 62% (31/50) of respondents exceeding 20 hours. 76% (38/50) claimed that this was ‘more’ or ‘a lot more’ than 4 years previously. The proportion claiming ‘a lot more’ was substantially different between Heads of Department (17% - 2/12) and lecturers (42% - 16/38); it is suggested that this may be because of the introduction of learning support space within IBIS for each module, which lecturers, because they support more modules than Heads of Department, are therefore more likely to spend time on developing.

The third tick-box question related to whether IBIS had permitted staff to spend more of their working week at home. Partly this related to the introduction of the IBIS@home facility, but the results suggest that it has yet to make a significant impact on the potential for teleworking (Table 4.13).

	HoDs	Lecturers	All
frequently	1	1	2
occasionally	1	14	15
no	10	23	33
totals	12	38	50

Table 4.13: Has the introduction of IBIS enabled you to spend more of your working time at home?

The major part of section 3 is summarised in Table 4.14, by summing responses within each category for each question, including a ‘no response’ column.

You are asked to consider what impact the introduction of IBIS has had on you personally over the period 1999-2003. (Try to ignore other factors as much as you can). Please select the most appropriate response to each statement:	Strongly agree	Agree	No change	Disagree	Strongly disagree	No response
1. I am much better informed about college generally	6	24	16	4	0	0
2. I am much better informed about activities in college	6	25	15	3	1	0
3. I am much better informed about changes in college	4	18	22	3	2	1
4. I am much better informed about people in college	2	21	19	5	3	0
5. I am much better informed about committee decisions	1	19	24	5	1	0
6. I am much better informed about rules and regulations	2	22	20	4	2	0
7. I am much better informed about college strategy	1	18	23	7	1	0
8. I am much better informed about college policies	1	18	23	6	2	0
9. I have a better relationship with students	1	9	23	12	5	0
10. I have a better relationship with workgroup colleagues	2	7	28	8	4	1
11. I have a better relationship with staff outside my workgroup	2	10	23	9	4	2
12. I am able to provide a better learning experience for my students	9	26	9	5	1	0
13. I have improved my level of Personal skills	4	23	18	3	2	0
14. My level of overall job satisfaction is higher	3	10	19	10	6	2
15. I feel I have become more ambitious	2	6	20	18	4	0
16. I have some health concerns	1	9	16	14	8	2

Table 4.14: How has IBIS changed you personally? (Questionnaire section 3)

Of the 16 questions posed in this section it can be seen that the first 15 can be perceived as ‘positive’, i.e. that a response of ‘agree’ or ‘strongly agree’ would suggest a positive impact of IBIS on the individual, whilst the last question is posed in a ‘negative’ sense.

The first 8 questions asked the respondent to assess the level to which they were informed about various aspects of college life. The majority of responses were positive or neutral suggesting that many individuals do feel that introducing IBIS has led to them being better informed.

The following three questions asked about relationships. Responses to each question were split across each category, with slightly more suggesting a negative trend than a positive for those who expressed that a change had occurred.

Responses to question 12, “I am able to provide a better learning experience for my students”, were strongly positive, and the positive response to question 13 relating to personal skills probably correlates to this as new techniques and skills have had to be learned to make use of the new facilities.

The large numbers of respondents replying negatively to questions 14 (33% - 16/48) and 15 (44% - 22/50), relating to job satisfaction and ambition, suggest that there may be some cause for concern.

The final question, relating to health concerns, was answered positively by 21% (10/48) of respondents, though one respondent did append the comment “Should I???”, suggesting perhaps that health concerns relating to the use of computer workstations were not appreciated by all.

4.4.4 Questionnaire Section 4 – “How has IBIS changed your Workgroup?”

Each individual was asked to consider the impact that IBIS had had on their workgroup since its introduction. For all respondents their workgroup would have been their department, though one respondent did comment that, because of cross-College responsibilities, this could have been defined in another way with different answers.

Ten statements were presented which respondents were asked to rank to a five-point scale. Table 4.15 summarizes the responses (with an additional column added for ‘no response’).

You are asked to consider what impact the introduction of IBIS has had on your workgroup (department, functional area, or team) over the period 1999-2003. (Try to ignore other factors as much as you can). Please select the most appropriate response to each statement:	Strongly agree	Agree	No change	Disagree	Strongly disagree	No response
1. Communications within the group have improved	4	25	14	5	1	1
2. Personal interactions within the group have improved	2	5	28	11	4	0
3. The group is more independent as a result of having open access to information	1	21	20	6	1	1
4. Methods of working within the group have changed	5	26	17	0	1	1
5. Methods of working within the group have changed for the better	3	21	19	7	0	0
6. My workgroup has an increased say in information systems development (through the IBIS co-ordinators)	0	18	19	11	1	1
7. The introduction of IBIS has reduced the need for ad-hoc systems of working.	1	12	21	13	2	1
8. My workgroup has a better understanding of its place within college	0	15	25	8	0	2
9. My workgroup better understands its aims and objectives	0	9	31	9	0	1
10. My workgroup better understands the aims and objectives of the college	0	17	22	10	0	1

Table 4.15: How has IBIS changed your workgroup? (Questionnaire section 4)

The first two questions solicited perceptions related to communications and personal interactions. A majority of those who expressed that a change had occurred were markedly positive for communications having improved (59% - 29/49) with only 12% (6/49) disagreeing. Personal interactions though were felt to have worsened by 30% (15/50) of respondents against only 14% (7/50) who felt they had improved.

The following two questions asked about methods of working within the group. 63% (31/49) considered that IBIS had led to changes with 48% (24/50) considering that these changes were for the better and 14% (7/50) feeling they had been made worse.

The responses to question 6 suggest that 37% (18/49) see their workgroup being better able to influence the direction in which information systems move within College, though 24% (12/49) feel that their influence has decreased.

Prior to the introduction of a standardised web-based information system across the College many departments had developed their own ad-hoc systems, for example, a departmental student database system. Question 7 asked if the introduction of IBIS had reduced the need for this. 27% (13/49) agreed, 30% (15/49) disagreed (so implying that they considered there was now an increased need for ad-hoc systems), and 43% (21/49) felt that there had been no change in the need. So 73% (36/49) consider that ad-hoc systems are needed at least as much as prior to IBIS.

The final three questions in this section asked about perceived understandings of the workgroup in relation to college and within itself. Overall there were no strong feelings as to whether or not IBIS had helped the workgroup to better understand its own aims and objectives (question 9). However, in the understanding of college objectives (question 10) and the workgroup's place within the institution (question 8) there was slightly more agreement gained for each than disagreement as to whether IBIS had had a positive impact.

This section offered respondents the opportunity to append free-form comments and 17 individuals did so.

Two respondents noted that they were based in small departments and that they considered the impact of IBIS on their workgroups, where staff were based in contiguous offices, to have been minimal.

Two respondents commented at length about the varied level of computer literacy skills within their workgroups and the problems that this causes. The first stated that the impact of IBIS "can be entirely dependent on the computer literacy of others within the department. Often find that everything needs to be sent twice, once on e-mail etc and then once again on paper so the 'few' have equal access. ... Staff should have no complaints if they have not ... accessed e-material, and something needs to be done about this". The second commented that "not all of my colleagues are confident in their computer user skills. So many things that the group might do are not done because some members would not cope". Two further respondents noted that "Academic staff

are not (in many cases) willing to use methods of working which involve computers” and that “IBIS is not used regularly by most department members”.

Several respondents comment about how the use of e-mail has ‘improved’ communications within their workgroup, but two note that “communications may be more frequent but that does not improve the quality of understanding within a group”, and that “ ... less personal contact is detrimental to the cross-fertilisation of ideas”.

4.4.5 Questionnaire Section 5 – “How has IBIS changed the Organisation?”

Section 5 of the questionnaire asked respondents to broaden their viewpoint to take in the whole organisation, and to try to identify what impact IBIS has had at this level.

Table 4.16 summarises the responses.

You are asked to consider what impact the introduction of IBIS has had on Chester College as an Organisation (or Business) over the period 1999-2003. (Try to ignore other factors as much as you can). Please select the most appropriate response to each statement.	Strongly agree	Agree	No change	Disagree	Strongly disagree	No response
1. Cross-college communications have improved	10	29	9	2	0	0
2. Personal interactions within college have improved	1	18	19	11	1	0
3. College feels more like a University now	0	20	18	8	2	2
4. College feels more efficient as a business	1	20	16	9	1	3
5. College feels over-regulated	9	17	16	8	0	0
6. Information to aid decision-making is much improved	0	31	14	5	0	0
7. Management decision making has improved	1	11	23	10	1	4
8. College has improved its advantage over competitors	1	11	27	6	0	5
9. The public image (esp. to prospective students) has improved	4	35	8	3	0	0
10. Information has become more accurate and consistent as a result of integrating systems (e.g. timetabling and SIS)	5	30	9	4	1	1
11. The college is more susceptible to risk from legal liabilities (e.g. data protection)	3	22	15	8	0	2
12. The college is more susceptible to risk from criminal activities (e.g. hacking)	2	28	15	4	0	1
13. The college is more susceptible to risk from system failure (e.g. power failure)	13	31	5	1	0	0

Table 4.16: How has IBIS changed the organisation? (Questionnaire section 5)

The section consisted of 13 questions, of which 9 are phrased in a 'positive' way (questions 1 to 4 and 6 to 10) i.e. agreement would signify a positive impact, whilst 4 (questions 5 and 11 to 13) are phrased 'negatively', i.e. agreement would signify a negative impact.

Question 1 asked about cross-College communications; 78% (39/50) agreed that IBIS had made a positive impact whilst only 4% (2/50) disagreed. 38% (19/50) also considered that IBIS had made a positive contribution to the improvement of personal interactions, though 24% (12/50) disagreed (question 2).

Questions 3 and 4 asked respondents to assess their perception of the institution as a professional organisation. Respectively 42% (20/48) and 45% (21/47) considered that IBIS had contributed to making the institution feel more like a University and an efficient business.

The next question, does "College feel over-regulated", elicited a strong response, with 18% (9/50) strongly agreeing with the statement and 34% (17/50) agreeing.

Questions 6 and 10 relate to the information itself within the system, whilst question 7 asks if the respondent feels that management decision making has improved as a result of implementing IBIS. Question 6 produced a 62% (31/50) positive response and question 10 a 71% (35/49) positive response; however 10% (5/50 and 5/49) in each question considered that information to aid decision making had worsened and that information had become less accurate and consistent. Despite these high positive responses question 7 suggests that only 26% (12/46) considered that management decision making had improved while 24% (11/46) felt it had worsened.

Question 9 produced a very positive response, with 78% (39/50) considering that the investment in web-based information systems had improved the institution's public image. However, question 8 caused difficulties for a number of respondents, several of whom appended comments to the effect that, despite a positive answer to question 9, it was more a matter of 'running to keep still'; 27% (12/45) still responded positively but 13% (6/45) negatively.

The final three questions were included to assess respondents' perceptions of risk as a result of introducing IBIS. All three elicited strong positive responses, particularly the last (88% - 44/50) which would have the most direct impact on individuals.

Section 5 included a free-form response area, which 6 respondents used, though responses were, in the main, simply explaining why tick-box answers had been given.

4.4.6 Questionnaire Section 6 – “Broader Perceptions”

Section 6 included 9 questions grouped around the heading of ‘broader perceptions’, as well as a question on accessibility to the system. These questions were largely derived from issues identified during the literature survey.

Results were summated as previously, as Table 4.17.

You are asked to comment on your perceptions across a range of areas in regard to the introduction of IBIS. IBIS and its associated systems have led to staff in general being:	Strongly agree	Agree	No change	Disagree	Strongly disagree	No response
1. Swamped with too much information	9	20	14	7	0	0
2. More informed about college activities	2	35	9	4	0	0
3. More “involved” with college	0	18	22	10	0	0
4. Asked to do more	8	32	8	2	0	0
5. More monitored as to their activities	2	16	26	5	0	1
6. More stressed	6	20	17	5	0	2
7. More in control of their activities	0	14	22	12	2	0
8. Better informed	2	34	11	3	0	0
9. More aware of activities in other departments	2	23	21	3	1	0

Table 4.17: Broader perceptions of the impact of IBIS (Questionnaire section 6)

Whilst some perceptions reflect positive impact others can be viewed negatively, though some answers (such as that to question 5) could be seen either way depending on viewpoint.

Questions 1, 2, 8 and 9 relate again to the provision of information. The positive responses to 2, 8 and 9 (respectively 74% - 37/50, 72% - 36/50, 50% - 25/50) indicate that IBIS has led to staff in general being better informed. However, this would appear to be at the expense of information overload, as indicated from the first question where 18% (9/50) strongly agree and 40% (20/50) agree with the assertion that staff are swamped with too much information. This theme is returned to in 4.4.8.

Respondents suggested that IBIS had had a negative impact in that it had raised peoples' workloads (question 4, 80% - 40/50), had increased stress amongst staff (question 6, 54% - 26/48), and had led to staff being subject to a higher level of monitoring (question 5, 37% - 18/49).

The results from question 3 suggested that respondents were fairly evenly split as to whether IBIS had led to staff becoming more 'involved' with College (36% - 18/50 agreeing and 20% - 10/50 disagreeing, but with no 'strong' opinions).

Similarly the results from question 7 suggest that respondents were evenly split as to whether staff were more or less in control of their activities as a result of introducing IBIS (28% - 14/50 both positive and negative).

The supplementary question appended to section 6 sought to test respondents' views on whether they felt a sub-culture was developing within the institution of staff who were in some way disadvantaged by not having ready access to IBIS. Table 4.18 summarises these responses.

no – they receive the information in other ways	13
partially agree	29
strongly agree	8
total	50

Table 4.18: Has the introduction of IBIS created a sub-culture of people who do not have access to the system?

Three respondents who replied 'strongly agree' to this question appended further comment, including one who thought that it was a matter that the unions should become involved with as a matter of urgency. 74% (37/50) either partially or strongly agreed with the question.

4.4.7 Questionnaire Section 7 – “Assessing IBIS”

The final tick-box asked respondents to make a personal assessment of IBIS under 13 headings. Each question is phrased in a positive sense, i.e. agreement with the statement would indicate a positive impact. Results are summated, as previously, in Table 4.19.

You are asked to assess a number of statements made in regard to IBIS: IBIS has been:	Strongly agree	Agree	No change	Disagree	Strongly disagree	No response
1. a powerful driver for changing processes	5	24	13	6	0	2
2. an enabler for an “open information” culture	3	32	8	5	0	2
3. a major factor in changing the broader institutional culture	2	26	13	8	0	1
4. an effective tool for enhancing a student’s learning experience	9	27	5	8	0	1
5. an effective tool for management	3	27	14	5	0	1
6. an effective aid to decision making	0	14	26	7	0	3
7. a tool to make staff more efficient	2	25	14	8	1	0
8. a tool to make staff more effective	1	26	16	6	0	1
9. a help to widening access and participation (WAP)	1	25	16	5	0	3
10. a challenge for staff	10	32	2	5	0	1
11. embraced by all staff	0	4	6	33	6	1
12. a cost-effective project	3	19	8	9	1	10
13. worthwhile	11	30	4	3	1	1

Table 4.19: Respondents’ assessment of IBIS (Questionnaire section 7)

With one exception (question 11) the responses to each question were weighted heavily towards either a positive or neutral impact, negative responses being in the range of 8% (question 13, 4/49) to 25% (question 12, 10/40). Question 12 caused difficulty for many respondents who commented that they had no idea what the costs were!

Question 11 returns to a theme identified in 4.4.4. In response to the question “has IBIS been embraced by all staff” only 8% (4/49) were able to answer positively, with 12% (6/49) strongly disagreeing.

Only two respondents appended free-form comments within this section, both of whom made equivalent statements. Quoting one of these: “In many cases I would add the rider ‘potentially’. IBIS could be used to improve things in these ways but I’m not convinced that the potential has yet been realised”.

4.4.8 Questionnaire Section 8 – “The major impacts of IBIS”

The final section asked respondents to identify what, for them, had been the three major positive and the three major negative impacts achieved through the introduction of web-based information systems. 47 of the 50 returned questionnaires contained comments in this section, in various levels of detail.

Under ‘positive impacts’ most respondents simply listed the facilities that they used most frequently, i.e. e-mail, the library catalogue, the student information system, etc. Many also commented however on the ready availability of information in a general sense. Three respondents commented that, for them, having consistent and up-to-date information was a major impact, or as one Head of Department expressed it, “the possibility of us all reading from the same hymnsheet”. The value of having ready access to student information at their desktop was ranked highly by a number of tutors who stated that their ability to counsel and advise students had been much enhanced.

The capability to present learning support materials through IBIS was highlighted by around half of respondents, though a number of these indicated that they felt there was much progress still to be made.

Two respondents prioritised the developmental influence that IBIS can have: “it puts our departmental efforts in focus and highlights where we need to develop”.

Several respondents picked up on the ready availability of committee meeting agendas and minutes: “this has made the College much more democratic” and “it has made committee work more open”.

Under ‘negative impacts’ the most frequently stated comments were focussed around (a) the problems of navigation through so much information, and (b) the difficulties caused by (perceived) frequent system failures, particularly of e-mail facilities. It is clear that the majority of respondents does not find the existing navigation and search facilities either easy or intuitive to use, and this appears to be having an off-putting effect on some: “finding things on IBIS can be a nightmare”. The fact that system failures are causing so many problems for users is both a positive indication that IBIS is being used and a negative indication that the College has become dependent on these and that there are few, if any, backup non-computer based systems in place.

Although ten or so respondents reiterated the topic of information overload several suggested that, were navigation improved to allow better selectivity, this would not be so much of a problem. A number seemed resigned to the problem, and considered that IBIS was only one element amongst many. Several highlighted the various problems associated with e-mail, in particular, the proliferation of ‘copies’ and ‘spam’, both of which “still required my time to decide they were not needed”.

Several picked up on the assumption made by both managers and administrators that “because it’s on IBIS everyone has seen it”. Two Heads of Department and three lecturers observed that they were not made aware when new information and facilities were added to IBIS, only finding out when they were told explicitly when seeking the information from elsewhere, or by accident when browsing: “people need to be told when things change”.

Despite the positive impact identified earlier made by the incorporation of learning support spaces within IBIS, several respondents also identified this as one of their major negative impacts. Comments included: “an uneven use of IBIS by students means that there is no guarantee that all have seen/consulted materials”; “in some cases students view IBIS as a substitute for teaching activity”; and “IBIS has led to a kind of spoonfeeding attitude and little improvement in commitment to individual improving understanding (*sic*)”.

Four people commented on how electronic systems seem to put pressure on them to respond quickly, e.g. “the e-mail facility has increased the tendency for people to expect things to be done at short notice”.

Personal feelings were often mentioned in this section: "... frustration when my skills are inadequate ..."; "... guilt if I feel I'm not using it enough ..."; "... constantly guilty that I do not know how to do things with IBIS ...". Whilst the word 'stress' was used by ten or so respondents, only one mentioned a health problem specifically – "eyesight!".

The final topic that occurred in a number of responses was the impact that IBIS was perceived to have had on personal relationships, both staff-staff and staff-student. Several lamented this, and one particularly highlighted the reduction in personal contacts between teaching staff and administrative/support staff, particularly in central service areas.

Broadly, however, this section did not produce any surprises, though the comments were interesting to read, particularly in the strength of emotion expressed by some.

A final page was appended to the questionnaire for final comments which respondents might like to make. Only 6 people used this section, mostly to re-emphasise earlier comments that they had made. The researcher though welcomed one comment: "This survey is needed!"

4.5 Summary

The response rate to the questionnaire was high and the quality and fullness of the answers indicated that respondents had given considerable time and attention to the exercise. On this basis it is felt that the analysis of responses can be treated with some credibility.

In chapter 5 conclusions are drawn from the data analysis and implications are identified.

Chapter 5

Conclusions and Implications

5.1 Introduction

This chapter looks back upon the research exercise and the methodology used and critically evaluates it in the light of experience. With this as context the results emerging from the study are pulled together in order to draw conclusions about the specific research question posed in 1.2 and the wider research problem identified in the same section. Implications arising for Chester College, whether for workgroups, for individuals, for systems or for the institution as a whole, are identified from these conclusions. In Chapter 6 an implementation plan is proposed to address the implications.

Also contained within chapter 5 is an identification of the limitations of this study, and, arising from this, identification of where further research may be advantageous for the institution and, possibly, for other users of intranet systems.

5.2 Critical Evaluation of Adopted Methodology

The methodology adopted, i.e. that of exploratory interviews followed by the issue of a literature-informed questionnaire produced a substantial return of information. The subsequent analysis was facilitated by the use of Likert-type responses for the assessment of most attitudes and perceptions. Some use was made of free-form textual responses in order to allow respondents to identify areas of concern outside the defined question areas.

The rate of return was unusually high for a questionnaire of this form and length. Saunders et al. (2000) suggest various ways of improving return rates and securing co-operation of participants, and these (and others) were used wherever possible. Essentially the questionnaire was issued with an emphasis on the value of the study in relation to the work of the individual and their organisation, and this seems to have been recognised by respondents in the level of detail included in free-form comments. Saunders et al. also suggest that return rate is influenced according to the competency

and credibility of the researcher, and the profile of the researcher as Chair of the Information Strategy Group was almost certainly of benefit.

The greatest difficulties identified in the use of questionnaires where a Likert-type scale is used is in ensuring that (a) questions are clearly understood by the reader, and (b) that the question is asked free of bias. In retrospect it is considered that some questions may have benefited from a little more explanation for participants who are still at an early stage in their use of IBIS. In order to try to avoid undue bias, 'positive' and 'negative' impacts were mixed within the questions, but not in equal ratios.

The major concern of the researcher in interpreting responses was to the extent to which each respondent had been able to exclude other factors than IBIS from their considerations. Higher education has been subject to numerous external drivers and influences during the period 1999-2003 and each of these has impacted to a lesser or greater extent on the areas investigated within this study. A number of respondents did identify the problems that they had experienced through their free-form answers, but others may have gone by their 'gut feel' rather than by isolating the IBIS contribution. A particularly good example of this might be questionnaire section 5 question 5: "Do you feel that IBIS has resulted in the College being over regulated?"; it might be difficult for respondents to separate the tool being used to apply the regulation from the driver causing it.

5.3 Conclusions about the Research Question

The analysis of responses to the questionnaire suggest that the introduction of web-based information systems at Chester College has had significant impacts on individuals, on workgroups and for the organisation as a whole. However, the impact has not been evenly felt for a number of reasons.

It would appear from the answers given to questionnaire sections 2 and 3 that the facilities and functionality of IBIS are recognised by the majority of staff. The recognition that the institution has moved to an 'open information culture' is evident in many responses, particularly from the free-form comments given within section 8. However, it is also clear from the answers that many individuals perceive the management of the content within the system to be poor, leading both to difficulties in

navigation and in identifying what the system actually holds. This would appear to be reducing the positive impact of the system for many individuals.

The system is clearly being used by the majority of staff for at least some functions. The introduction of an e-mail system has had the greatest positive impact, with most staff using it daily. The replacement of wall-posted notices and pigeonhole memos by electronic news pages would seem to have been successful, with 76% claiming to browse the facility at least weekly; however, no questions were asked on the effectiveness of this information in affecting peoples' actions.

A majority of staff believes that information to aid decision making has been improved by the introduction of IBIS, a key objective in the information strategy. However, concerns were voiced by many staff that 'information overload' was apparent and was causing stress. This issue was particularly identified in relation to the poor (perceived) navigation in IBIS and to e-mail. That the quality of the information available, in terms of accuracy and consistency, has improved was recognised by 71% of respondents.

The analysis supports the assertion that communications (in its broadest sense) have improved across the institution and within workgroups. However, this would appear to be at the expense of a reduction in personal interactions; respondents noted this in staff/staff, staff/student and academic/administrative relationships.

The impact of IBIS on individuals who have embraced the 'digital firm' concept would appear to be quite marked, the responses to questionnaire section 2 indicating that many feel better informed and able to do their job more effectively. Similarly within workgroups the positive responses to section 4 indicate that IBIS is having a major impact and changing methods of working for the better.

The introduction of managed module learning spaces is providing the opportunity for academic staff to devise significantly improved learning opportunities for their students, and a number of respondents noted this as their 'number 1' impact area. Successful provision, though, is not attained without much input of effort. Several respondents noted potential negative impacts for student engagement when tutors do make this facility available (4.4.8) and these need to be understood by both tutors and students. The current usage of the broad range of facilities within this provision would appear to be variable across individuals and departments, and hence the impact is

largely focussed within small areas of operation; the potential for a very major impact should more (all?) academic staff embrace the concept is substantial.

An unintended consequence of the introduction of IBIS is that, as institutional information is progressively migrated for storage and management solely on to the computer-based system, all staff and students are becoming increasingly dependent on the infrastructure (both hardware and software systems) maintaining 24 hour 365 day functionality. The poor (perceived) reliability of the existing network, particularly with regard to e-mail, was identified as a 'major negative impact' by many respondents to questionnaire section 8.

IBIS would appear to have had a major impact on the way its staff now view the institution, with a substantial proportion of respondents attesting that business efficiency, the 'University' feel and the public image have all been enhanced since introducing the web-based systems.

The overall perception of IBIS derived from the analysis, particularly from questionnaire section 7, is that it is proving to be a powerful driver for change, that it is a powerful tool for enhancing efficiency and effectiveness, and that it is leading to cultural changes within the institution. Overall only 8% of respondents considered that the introduction of the system was not worthwhile.

However, only 8% of respondents agreed within questionnaire section 7 that all staff had yet embraced the IBIS concept. This is supported by responses across the questionnaire sections and does suggest that certain individuals are distancing themselves from the core body of information within the institution. Since IBIS is a growing system the result of this continual rejection is that they will fall further and further behind in their capability to interact with the system and inevitably grow less efficient and effective. The knock-on effect on colleagues was also identified by a small number of respondents, who reported the necessity for duplication of effort in an attempt to not exclude 'the few', and that workgroup effectiveness was being reduced because certain systems could not be applied unless used by all.

5.4 Conclusions about the Research Problem

The research problem was to determine whether or not the introduction of IBIS had had a beneficial impact upon Chester College and to determine if the project, as described in the 1999 Information Strategy, had met the desired outcomes.

This current research project has produced significant evidence to support the claim for beneficial impact. The desired outcomes, in terms of changing attitudes, culture and working practices have also been largely achieved at an institutional level. However, these statements need to be qualified.

IBIS was proposed as an information system for the whole institution to migrate to, throughout all academic, administrative and support areas, over a period of five years. It is surprising, then, to find evidence, 4 years into this development, that there are pockets of individuals and workgroups who are still:

- rejecting the offer of in-house training, whether for a formal qualification or for updating and skilling specifically on the in-house system
- doing so despite having significant levels of involvement and responsibility across College
- not using the main internal communication networks (i.e. e-mail and the main IBIS ‘news’ pages) on a regular basis, so isolating themselves from work colleagues
- generally not using the functionality which IBIS offers.

It is unfortunately outside the scope of this study to assess the degree to which the attitudes of this minority of academic staff are reducing the overall positive impact of the introduction of web-based information systems at Chester College.

5.5 Limitations of the Study

The exercise of Value Chain Analysis undertaken in section 4.3 suggests that the introduction of web-based information systems to the institution should have impacted upon every functional area, every stakeholder and every workgroup. The original thoughts for the research, having completed this exercise, were then to collect data from a horizontal cross-section of groups: academic staff, administrative staff, support staff, students, and possibly even ‘miscellaneous’ (i.e. governors, examiners). It became quickly obvious that this would have resulted in an unmanageable task.

So this study excludes many for whom IBIS would have had a major impact, likely to be of a different nature to that of the sample group.

Even within the heading of ‘academic staff’ this study has focused on one subset: staff who were employed full-time both now and prior to the introduction of IBIS. This subset is naturally biased towards people who can be seen as having more seniority within the institution (as suggested by the responses in 4.4.1). Also the age profile of the sample group is significantly older than that of the whole institution, and included many for whom the introduction of IBIS would be their first hands-on use of a major computer system.

The benefits of using this group were, though, that their potential use of the system would be wide, and not focussed on one or two aspects of it as would be the case for many administrators and support staff.

A further limitation to this study is that it asked people to remember back to a time 4+ years previous. It is broadly human nature to remember back to the ‘good old days’ and to see things in the past as better than they are now, with a rosy-glow halo. Although this does not devalue a study of current perceptions and attitudes significantly, such an approach may be perceived as non-scientific. However, in the absence of any historic data with which to compare, memories are all the researcher has to work with.

5.6 Opportunities for Further Research

The 50 questionnaires returned have been summated by individual question (i.e. horizontally) but no attempt has been made within this current study to look at the responses of each individual in a holistic way (i.e. vertically). This could be particularly useful in trying to understand why certain individuals are rejecting IBIS, as identified in 5.4. Furthermore, although question 1 asked respondents to identify their status and involvement/responsibility level, little use has been made of this information within the analysis of other sections; further analysis by groupings may produce additional conclusions.

Within the institution it would be interesting and valuable to broaden the study to include other groups of staff and to seek their attitudes towards IBIS and its perceived impact. Such groups could consist of, for example:

- recently appointed academic staff
- managers of non-academic functions
- administrative staff based in academic departments
- administrative staff based in non-academic departments
- support staff who have little (if any) hands-on interaction with IBIS
- the technical staff who support and structure IBIS.

Of particular interest were the comments received from respondents pointing out the huge negative impact caused within a workgroup of having colleagues who do not, for whatever reason, embrace new computer-based systems. There are a number of departments (at least two identified within this study) at Chester College where this would be the case. It would be a useful piece of research, of value to the informatics community generally, to focus on such a workgroup, and:

- to undertake an initial survey of usage and attitudes
- to retrain or train (forcibly if necessary) all staff within that workgroup in not only the technical skills necessary to be able to use the intranet effectively and efficiently as an individual, but also in its application to workgroup activities
- then to post-survey the group some months after such training.

Chapter 6

Recommendations

6.1 Recommendations and Implementation Plan

As a consequence of the conclusions reached in the previous section, four recommendations are now presented, each with a suggested plan for action.

System Navigation and Information Searching.

Nielson (2001) states:

“Thinking about the intranet as a productivity tool can prevent ... mishaps. For every service or application you put on the intranet, estimate the impact on users around the company ... The worst problem for intranet productivity is the time wasted navigating the site looking for information that, because of a poor design, is difficult to find.”

The responses to the questionnaire clearly indicate that IBIS impact is being seriously reduced because users find it difficult to access the particular information they need from the mass which is stored on the system. Nicholas (2002) suggests, however, that this is not simply a matter of tweaking menus and search engines:

“Successful management of information or content requires a fundamental understanding of an organisation’s purpose and processes so that the information flows can be mapped, and the data elements structured and classified.”

Recommendation 1 is therefore that the College should assign the appropriate resources to undertake such a mapping of information flows in order to more effectively structure and classify the data elements that are and will be incorporated into IBIS. It is strongly recommended that this should be undertaken with some urgency. The staff responsible for maintaining IBIS should then incorporate the findings of this work as soon as is feasible.

Reliability.

It is inherent in the philosophy of migrating to computer-based systems that the issue of risk must be fully addressed. In particular staff (and students in an educational institution) become increasingly dependent on a fully functioning network infrastructure, with an expectation that access will be maintained beyond times when

paper-based systems would be available. It is clear from the questionnaire responses that poor reliability is an issue with many respondents.

Recommendation 2 is that the Director of Information Technology Services should be requested to undertake an assessment of how system reliability can be increased, across (a) traditional working hours and (b) evenings and weekends. Such an assessment should include consideration of hardware, software and human resources. The Director should also be requested to monitor system outages and report these formally at each meeting of the Information Strategy Committee. Action suggested from the assessment should be in place by September 2003.

Engagement of all Staff

Section 5.4 identified that there were some academic staff who were failing to engage with IBIS to the detriment of personal and workgroup effectiveness and efficiency. In order to maximise the impact of IBIS and to achieve the maximum benefits for the institution it is necessary for these staff to be 'brought on board', but ideally in a way which is supportive rather than remedial or judgmental.

Recommendation 3 is that Heads of academic departments should be required to address the issue either at annual staff development interviews or through other appropriate opportunities in order to identify any problems which individuals might have with using web-based information systems. Heads should then set development targets for each individual to achieve within a set timeframe, including the completion of the ECDL qualification, in order to ensure the commitment of all staff. Each Head should identify workgroup IBIS training needs to the appropriate Dean, who will take the responsibility for assigning resources for this purpose. The aim will be to have an appropriate level of involvement with IBIS and a high level of commitment to it by all academic staff not later than January 2004.

Continuing Evaluation

Remenyi et al. (1998) state unequivocally:

"It is essential to have a meaningful and on-going evaluation of information systems and their benefits ..."

Recommendation 4 is that the Information Strategy Committee should be charged with the task of defining a mechanism for the on-going assessment and evaluation of IBIS,

and that reports resulting from this should be forwarded for the consideration of Senior Management. The objective should be to have this mechanism in place by October 2003.

BIBLIOGRAPHY

- Avgerou C. & Cornford T. (1993), *Developing Information Systems – Concepts, Issues and Practice*, Basingstoke: Macmillan
- Barnatt C. (1996), *Management Strategy and Information Technology*, London: International Thomson Computer Press
- Bennett R., Hamill A., Pickford T. & Rush L. (October 2002), *E-Learning in the School of Education at Chester College*, Chester College internal discussion paper
- Beynon-Davies P. (2002), *Information Systems – An Introduction to Informatics in Organisations*, Basingstoke: Palgrave
- Blaxter L., Hughes C. & Tight M. (2001), *How to Research 2nd edn*, Buckingham: Open University Press
- Bocij P., Chaffey D., Greasley A. & Hickie S. (1999), *Business Information Systems – Technology, Development and Management*, Harlow: Pearson Education
- Boddy D. & Buchanan D. (1992), *Expertise of the Change Agent*, London: Prentice Hall
- Brown J. (2000), *The Social Life of Information*, Harvard: Harvard Business Press
- Campbell C. (2002), *The Perfect Intranet*, in 'Internet Works', 63, Autumn 2002, p81
- Carnall C.A. (1990), *Managing Change in Organisations*, New York: Prentice Hall
- Carroll J.M. & Swatman P.A. (2000), *Structured Case: A Methodological Framework for Building Theory in Information Systems Research*, in *European Journal of Information Systems*, 9, pp 235-242
- Chester College (August 1999), *Meeting Information Needs: Developing an Information Strategy for Chester College 1999-2004*, Chester College internal strategy document
- Chester College (October 2002), *Information Strategy (revised)*, Chester College internal strategy document
- Clare C. & Stuteley G. (1995), *Information Systems – Strategy to Design*, London: International Thomson Computer Press
- Clarke S. (2001), *Information Systems Strategic Management*, London: Routledge
- Curtis G. & Cobham D. (2002), *Business Information Systems – Analysis, Design and Practice 4th edn.*, Harlow: Pearson Education
- Dearing R. (1997), *Report of the National Committee of Inquiry into Higher Education*, London: HMSO
- DeLone W.H. & McLean E.R. (1992), *Information Systems Success: the Quest for the Dependent Variable*, in *Journal of Information Systems Research*, 3(1), pp 60-95
- Dudman J. (2003), *E-Mail Overload*, in 'Computer Weekly', 15th April 2003, pp 36-37
- Gordon J.R. & Gordon S.R. (1999), *Information Systems – a Management Approach 2nd edn.*, Orlando: Dryden Press
- Johnson G. & Scholes K. (1997), *Exploring Corporate Strategy 4th edn.*, Hemel Hempstead: Prentice Hall

- Kimble C. & McLoughlin K. (1995), Computer-based Information Systems and Managers' Work, *in* 'New Technology, Work and Employment', 10(1), March 1995, pp 56-67
- Kimble C., Grimshaw D.J. & Hildreth P.M. (1998), The Role of Contextual Clues in the Creation of Information Overload, *in* Proceedings of the United Kingdom Academy for Information Systems 3rd Annual Conference, 'Matching Technology with Organisational Needs' April 1998
- King M. & McAulay L. (2002), Intentional Action and the Unintended Consequences of Electronic Mail, *in* Proceedings of the United Kingdom Academy for Information Systems 7th Annual Conference, 'Information Systems Research, Teaching and Practice' April 2002
- Lai V.S. & Mahapatra R.K. (1998), Evaluation of Intranets in a Distributed Environment, *in* Decision Support Systems, 23 (1998), pp 347-357
- Laudon K.C. & Laudon J.P. (2000), Management Information Systems – Organisation and Technology in the Networked Enterprise 6th edn., New Jersey: Prentice Hall
- Laudon K.C. & Laudon J.P. (2002), Management Information Systems – Managing the Digital Firm 7th edn., New Jersey: Prentice Hall
- Lewis D. (1996), Dying for Information, Reuters Research Report July 1996
- Lewis D. (1999), Information Overload, London: Penguin
- Nicholas L. (2002), Getting Best Value from Content Management, London: The Stationery Office
- Nielson J. (1993), Usability Engineering, Boston: Academic Press
- Nielson J. (2001), Intranets Save Time – But for Whom?, *in* Business 2.0, April 2001
- Owens I. (1999), Information Systems Evaluation: Current Themes, *in* Proceedings of the United Kingdom Academy for Information Systems 4th Annual Conference, 'Information Systems – the Next Generation' April 1999
- Page S. (1996), Organisational Culture and Information Systems, *in* Proceedings of the United Kingdom Academy for Information Systems 1st Annual Conference, 'The Future of Information Systems' April 1996
- Remenyi D., Sherwood-Smith M. & White T. (1998), Achieving Maximum Value from Information Systems, Chichester: Wiley
- Robson W. (1997), Strategic Management and Information Systems 2nd edn., London: Financial Times / Pitman
- Rockwell B. (1998), Using the Web to Compete in a Global Marketplace, New York: Wiley
- Saunders M., Lewis P. & Thornhill A. (2000), Research Methods for Business Students 2nd edn., Harlow: FT Prentice Hall
- Ward J. & Peppard J. (2002), Strategic Planning for Information Systems 3rd edn., Chichester: Wiley
- Wurman R. (1990), Information Anxiety, New York: Bantam

Appendix A
Progress in Implementing Chester College's
Information Strategy (a committee paper)

CHESTER COLLEGE of HIGHER EDUCATION

Progress in Implementing the College Information Strategy 1999 - 2001 (Presented to Information Strategy Committee 29th May 2001 by D.F. Holman)

Achieved:

- Establishment of the Information Strategy Committee, the IBIS User Group, School IBIS Co-ordinators and departmental IBIS link co-ordinators; and lines for communication / reporting.
- Audits of all hardware and software, initial and on-going.
- Audit for Y2K issues, and action to address potential problems.
- ECDL training programme established, College recognised as assessor.
- Considerable provision of other IS/computer-related training by LRSS, CITS and IBIS Co-ordinators.
- Considerable and increasing use of the Intranet for provision of learning and teaching materials.
- Recognition and use of IBIS as repository and first port-of-call for "Information" within College, e.g. for handbooks, committee agendas and minutes, course and programme information, policy documents, guidelines, news; menu and search facilities implemented.
- On-line "person" directory established (name, department, room, phone and e-mail).
- "IBIS@home" provision.
- Provision of access to IBIS at associated colleges, for Governors and for Examiners.
- Change in College culture to "open" provision of information.
- Data Protection Officer active in updating Register entry and College awareness-raising.
- Considerably enhanced high-specification hardware base throughout College.
- Establishment of a secure and reliable campus-wide computer network, with effective communication links to off-sites (Bluecoat, Hollybank, Chichester House, Vicarage, hospitals, etc.)
- Network Access extended to some Halls of Residence (ongoing programme).
- Computer conferencing facility enabled.
- Computer-based Timetabling implemented.
- On-line implementation of the P3 personal student portfolio.
- Policy for Web Publishing implemented, and Guidelines for authoring produced.
- Policy and Good Practice for e-mail and IS facilities implemented.
- Information Protection Policy produced and adopted.
- Provision of Out-of-Hours and Open Access to computer facilities reviewed.
- IT Policy for Students with Disabilities / Specific Learning Needs produced and adopted.

In Progress:

- Establishment of College (as distinct to department) bookable computer rooms.
- Installation of a Windows-based comprehensive Student Record System.
- Implementation of an On-Line Assessment Package for College-wide use.
- Formalisation of a Central Purchasing Policy for computer hardware and software (already working in practice).
- Adoption of consistent and coherent Microsoft applications and OS software across College.
- Implementation of Videoconferencing facilities and Distributed Video.

Outstanding: (main strategic areas only)

- Establishing of an IS Quality Cycle
- Establishing of and reporting from teams for IS analysis at local level
- Review of how IS can reduce the number and length of committee meetings

Recommendations for Updating the Strategy:

- a (green / environmental / social / cost-effective) policy for upgrading / replacement / relocation / recycling / scrapping of computers and peripherals is required.

Areas Considered for Interviews and Questionnaires

Involvement

How can/should we Quality Audit?

Are we being technology driven? as against need?

Impact on College Finances – large investment, high salary costs, large one-offs, ongoing

Lack of stakeholder involvement

External (Government) drivers

Satisfaction / Dissatisfaction

Adequacy of hardware and software

Availability of hardware and network

Does IBIS meet your expectations

Non-participants: “Luddites”

Cost-effectiveness?

Help facilities - support from CITS

More need for awareness of legal issues (DP etc)

System Outage problems

Vulnerability to Data loss

Virus susceptibility and false alarms

Have we improved existing systems, rather than undertaken a fundamental reassessment of what we want?

Security issues

Need for Disaster Planning

Are we getting differentiation or just keeping up

Vulnerability to crime (student access to db, blackmail...)

Increased staff turnover; difficulty in recruitment

Global recruitment

Health problems – technostress, rsi

Competitive advantage (5 force model, value chains)

Job Enrichment (admin, empowerment, upskilling)/ Impact on your role

Training issues

General Information source – ease of use

Daily information source

College background info source – Insider

Updates to info not apparent

Information Overload: plus e-mail usage, effects (errors/omissions, duplication, insecurity)

Impact on staff/student loyalty

Do staff better appreciate the value of information

Reduced Need for ad-hoc systems

Cultural issues and changes – are these beneficial?

Impact of effectiveness on peoples’ core functions

Are we getting **Knowledge** out of our IBIS?

Easier identification of problems (retention, degree classes, etc)
Information Convergence (multimedia)
Use of system for personal benefit, wasted staff time, legal issues
Teleworking potential
Enhanced tools for research

Social Interaction

Videoconferencing
Impact on Student Support and PATs – P3
On-line meetings, shared document potential

Power/Influence

Do you feel you have any say in defining IBIS
“Information Culture” concept
Is there over-emphasis on Management IS?

Work Visibility

Impact on public image
Intellectual Property Rights

Work Monitoring

Sense of being monitored? (of own on-line materials / HRM system)

The Future

Future – asset and access management
Future – less paper??

Academics

Use as a learning tool
Is this a suitable VLE for the future?

Administrative

Availability of info
integratedness

Support

Lack of access (eg gardeners, domestic, catering)

Students

reduction of staff input?
WAP
Potential to tele-study

External

Marketing issues

Other Areas to Consider

Content Management – best practices, alternatives, applicability

Guide Questions for Initial Interviews

1. Do you consider that the introduction of IBIS has moved us towards an Open Information Culture?
2. Have you been aware of any health impacts?
3. How have your social interactions and communications with colleagues changed?
4. How have your relationships with students changed?
5. Do you feel more or less a part of the Institution?
6. Do you feel more in touch with what is happening in College?
7. Do you feel more or less secure in your post?
8. What areas of using IBIS concern you most?
9. Have you required upskilling in order to fulfil your role?
10. Does putting your intellectual property onto IBIS concern you?
11. Do you feel you suffer from Information Overload? What strategies do you employ?
12. Has IBIS changed the way you work (eg from home)?
13. Are you aware of the legal implications of your use of IBIS?
14. Do you think the College's investment in IBIS has been worth while?
15. Do you think we have become more susceptible to crime?
16. Have we increased the "risk" to the institution? Have we assessed it?
17. Do you feel adequately trained to use IBIS?

Invitation to Participate and 'Chasing' e-Mails

Invitation to participate, sent on April 16th 2003:

From: .ac.uk>
To:
Subject: **Request for your help and a little time**
Send reply to:
Date Sent: **Wed, 16 Apr 2003 13:58:36 +0100**

Dear

I hate sounding like the Reader's Digest, BUT you really have been "carefully selected".... albeit it only by me, but against a number of criteria.

You will find in your pigeonhole later today a questionnaire relating to your use of and perceptions of IBIS and its impact on you, your department and the College.

The first page explains why I am asking you to take part in this survey, so I won't repeat it here.

I know you're busy (we all are) but PLEASE could I ask you to participate and return your response to my pigeonhole by Friday 2nd May. (This is a Bank Holiday and I will analyse over the weekend). Most responses are of the "tick-box" type.

If you are unable to take part please let me know (you don't have to give a reason) and I can seek another participant in your sample category.

Can I thank you personally in advance for your help - I'm very grateful.

Dennis
(as Chair of Information Strategy Committee)

Request to respond, sent on May 1st 2003:

From: **“Dennis” <d.holman@chester.ac.uk>**
Organisation: **Chester College of Higher Education**
To: **Friends, Colleagues**
Date Sent: **Thu, 1 May 2003 15:23:24 +0100**
Subject: **IBIS Questionnaire**
Send reply to: **d.holman@chester.ac.uk**
Priority: **urgent**

Dear friends and colleagues,

If you remember I dropped you off a questionnaire two weeks ago about IBIS. I've now had most of these back and will be spending much of this bank holiday weekend (predicted as wet and windy - perfect analysing weather!) to analyse them.

But it's not too late to return yours. I really am keen to get as close to a 100% return as possible given the small and carefully selected (really!) "representative" sample, so if you can return yours by next Tuesday or Wednesday I can still incorporate your feedback. Please complete it if you can - even if you don't use IBIS! This is exactly the sort of information I'm trying to find out.

(Apologies if you have already returned yours - some people took the precaution of tearing off the front named sheet, which is fine, and is precisely what I'm doing immediately on receipt anyway, but it means I can't tick you off my "returned" list. So sorry to trouble you again - but many thanks for taking the time to help).

Many thanks to you all
Dennis

Appendix E

**Questionnaire: An appraisal of the impact of IBIS
on Chester College 1999-2003**



CHESTER COLLEGE

An appraisal of the impact of IBIS on Chester College 1999-2003

Please return this questionnaire after completion to Dennis Holman via SCR pigeon-hole by 2nd May 2003.

Please accept the thanks of the Information Strategy Committee and the IBIS User Group for your valued assistance.

INTRODUCTION

Prior to 1999 Chester College's information systems were primarily paper-based and department-located. The introduction of IBIS (the College's Internet-based Information system) was designed to:

- integrate and rationalise all information systems within college
- engender an "open information" culture, where holders of information would need to justify its exclusion from the system
- present information to a common web-based format as far as possible.
- make all college information available to all staff, students and approved external individuals.

The Information Strategy Committee and the IBIS User Group have recently asserted that IBIS should remain College's information system infrastructure for at least two more years, and that we should continue to improve and extend its functionality. Whilst there has been considerable input of an operational and day-to-day nature from users (via departmental and school IBIS co-ordinators) to the IBIS User Group, no coherent exercise has yet been made to identify to what extent the introduction of IBIS has fundamentally changed our organisation and the people within it.

This questionnaire therefore seeks to:

- ascertain if the original aims for the introduction of IBIS have been met
- investigate how IBIS has impacted upon individuals, workgroups and the organisation as a whole
- identify what aspects of IBIS to date have not been wholly successful (with a view to correcting these before further enhancements)

It is being circulated initially to a carefully selected group of 55 people, all of whom have worked at College prior to 1999, and who are known to have varying roles and responsibilities. Because the group size is small and the sample has been carefully chosen can I **please** encourage you to complete the questionnaire and return it asap, but no later than Friday 2nd May to Dennis Holman's pigeon-hole in the Senior Common Room. (The analysis of all forms will be made over that Bank Holiday weekend). A separate exercise is being undertaken by CITS and the IBIS-UG to identify how users would like to see IBIS develop in specific ways in the future.

Instructions for completing the questionnaire:

We have tried to make the questionnaire easy to follow but on occasions there may be multi-choice questions where the answers do not precisely fit your situation. In an organisation as large and complex as Chester College it is unfortunately impossible to phrase a question in such a way that it fits everyone's situation perfectly. Please, try not to ignore any questions, but rather select the option which best seems to fit your individual perception; if you wish please append a qualifying comment against your response.

THANK YOU for your help. Your responses and comments **WILL** be taken into account in the coming months as we seek to develop and enhance information systems within our institution.

If you have any queries about this questionnaire please do contact Dennis Holman, ext 3095, d.holman@chester.ac.uk, Chritchley 1.10.

Section 1 : ABOUT YOU

1 What is your status / job role?

- Are you: a Head of Department
 or a Lecturer / Academic
 or other (please say _____)

2 Could you give an indication of your level of involvement/responsibility.

- Do you have significant and wide cross-College and Department roles?
 some cross-College and Department roles?
 some department roles but no cross-college ones?
 few or no additional roles

3 Could you self-assess your level of “computer literacy”

	Expert	Competent	Okay	Poor	Very poor
for basic tasks (eg e-mail, web searching, navigating)					
for everyday applications (eg word processing, spreadsheets)					
for more advanced applications (eg web authoring, databases)					

4 The European Computer Driving Licence (ECDL):

- Have you: completed all sections
 enrolled and in progress
 intend to enrol
 do not intend to enrol

5 Do you attend the information systems training activities provided within College (eg Show-and-say)?

- regularly occasionally
 rarely never

Section 2 : YOUR USE OF IBIS

Please could you make an assessment of your current use of IBIS and its associated facilities and functions.

How regularly do you use IBIS for accessing:

	Hourly	Daily	Every 2/3 days	Weekly	Monthly	Less than monthly	never
the main "News" pages							
committee agendas							
committee minutes							
module reading lists							
module learning materials							
module discussion forums							
e-mail							
*SIS for student details (eg addresses)							
SIS for student module profile/marks							
the library catalogue							
your personal library borrowing record							
other library/LRSS pages							
the Quality Assurance Handbook							
the Staff Handbook							
"Insider"							
forms from Finance							
forms from HRMS							
forms from other areas							
salary scales							
the Student Handbook ("Chester CD Rom")							
the Document Manager or I drive							
"IBIS @ home"							

*SIS = Student Information System

Section 3 : HOW HAS IBIS CHANGED YOU?

You are asked to consider what impact the introduction of IBIS has had on **you personally** over the period 1999-2003. (Try to ignore other factors as much as you can).

1 Please select the most appropriate response to each statement:

	Strongly agree	Agree	No change	Disagree	Strongly disagree
I am much better informed about college generally					
I am much better informed about activities in college					
I am much better informed about changes in college					
I am much better informed about people in college					
I am much better informed about committee decisions					
I am much better informed about rules and regulations					
I am much better informed about college strategy					
I am much better informed about college policies					
I have a better relationship with students					
I have a better relationship with workgroup colleagues					
I have a better relationship with staff outside my workgroup					
I am able to provide a better learning experience for my students					
I have improved my level of Personal skills					
My level of overall job satisfaction is higher					
I feel I have become more ambitious					
I have some health concerns					

2 How many hours do you spend working at your computer each week?

How does this compare to 4 years ago?

a lot more

more

about the same

less

3 Has the introduction of IBIS enabled you to spend more of your working week at home?

frequently

occasionally

no

Section 4 : HOW HAS IBIS CHANGED YOUR WORKGROUP?

You are asked to consider what impact the introduction of IBIS has had on your **workgroup** (department, functional area, or team) over the period 1999-2003. (Try to ignore other factors as much as you can).

1 Please select the most appropriate response to each statement:

	Strongly agree	Agree	No change	Disagree	Strongly disagree
Communications within the group have improved					
Personal interactions within the group have improved					
The group is more independent as a result of having open access to information					
Methods of working within the group have changed					
Methods of working within the group have changed for the better					
My workgroup has an increased say in information systems development (through the IBIS co-ordinators)					
The introduction of IBIS has reduced the need for ad-hoc systems of working					
My workgroup has a better understanding of its place within college					
My workgroup better understands its aims and objectives					
My workgroup better understands the aims and objectives of the college					

2 Any further comments / observations?

Section 5: HOW HAS IBIS CHANGED THE ORGANISATION?

You are asked to consider what impact the introduction of IBIS has had on Chester College as an **Organisation** (or Business) over the period 1999-2003. (Try to ignore other factors as much as you can).

1 Please select the most appropriate response to each statement.

	Strongly agree	Agree	No change	Disagree	Strongly disagree
Cross-college communications have improved					
Personal interactions within college have improved					
College feels more like a University now					
College feels more efficient as a business					
College feels over-regulated					
Information to aid decision-making is much improved					
Management decision making has improved					
College has improved its advantage over competitors					
The public image (esp. to prospective students) has improved					
Information has become more accurate and consistent as a result of integrating systems (eg timetabling and SIS)					
The college is more susceptible to risk from legal liabilities (eg data protection)					
The college is more susceptible to risk from criminal activities (eg hacking)					
The college is more susceptible to risk from system failure (eg power failure)					

2 Any further comments / observations?

Section 6 : BROADER PERCEPTIONS

You are asked to comment on your perceptions across a range of areas in regard to the introduction of IBIS.

1 IBIS and its associated systems have led to staff in general being:

	Strongly agree	Agree	No change	Disagree	Strongly disagree
Swamped with too much information					
More informed about college activities					
More “involved” with college					
Asked to do more					
More monitored as to their activities					
More stressed					
More in control of their activities					
Better informed					
More aware of activities in other departments					

2 A large number of staff employed by College do not have access to IBIS (eg cleaners, gardeners, catering staff). Do you feel that this has created a sub-culture within the institution where a substantial number of employees do not enjoy the same level of access to the body of information on IBIS?

- No – they receive this information in other ways
- Partially agree
- Strongly agree

3 Please add further comments if you can:

Section 7: ASSESSING IBIS

You are asked to assess a number of statements made in regard to IBIS:

IBIS has been:	Strongly agree	Agree	No change	Disagree	Strongly disagree
a powerful driver for changing processes					
an enabler for an "open information" culture					
a major factor in changing the broader institutional culture					
an effective tool for enhancing a student's learning experience					
an effective tool for management					
an effective aid to decision making					
a tool to make staff more efficient					
a tool to make staff more effective					
a help to widening access and participation (WAP)					
a challenge for staff					
embraced by all staff					
a cost-effective project					
worthwhile					

Section 8: THE MAJOR IMPACTS OF IBIS

This last section asks you to consider the major impacts which IBIS has had since introduction. These are open-ended responses and may duplicate earlier statements, but this question also allows you to make comments which have not arisen before.

Please identify what for you are the three main **POSITIVE IMPACTS** achieved through the introduction of IBIS to Chester College:

1 _____

2 _____

3 _____

and also what have been, in your view, the three main **NEGATIVE IMPACTS**:

1 _____

2 _____

3 _____

Please append any final comments which you think the Information Strategy Committee and the IBIS User Group may find useful. (Note: remember that a separate questionnaire will ask for ideas for specific enhancements to IBIS).