

**A Framework for  
Information Systems Management  
and Governance**

**Self-Assessment Toolkit**

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The authors would like to extend thanks to the following individuals who contributed to the development of this document:

The project's expert advisors:

- Dr. Peter West, Secretary to the University of Strathclyde;
- Mr. Martyn Harrow, Director of Information Services, Cardiff, University of Cardiff;
- Mr. Ray Corner, Director of Finance, University of Salford;
- Prof. Allan MacDougall, former Director of ISS at Kings College London and Visiting Professor, Dept. of Information and Communications, Manchester Metropolitan University;
- Prof. Wallace Ewart, OBE, former Pro-Vice-Chancellor and Dean of Business and Management and Director of Informatics at the University of Ulster.

The Project Steering Committee, and in particular:

- Mike Roch, Director of IT Services, University of Reading;
- Peter Tinson, UCISA Executive Secretary;
- Toby Bainton, Secretary, SCONUL;
- Adrian Officer, Estates Advisor, HEFCE;
- Dennis Barrington-Light, Project Director of the Student Information Systems project at the University of Cambridge;

The individuals and institutions that provided feedback on earlier versions of the toolkit:

- Dr. Leslie Beddie, Director of Information Technology Services, University of Durham
- Dr. Helen Fletcher, Head of Learning and Information Services, Buckingham Chilterns University College
- Dr. Louise Garden, Director of Learning Resources, Glasgow Caledonian University
- Ms. Hilary Johnson, Director of Information, Resources and Services, University of Northampton
- Mr. John Milner, Director MISD, University of Cambridge
- Mr. Mark Toole, Director of Information Services, University of Brighton
- Dr. Jim Wrightson, Director of Computing and Information Services  
Liverpool John Moores University

And to our JISC programme manager, Mr. Andrew Dyson.

A glossary of terms (highlighted in italics throughout this document) is included as Appendix A.

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## INTRODUCTION

### ***Information Systems Management and Governance in the HE Sector***

Investment in information systems constitutes a significant proportion of expenditure within higher education institutions (HEIs). However, as IT is usually embedded within a business process (i.e. teaching, learning, research or administration) it is often difficult for institutional governors to ascertain how much value these investments contribute to the institution's objectives. The concept of 'IT Governance' has emerged as a response to the growing pressure on organisations to ensure that they are achieving value for money from their IT and that investment is aligned to the organisation's objectives.

Recognising that none of the IT Governance frameworks developed for the private sector provided a good fit for the requirements of HE, JISC commissioned a team from the University of Strathclyde to develop a framework and toolkit to assist institutions in evaluating the management and governance of their information systems. To inform this development the team drew upon a number of sources:

- Extant frameworks for information systems management and governance, in particular, the Value for Money Initiative conducted by HEFCE in 1998.
- A survey conducted as part of this project which posed a range of questions to institutions about their approach to information systems management and governance. 111 responses were received from 98 institutions (multiple responses were accepted from institutions to reflect differences in perception). Unless otherwise stated the statistics quoted in this toolkit are derived from the survey.
- Reports and surveys developed by other sector support groups such as UCISA and SCOUNL.
- Relevant literature on the subject of information systems management and governance.

The draft framework and toolkit was then piloted in a number of HE institutions<sup>1</sup>, who provided valuable feedback which informed the further development of the framework and toolkit.

### ***A Framework for Information Systems Management and Governance***

Developing a perspective on information systems governance that has a clear scope and boundaries can be problematic – information systems and IT now underpin almost every activity within HE and therefore a large variety of systems have to be considered; systems cross organisational boundaries and consequently management structures can be complex; the use of information technology is often embedded in other processes making it difficult to review the effectiveness of single components such as IT.

In order to help resolve some of this complexity and to provide a structure for this toolkit the framework shown in Figure 1 was developed. The framework is built around five perspectives – governance, management, resources, structures and services. The framework takes a service-centred approach with the **services** delivered by the HEI's information systems at the centre of the diagram. These services use **resources** and are organised through the **organisation** structures that are put in place.

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<sup>1</sup> The following institutions took part in the pilot phase of the project: The University of Brighton, Buckinghamshire Chilterns University College, The University of Cambridge, Durham University, Glasgow Caledonian University, Liverpool John Moores University, The University of Northampton,

As reflected in the diagram the services, resources and structures are the primary components of information systems and IT **management**. The **governance** activity sits above and overlaps with management, and is primarily concerned with ensuring that management is effective and that activities are aligned to institutional priorities.

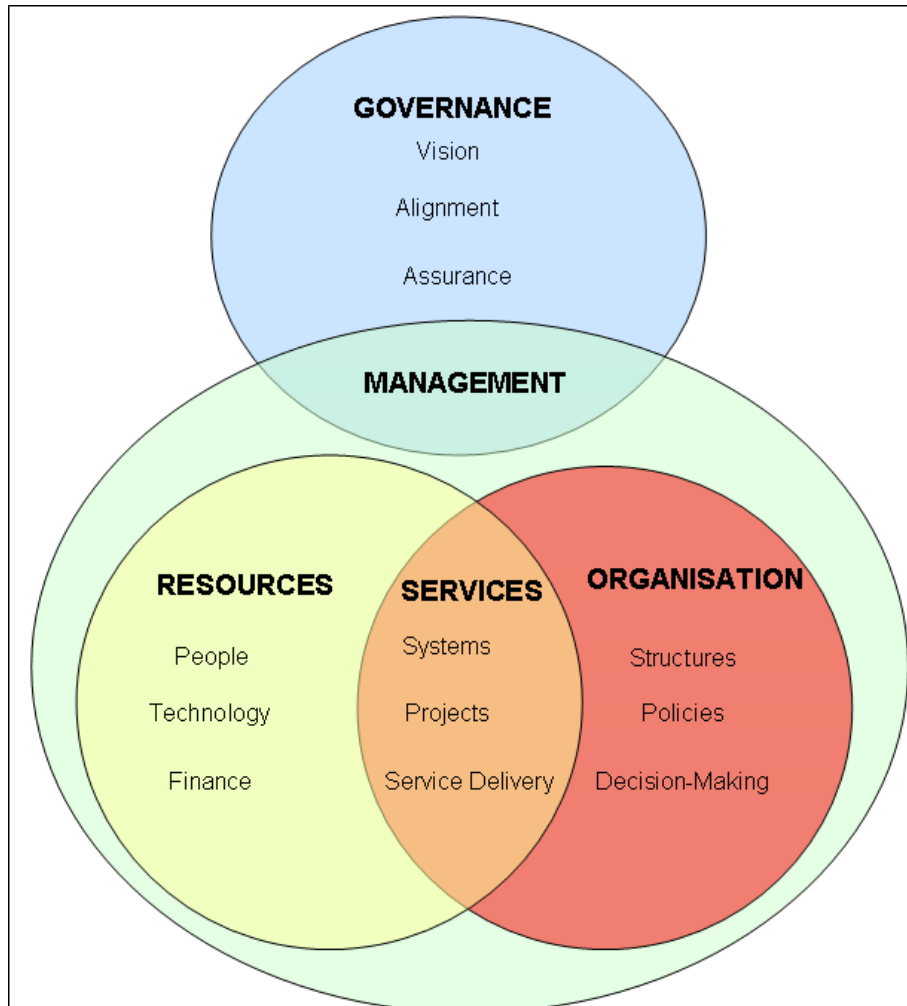


Figure 1 – A Framework for the Management and Governance of Information Systems

Each of the perspectives (governance, resources, organisation and services) contains three 'key issues'. The guidance contained in this toolkit is based on the proposition that the effectiveness of information systems governance and management can be ascertained and improved by reviewing these twelve key issues and identifying criteria by which performance in each can be compared over time or benchmarked against other institutions.

### ***Using This Toolkit***

This toolkit facilitates institutional self-assessment and was developed with the aim of helping institutions build their capability in the area of information systems management and governance whilst also increasing stakeholder confidence in the institution's information systems and their management and governance.

Feedback from the survey conducted as part of this project indicated that senior management required a toolkit that was practical and comprehensive, producing clear outputs without an

inordinately high overhead. Consequently this toolkit has been constructed to support self-assessment that can, over time, be built into the normal management processes of the institution.

Using the framework described above, this toolkit describes four steps through which institutions can review and improve their management and governance of information systems and IT:

1. **Preparation.** The process starts with a definition of the scope and remit of the exercise, an identification of the intended audience for the review and allocation of responsibility for conducting the review.
2. **Self-Assessment.** The second step is a self-assessment review of current information management and governance within the institution, aimed at helping institutions identify strengths and weaknesses.
3. **Planning Improvements.** The third step in the process is to plan improvements to address areas of weakness. The toolkit includes a number of resources - templates, checklists, case studies, best practice guidelines, standards and procedures – to assist in this process.
4. **Implementing Improvements.** The fourth step in the process is to implement the improvements through a prioritised programme of change.

## SECTION 1: PREPARATION

Prior to conducting a self-assessment the institution should define the context for the exercise and its outputs, by addressing the questions below.

### **Which information systems should be included in this exercise?**

*Information systems* can be defined as systems that involve the organised collection, processing and transmission of information. This definition includes both manual systems and those involving the use of IT.

While certain elements of information systems management will be applied to all information systems within an HEI (e.g. Data Protection legislation) other elements (e.g. providing senior management with reports about the system, conducting formal investment appraisals, etc.) will only apply to larger or more business-critical systems.

Consequently, prior to embarking on the self-assessment, the institution should identify those systems it considers significant. A number of criteria might indicate significance (e.g. cost, number of users, business criticality, risk, etc.) and a typical HEI might identify dozens of systems that it considers to be 'significant'.

### **What investments should be considered significant?**

At various stages of this process the institution is prompted to review its *significant investments* in information systems and IT. Prior to commencing the exercise the institution should decide what value it considers significant for a single investment.

### **Who will be responsible for co-ordinating the exercise?**

It is unlikely that all the aspects of the institutional self-assessment can be addressed by a single individual. Therefore the institution may wish to identify an individual who will be tasked with coordinating the institution's self-assessment and reporting on the results. It may be advantageous to have a senior manager other than the IS/IT manager coordinate this self-assessment to ensure an overarching evaluation.

### **Who will review the self-assessment?**

Given that the intention of the self-assessment is to highlight areas of strengths and weakness, the institution should identify who will be tasked with developing and implementing any necessary improvements to the institution's management and governance regime.

## SECTION 2: SELF-ASSESSMENT

This section contains a series of self-assessment questions designed to allow institutions to judge their strengths and weaknesses across a range of information systems and IT governance issues. The self-assessment questions are grouped using the Framework structure described above i.e.

- Governance – *vision, alignment, assurance*
- Resources – *people, technology, finance*
- Organisation – *structures, policies, decision-making*
- Services – *systems, projects, service delivery*

A separate self-assessment is conducted for each of the 12 *italicised* areas listed above. This self-assessment involves:

- A **key question** (highlighted in bold in the tables that follow)
- A number of subsidiary questions that will help inform the answer to the key question

The questions do not represent every aspect of information systems and IT management and governance. Rather, they have been chosen to represent the most significant or representative issues and to give an overall impression of the strengths and weaknesses of the institution's approach to information systems management and governance.

The questions have been designed to be generic – to add value within a variety of institutional contexts. Having a standard set of questions may assist institutions who wish to benchmark results with other institutions. However, that does not preclude institutions either adding additional questions that they feel are particularly relevant or ignoring those that they feel are not significant in their context.

In answering the questions the institutions should rate themselves on the 1-5 scale, with '1' denoting that the institution rates itself poorly in this regard and '5' indicating that the institution can answer positively for all the significant systems and services defined in the scope (see Section 1 above). In many instances, the institution may find that appropriate governance and management is only in place for some of their activities, or for some parts of the organisation. If this is the case the institution should assign a relative rating somewhere between 1 and 5. No prescriptive descriptions are offered in relation to these ratings, they are at the discretion of the institution, but they are designed to encourage reflection and improvement.

The 'Summary of Evidence' section underneath each question allows the institution to record the evidence or reasoning for the score they have allocated. The 'Indicators of Good Practice' contained in Section 3 of this document provide examples of documents and procedures that would demonstrate evidence of good practice in each area and thereby support a positive response. Ideally, the institution should be able to respond positively to all the key questions and by implication all the subsidiary questions.

Section 3 also contains additional resources and exemplars which might help inform any planned enhancements to an institution's management and governance resulting from the self-assessment.

## **Governance – Vision**

### **Has the institution defined its strategy for information systems and IT?**

1. Does the institution have a documented information strategy (or equivalent)? Summary of evidence:	1 2 3 4 5
2. Does the institution have a documented IT strategy (or equivalent)? Summary of evidence:	1 2 3 4 5
3. Have these strategies been approved by the <i>senior executive group</i> and (in the case of the information strategy) the <i>institutional governing body</i> ? Summary of evidence:	1 2 3 4 5
4. Are these strategies updated periodically? Summary of evidence:	1 2 3 4 5
5. Are these strategies linked to each other and to other relevant strategies (e.g. the institutional strategy, the teaching and learning strategy, the library strategy, etc.)? Summary of evidence:	1 2 3 4 5
6. Are all the institution's information systems (as defined in scoping exercise in Section1) covered by the information and IT strategies? Summary of evidence:	1 2 3 4 5

## **Governance – Alignment**

### **Are the institution's information systems and IT aligned to its strategy?**

1. Has responsibility for overseeing the implementation of the Information Strategy been assigned to an <i>Information Strategy Steering Committee</i> ?	1 2 3 4 5
Summary of evidence:	
2. Does the <i>Information Strategy Steering Committee</i> represent all relevant stakeholders in IT and information systems?	1 2 3 4 5
Summary of evidence:	
3. Does the <i>Information Strategy Steering Committee</i> approve all significant institutional investments in IT and information systems (whether centrally supported or devolved)?	1 2 3 4 5
Summary of evidence:	
4. Is the Information Strategy actively used by the <i>Information Strategy Steering Committee</i> to inform their decisions?	1 2 3 4 5
Summary of evidence:	
5. Is the <i>Information Strategy Steering Committee</i> provided with periodic reports on the services and projects under its remit?	1 2 3 4 5
Summary of evidence:	

## Governance - Assurance

**Does the institution provide assurance to its governors that its information systems are aligned to strategy?**

<p>1. Does the <i>senior executive group</i> receive periodic progress reports on the implementation of the <i>Information Strategy</i>?</p> <p>Summary of evidence:</p>	<p>1 2 3 4 5</p>
<p>2. Does the <i>institutional governing body</i> receive periodic progress reports (either directly or through a member) on the implementation of the <i>Information Strategy</i>?</p> <p>Summary of evidence:</p>	<p>1 2 3 4 5</p>
<p>3. Does the institution conduct a systematic review of the risks associated with information systems and IT (including the risk of underinvestment)?</p> <p>Summary of evidence:</p>	<p>1 2 3 4 5</p>
<p>4. Are the information systems/IT departments subject to periodic internal review (e.g. internal audit, peer review by other staff, management review, etc.)?</p> <p>Summary of evidence:</p>	<p>1 2 3 4 5</p>
<p>5. Are the information systems/IT departments subject to periodic external review (e.g. external audit, review by staff from other institutions, etc.)?</p> <p>Summary of evidence:</p>	<p>1 2 3 4 5</p>

## ***Resources – People***

**Does the institution have the right people and skills to make effective use of its information systems?**

1. Has the institution reviewed the number of staff that will be required to progress its Information Strategy (or equivalent) in the proposed timescale?	1 2 3 4 5
Summary of evidence:	
2. Has the institution identified where its Information Strategy is reliant on key individuals and taken appropriate risk management measures?	1 2 3 4 5
Summary of evidence:	
3. Are staff, throughout the institution, appropriately skilled and trained to make effective use of the information systems as required?	1 2 3 4 5
Summary of evidence:	
4. Are students throughout the institution appropriately skilled and trained to make effective use of the information systems as required?	1 2 3 4 5
Summary of evidence:	

## **Resources – Technology**

### **Is the institution's Information Technology aligned to its Information Strategy?**

1. Is the capacity of the institution's IT infrastructure adequate to meet the current requirements of the institution?	1 2 3 4 5
Summary of evidence:	
2. Is the capacity of the institution's IT infrastructure adequate to meet the future requirements of the institution?	1 2 3 4 5
Summary of evidence:	
3. Is the institution's IT and information secure?	1 2 3 4 5
Summary of evidence:	
4. Does the institution have a long-term IT replacement plan which reflects its institutional and information strategies?	1 2 3 4 5
Summary of evidence:	
5. Is the IT replacement plan updated regularly (e.g. annually) to reflect advances in technology?	1 2 3 4 5
Summary of evidence:	
6. Does the institution have processes in place which allow it to evaluate emergent technologies and plan for their deployment if appropriate?	1 2 3 4 5
Summary of evidence:	

## **Resources - Finance**

**Is the institution achieving value for money from its investments in IT and information systems?**

1. Can the institution identify how much it spends on its information systems?	1 2 3 4 5
Summary of evidence:	
2. Are budget allocations aligned with the implementing the Information Strategy?	1 2 3 4 5
Summary of evidence:	
3. Is performance against budget (both for central and devolved information systems spend) reported back to the <i>senior executive group</i> ?	1 2 3 4 5
Summary of evidence:	
4. Does the institution optimise its purchasing through best practice (e.g. tendering, purchasing consortia, negotiated discounts, etc)?	1 2 3 4 5
Summary of evidence:	
5. Are investments subject to retrospective review by the <i>Information Strategy Steering Committee</i> ?	1 2 3 4 5
Summary of evidence:	

## **Organisation – Structure**

**Is the information systems support structure aligned with the Information Strategy and IT Strategy?**

1. Does the institution periodically review which information systems and elements of IT should be under centralised or devolved control?	1 2 3 4 5
Summary of evidence:	
2. Does this review consider the costs, benefits and risks associated with each option?	1 2 3 4 5
Summary of evidence:	
3. Does the institution have a documented policy explaining the rights and responsibilities associated with devolved IT and information systems?	1 2 3 4 5
Summary of evidence:	
4. Does the institution periodically review and redefine the roles and responsibilities of the various departments and units involved in the support of information systems (e.g. libraries, IT departments, MIS departments, learning support units, etc.)?	1 2 3 4 5
Summary of evidence:	

## **Organisation - Policies**

**Does the institution have in place appropriate policies and procedures to manage its information systems?**

1. Does the institution have an acceptable use policy that all users are expected to sign and comply with?	1 2 3 4 5
Summary of evidence:	
2. Does the institution have an information security policy?	1 2 3 4 5
Summary of evidence:	
3. Are staff aware of their legal responsibilities in relation to information systems (e.g. Data Protection Act, Freedom of Information Act, Disability legislation, etc.)?	1 2 3 4 5
Summary of evidence:	
4. Does the institution monitor compliance with relevant legislation and policies across the institution?	1 2 3 4 5
Summary of evidence:	
5. Does the institution have a robust business continuity /disaster recover plan in place covering all its business critical information systems?	1 2 3 4 5
Summary of evidence:	
6. Is the disaster recovery/business continuity plan regularly tested?	1 2 3 4 5
Summary of evidence:	

## **Organisation – Decision-Making**

**Does the Institution make informed and effective decisions in relation to information systems and IT?**

1. Does the <i>Information Strategy Steering Committee</i> contain sufficient expertise to guide the development and implementation of the Information and IT Strategies?	1 2 3 4 5
Summary of evidence:	
2. Are business cases/project proposals developed for each significant investment?	1 2 3 4 5
Summary of evidence:	
3. Does the institution evaluate proposals/options in relation to their potential benefits, costs and risks?	1 2 3 4 5
Summary of evidence:	
4. Does the institution routinely identify obsolete services and systems to be discontinued?	1 2 3 4 5
Summary of evidence:	

## **Services - Systems**

### **Does systems architecture support the institutional strategy?**

1. Does the institution take a structured approach to planning its systems?	1 2 3 4 5
Summary of evidence:	
2. Are key corporate systems integrated?	1 2 3 4 5
Summary of evidence:	
3. Is there cohesive access (e.g. single point of authentication) to key corporate systems?	1 2 3 4 5
Summary of evidence:	
4. Is the infrastructure and systems architecture adequately documented?	1 2 3 4 5
Summary of evidence:	
5. Is the systems infrastructure sufficiently flexible to adapt to future requirements?	1 2 3 4 5
Summary of evidence:	
6. Does the institution consider all potentially appropriate solutions (e.g. proprietary, in-house development, open-source, outsourcing, collaboration, etc.) prior to investing in an information system?	1 2 3 4 5
Summary of evidence:	

## **Systems – Projects**

### **Do projects achieved their planned objectives?**

1. Does the <i>Information Strategy Steering Committee</i> receive reports on the outcomes of all significant <i>development projects</i> and <i>pilot projects</i> ?	1 2 3 4 5
Summary of evidence:	
2. Are significant <i>implementation projects</i> managed using structured project management methodologies?	1 2 3 4 5
Summary of evidence:	
3. Does the <i>Information Strategy Steering Committee</i> receive periodic reports on all significant <i>implementation projects</i> ?	1 2 3 4 5
Summary of evidence:	

## **Systems – Service Delivery**

**Do services meet users' requirements and/or expectations?**

1. Does the institution routinely canvas the requirements of <i>users (e.g. staff and students)</i> ?	1 2 3 4 5
Summary of evidence:	
2. Does the institution actively manage expectations (e.g. through <i>service definition statements, service level agreements, etc.</i> )?	1 2 3 4 5
Summary of evidence:	
3. Are service levels monitored?	1 2 3 4 5
Summary of evidence:	
4. Does the institution obtain feedback on user satisfaction for <u>all</u> its services?	1 2 3 4 5
Summary of evidence:	

## SECTION 3: PLANNING IMPROVEMENTS

### *Introduction*

This section of the toolkit details a number of resources such as templates, checklists, case studies, best practice guidelines, standards and procedures that institutions may want to consider to strengthen their management and governance of information systems and IT.

Each topic includes some 'Indicators of Good Practice' - those documents or procedures that would provide evidence of good practice in that particular area.

### *Governance: Vision*

The first key governance issue relates to the development of an Information Strategy and an IT Strategy to support the institution's vision and institutional strategy.

#### **Indicators of Good Practice**

The following could be considered indicators of good practice in the area of information and IT strategies:

- Existence of an Information Strategy and an IT Strategy.
- History of regular review and update to strategies.
- Specific cross references to other strategies within the Information/IT remit.
- Scope of information and IT strategies covering all significant information systems.

As information systems and IT become increasingly ubiquitous in all aspects of HE activity (teaching and learning, research, administration, etc.) it is necessary to take a coordinated, institution-wide approach not only to the acquisition of IT but also to the current and future information requirements of the institution and how these can be best supported. This focus on information rather than technology will become even more important in the future if, as many commentators predict, IT can increasingly be treated like a commodity or utility.

In the survey of over 100 UK HEIs conducted as part of this project, institutions were asked about their attitude to Information and IT strategies. The table below summarises their responses:

<b>Response</b>	<b>Information Strategy (%)</b>	<b>IT Strategy (%)</b>
Actively Used	25	46
Used, but not applied consistently	23	18
Developed but not actively used	17	10
Under Development	25	18
Not Required/ Not Relevant/ Don't Know	10	8

From this survey it can be seen that IT strategies tend to be more actively used in institutions than information strategies, perhaps reflecting the fact that the concept of institution-wide planning of information, and the attendant need for strategies, still has some way to go before it can be considered fully understood and embedded. However over 30% of institutions either do not have an IT strategy or do not use it actively. Where information and IT strategies are not in place to coordinate and inform activities there is a significantly higher risk that the institution will not be:

- aligning its information systems activities with institutional goals
- achieving value for money from its investments
- managing its information resources effectively
- managing the risk associated with failures in its information systems.

To address these risks institutions should:

- Develop an Information Strategy and have it approved by the *Senior Executive Group*
- Link the Information Strategy to the Institutional Strategy and ensure that the Information Strategy supports the institutional objectives.
- Ensure that the Information Strategy is reviewed and updated periodically.
- Develop an IT Strategy which supports the Information Strategy.
- Seek approval for the IT Strategy from the *Information Strategy Steering Committee*
- Ensure that the IT Strategy is reviewed and updated periodically (e.g. annually).
- Ensure that the Information Strategy and IT Strategy are linked, through the development and approval process, to other relevant strategies (e.g. the Teaching and Learning Strategy, the e-Learning Strategy, the Estates Strategy, etc.)

Institutions should also ensure that their strategies, once in place, are comprehensive. It is not uncommon for information and IT strategies to reflect only certain aspects of the institution's information systems. Consequently, it may be worthwhile to identify the major information systems within the institution and to review the information strategy to ascertain whether each of the information systems is covered within the strategies' scope.

## **Governance: Alignment**

The purpose of information systems and IT governance is to ensure that information systems activity within an HEI is aligned to the strategy. This alignment will be achieved by ensuring that responsibility for implementation of the strategy is clearly delegated by the governors; that all major activity is approved in the context of the strategy and that progress on implementing the strategy is reported back to the governing body.

The cornerstone of this governance structure is the formation of a committee overseeing the Information Strategy and the activities that are governed by it. The survey conducted as part of this project indicates that, unsurprisingly, this type of committee exists under a number of different names within institutions. For the purposes of this document this committee is referred to as the *Information Strategy Steering Committee*.

This group should represent all relevant stakeholders in the institution's information and IT. This should normally include:

- Senior management
- academic and administrative staff representatives, reflecting the diversity of skill levels from across the institution from expert users to those who, as yet, have had little involvement in IS and IT
- student representative
- lay member(s) of the Institutional Governing Body with experience in information systems or information strategy.

The scope and remit of the committee should be carefully considered to ensure that all significant investments in IT and information systems across the institution are presented to this committee for approval in the context of the institution's information and IT strategies.

As well as approving investments in IT and information the remit of the committee may include

- Allocation and approval of IT and information systems budgets.
- Prioritisation of investments.
- Long-term investment planning.

### **Indicators of Good Practice**

The following indicate that the institution follows good practice in relation to aligning activity to strategy:

- Establishment of an *Information Strategy Steering Committee* tasked with implementing the Information and IT strategies.
- Representation of all significant stakeholders on the *Information Strategy Steering Committee*.
- All significant IT and information systems investment approved by the *Information Strategy Steering Committee*.

- Approval of service levels.
- Progress and completion reports on projects and investments.
- Periodic reports from major service areas.

A member of the *Senior Executive Group* of the institution should sit on the *Information Strategy Steering Committee* to ensure that the former group is fully briefed on the work of the latter.

## **Governance: Assurance**

In addition to ensuring that its information and IT activities are aligned to strategy the institution should consider the means by which it assures its governors and other stakeholders that this is the case.

### **Indicators of Good Practice**

The following could be considered indicators of good practice in the area of assurance to governors

- Periodic reports on implementation of the strategy from the *Information Strategy Steering Committee* to the *Senior Executive Group* and the *Institutional Governing Body*.
- Inclusion, within these reports, of an assessment of value for money achieved from investments.
- Feedback from Governors regarding their views of the alignment of the work of the *Information Systems Steering Committee* with the Information Strategy.

Possible strategies for assurance include

- Periodic reports on implementation of the strategy from the *Information Strategy Steering Committee* to the *Senior Executive Group* and the *Institutional Governing Body*.
- Review of management structures, policies, procedures and investments related to IT and information systems by the institution's internal audit function. If the Internal Audit function does not possess suitable skills the function could be contracted out to consultants.
- External review of the management of information and information systems by external bodies (e.g. external auditors, peer review by other institutions, etc.)
- Involvement of IT and information staff in sector support bodies (e.g. JISC, UCISA, SCONUL, etc.)

## Resources: People

The successful management and governance of any organisation is dependent upon having the right people with the right skills and expertise in the right positions. This is particularly true for HE institutions where the discovery and transmission of knowledge is the organisation's purpose and where much of that knowledge is tacit and undocumented.

### Indicators of Good Practice

From a governance perspective the following documents and policies would point to an effective approach to people management within the area of information systems and IT:

- Regular 'Training Needs Analysis' exercises are conducted for staff and students.
- Regular skills training programmes are run to address the requirements raised in the training needs analysis.
- The institution provides formal validation/certification of student IT skills
- The institution adopts good practice for people management, as described in the HEFCE toolkit (URL: <http://www.hefce.ac.uk/lgm/hr/selfassess/> ). This provides guidance on a range of HR issues including strategies for effective funding, recruitment and retention of staff.
- The institution has 'Investors In People' accreditation. (URL: <http://www.investorsinpeople.co.uk/IIP/Web/default.htm> )

In relation to the management and governance of information systems the institution must satisfy itself that:

- There are sufficient staff numbers to support and progress the institution's information and IT strategies.
- The staff have the requisite skills to maintain and process the strategies.
- The staff are adequately recompensed. In relation to remuneration, UCISA has conducted a staff survey (most recently in 2004) which can provide information on staff salaries and turnover rates as a benchmark for institutions. (URL: <http://www.ucisa.ac.uk/activities/surveys/salary/> )

The institution must also ensure that there is alignment between its information systems and the skills and capacity of the staff, students and other stakeholders who use the systems. This alignment can be maintained by conducting a periodic Training Needs Analysis and then addressing identified skills deficits by formal staff development and student training programs. Many institutions now ensure that all graduates have a minimum level of competency in IT either by embedding assessment within the academic curriculum or by verifying competence through a general 'IT Skills' test.

## Resources: Technology

### Key Indicators of Good Practice

The following documents and policies would provide evidence of good practice in the area of information technology:

- A comprehensive IT Strategy that is aligned to the information strategy and updated regularly.
- Translation of the plan into an approved, long-term budget for the acquisition and replacement of major elements of the IT infrastructure.
- A Capacity Plan (either as a separate document or as part of the IT Strategy) showing estimated/planned usage and how the infrastructure will deal with this.
- A current Disaster Recovery/Business Continuity Plan and evidence that this is tested regularly in whole or in part (e.g. failover testing)
- A Security Policy and evidence that it is tested regularly perhaps by an independent body.
- An Acceptable Use Policy which all system users (staff, students and others) have signed
- Reports on security breaches to the *Information Strategy Steering Committee*.
- Reports on unplanned disruptions to the *Information Strategy Steering Committee*.

Clearly the management of the institution's information technology will be a key component of an effective approach to the management and governance of information systems. From a governance perspective the institution will want to ensure that the infrastructure is of sufficient capacity and quality to support the Information Strategy and that the institution's IT and the information contained therein is secure. To assist institutions in planning system security UCISA have produced an Information Security Toolkit, which can be found at URL: <http://www.ucisa.ac.uk/ist/>. It is worth noting that several respondents to the survey, conducted as part of this project, indicated that they employed external companies to assess the robustness of their security policies.

## **Resources: Finance**

### **Indicators of Good Practice**

The following indicators would point to good practice in relation to the financing of information systems:

- Guidelines on purchasing IT and software which are applied consistently across the institution.
- Use of tendering for significant purchases.
- Membership of purchasing consortia
- Summary annual reports on expenditure on all information systems and IT systems across the institution.
- Translation of the information strategy into costed implementation plans.
- Use of Cost/Benefit Analysis and Option Appraisal techniques to inform decisions on major investments.

The issues surrounding the financing of information systems and evaluating the value for money obtained from investment can appear intractable. Within HE, spending on IT has grown disproportionately in the last 15-20 years but it is often difficult to draw a direct relationship between investment and outcomes, as most IT spend is embedded within other processes. Nevertheless, institutions will want assurance that their investment in IT is efficient and effective.

The first key component of this assurance will be the budgeting and allocation process. The institution should identify the cost of implementing its Information Strategy and ensure that appropriate funding is allocated to those tasked with implementing the strategy. While this is a straightforward concept, in practice several factors militate against the alignment of budget and strategy:

- Many institutions have devolved responsibility to academic units for certain elements of IT expenditure, making it difficult to identify total spend across the institution and making the implementation of the strategy more complex. The advantages of devolved responsibility may come at the price of less efficient investment unless the devolved responsibility is governed by a framework (e.g. procurement regulations, purchasing agreements with favoured suppliers, etc.)
- Strategies are, by definition, medium to long term vision documents and should not be 'static' documents. Consequently identifying the 'cost' of the strategy with any degree of accuracy may only be possible as components of the strategy are translated into implementation plans and service definitions. This emphasises the need to ensure that the strategy is updated regularly and informed by detailed financial estimates as they are developed.
- The long-term nature of a strategy is at odds with the short-term (i.e. annual) budgeting regimes employed by most HEIs. To resolve this discrepancy institutions must either develop longer-term funding streams (particularly in relation to major capital investments) or accept that the timescales within which the strategy is implemented may vary depending on the availability of funds from year to year.

At an operational level the institution can ensure that the funding is spent *efficiently* (i.e. that the *total cost of ownership* is kept as low as possible) by managing the procurement process.

Whether or not the institution has dedicated purchasing staff, the management of procurement should include some or all of the following:

- involvement in relevant purchasing consortia
- adoption of best practice (such as that detailed by the PROC-HE purchasing body URL: <http://www.proc-he.ac.uk/>)
- Relationships with favoured suppliers, translating into favourable purchasing agreements.
- Policies covering the procurement of IT within the institution.

The *effectiveness* of IT investment is rather more difficult to ascertain than its *efficiency*. Managers and governors will wish to ascertain whether an investment in information and/or IT has produced the optimal value for money. To ascertain this, the institution must investigate:

- The potential options for investment
- The cost of each option
- The benefit to be accrued from each option.
- The risk associated with each.

The institution should then draw a comparison of the benefits, costs and risks of each option.

JISC has funded the development of guidance covering a number of these issues.

- A Guide to Investing in Software and Services (URL: [http://www.strath.ac.uk/learningservices/innovation/innov\\_projects/projectarchives/](http://www.strath.ac.uk/learningservices/innovation/innov_projects/projectarchives/)) contains guidance for senior managers on identifying potential solutions and the types of issues that should be considered when appraising options.
- The Insight Framework for the Cost/Benefit Analysis of E-learning (URL: [http://www.strath.ac.uk/learningservices/innovation/innov\\_projects/projectarchives/](http://www.strath.ac.uk/learningservices/innovation/innov_projects/projectarchives/)) describes a framework for conducting evaluations of the relative costs and benefits of competing options or pilots. This includes techniques to address the issue of comparing quantitative and qualitative information.
- JISC Infonet has developed an Infokit which describes a detailed approach to managing risk in relation to information systems and IT. This can be found at URL: <http://www.jiscinfonet.ac.uk/InfoKits/risk-management/index.html>.

## **Organisation: Structure**

Organisations adopt a variety of structures to support their information and IT activities. While there is no 'correct' structure, whatever structure is adopted must be appropriate to support the strategy, physical environment and culture of the institution and will often also reflect the expertise and interests of key personnel.

That said, it is informative to consider trends in the organisation of information systems management within HE. Over 90% of institutional IT Directors now also manage the institution's MIS function.

### **Indicators of Good Practice**

The following documents and processes would indicate that an institution has taken a considered approach to defining the structures that support IT and information systems:

- Documented policy detailing the rights and responsibilities relating to devolved IT and information systems (e.g. purchasing guidelines, guidelines related to attaching equipment to the network, regulations on physical and digital security, etc.)
- Periodic reviews of services and systems which consider the mix of centralised and devolved responsibilities.
- Periodic reviews of the support structures of information systems and technologies to ensure their continued appropriateness.

Increasingly a number of institutions are also consolidating audio-visual and media services, libraries and telecommunications (or some combination thereof) under a single directorship, creating positions analogous to the 'CIO' (Chief Information Officer) in large commercial organisations.

The survey conducted as part of this project showed that the degree to which responsibility for information systems is devolved to academic departments will vary, depending on the type of

system and the culture of the institution. The table below details the survey responses and illustrates that while certain functions are centrally maintained in most institutions (e.g. adding components such as new servers to the institution's network infrastructure) other functions (e.g. implementing subject-specific software) are more commonly devolved.

	<b>Responsibility:</b>	Central Support Function	Mix of Central/ Devolved	Devolved to Depts	Outsourced	Unknown
<b>Function:</b>						
Acquiring materials for institutional library		84%	6%	5%	1%	4%
Adding Network Components		79%	19%	2%	0%	0%
Maintaining Admin PCs		79%	13%	5%	3%	0%
Maintaining Access Rights		75%	20%	5%	0%	0%
Maintaining VLE for students		66%	18%	5%	3%	8%
Maintaining Student Computing Facilities		50%	35%	10%	0%	5%
Maintaining Academic PCs		48%	34%	15%	2%	1%
Maintaining Web Pages		34%	47%	18%	1%	0%
Implementing subject specific software		23%	36%	40%	1%	0%

29% of institutions responding to the survey indicated that they had a policy in place which detailed 'the rights and responsibilities associated with devolved IT provision (i.e. supported by academic units rather than a central IT unit', while another 22% were developing a policy.

As new information systems emerge and as IT becomes increasingly ubiquitous and embedded, the functions that are required to support information systems will evolve. The emergence of learning technologies and specialist staff to support these is a recent example of such an evolution.

These functions can then be translated into suitable structures, recognising institutional strengths and culture, the strengths of key individuals and the relative costs, benefits and risks associated with different options.

## **Organisation: Policies and Procedures**

Given the ubiquity of IT and information systems within HEI, *policies* and *procedures* are essential in order to manage the relationships between users, systems, support staff and management.

### **Policies**

There are a number of issues where it is important that the institution sets its policy and then ensures that all users have been informed of their rights and responsibilities in relation to that policy. These will include

- *Acceptable Use Policy*
- Information security policy
- Freedom of Information compliance
- Data Protection compliance
- Compliance with accessibility legislation

### **Indicators of Good Practice**

The following would serve as indicators of good practice in relation to policies and procedures

- Agreed policies in relation to IT use and relevant legislation
- Effective dissemination of policies
- Monitoring and reporting breaches of compliance with policies
- Robust testing of the Disaster Recovery Plan with results reported to the *Information Strategy Steering Committee*.

For each of the above policies, the institution should define a plan (to be revisited periodically) to ensure that the policy is put into practice. This may include some or all of the following steps:

- Developing, documenting and agreeing the policy
- Effectively disseminating that policy to all relevant individuals (e.g. staff and/or students). This may involve distribution of documents, maintaining websites, running training courses, etc.
- If appropriate, acknowledgment of the policy by the user (e.g. the signing of an acceptable use policy, attending a training course).
- Embedding the policy in other policies and procedures (e.g. acceptable use policy within student regulations and employment contracts).
- Monitoring of compliance of the policy, either by identifying all breaches or by sample checking.
- Reporting breaches of the policy.
- Taking appropriate actions (e.g. action against the transgressor, changes to the policy, etc.)

### **Procedures**

In addition to policies the institution should also have documented procedures covering its more critical information systems and IT components. The most important of these will be the Disaster Recovery / Business Continuity Plan and in particular the documents or sections relating to information systems and IT.

UCISA have developed a guide to business continuity planning, which can be found at ([URL http://www.ucisa.ac.uk/resources/bestpractice/Business-continuity-planning.pdf](http://www.ucisa.ac.uk/resources/bestpractice/Business-continuity-planning.pdf) ). JISC Infonet hosts a useful case study on City University's recovery from a fire in 2001. ([URL: http://www.jiscinfonet.ac.uk/Resources/external-resources/project-phoenix](http://www.jiscinfonet.ac.uk/Resources/external-resources/project-phoenix)).

The critical issues that senior managers and governors may wish to focus on are:

- Has the institution defined its approach to risk (i.e. what are the consequences of systems failure? What level of risk is acceptable? How much will the institution have to spend to reduce its exposure to risk?)
- Has a comprehensive Disaster Recovery/Business Continuity plan been developed?
- How frequently is the plan updated (e.g. is it updated each time there is a major addition to the infrastructure or change to an information system)?
- How frequently is the plan tested, in whole or in part?

### ***Organisation: Decision-Making***

In the context of this toolkit, 'decision-making' refers to strategic decision-making i.e. decisions of a magnitude that warrant consideration by the Institution's *Information Strategy Steering Committee*. At that level the effectiveness of decision-making is dependent upon ensuring that the correct individuals are empowered to make the decision and that they are presented with appropriate information in a clear and concise manner by the Business Unit and IT staff making the proposal.

92% of survey respondents indicated that 'major project proposals are subject to a structured review and approval process'. However, only 62% used 'a structured approach to the development and evaluation of business cases' and only 66% conducted post-implementation reviews of projects against their stated objectives. It would appear that many institutions have not yet 'squared the circle' and implemented routine evaluation of projects after the investment has been made.

### Setting the Agenda

In the first instance, the institution will want assurance that all relevant, potential solutions are being presented to the *Information Strategy Steering Committee*.

Assessing the completeness of the information being presented will be primarily dependent on the expertise of the *Information Strategy Steering Committee* - emphasising the need to have at least some members who have in-depth expertise in Information systems and IT and who have a governance rather than a managerial relationship to the institution's IT/IS departments.

#### Indicators of Good Practice

From a governance perspective, the existence of the following types of document would provide some assurance that effective decision-making was in place:

- A standard template being used for investment proposals presented to the *Information Strategy Steering Committee*.
- A standard methodology for costing applied consistently across all proposals
- A consideration of the risk associated with proposals (e.g. the risks of not investing, risks that might affect planned outcomes, etc.)
- A standard approach to evaluating the benefits of proposals in relation to their cost.
- Periodic reviews of on-going services.

Additionally, JISC have developed a 'Guide to Investing in Software and IT Services' (URL: [http://www.strath.ac.uk/learningservices/innovation/innov\\_projects/projectarchives/](http://www.strath.ac.uk/learningservices/innovation/innov_projects/projectarchives/)) which contains a summary of the types of issues that senior managers should consider when faced with evaluating a range of potential solutions.

### Templates for Proposals

As proposals for investment may originate from a variety of sources in the institution, the use of standard templates and guidelines can help insure that the all relevant information is included and that some degree of consistency is achieved.

JISC Infonet, as part of their Project Management Infokit, has produced a 'Business Case Assessment Form', which could be utilised as a template by institutions. This can be found at URL: <http://www.jiscinfonet.ac.uk/InfoKits/infokit-related-files/business-case-template>. JISC Infonet also developed an Infokit which describes a detailed approach to managing risk in relation to information systems and IT. This can be found at URL: <http://www.jiscinfonet.ac.uk/InfoKits/risk-management/index.html>.

### Evaluation

It is important that information system investments are not only evaluated on the basis of costs but also in relation to the benefit that can be derived. However comparing quantitative cost information with information on benefits (which may be subjective and/or qualitative) can be problematic. To address this problem JISC funded a framework for comparing the costs and benefits of ICT investments, which can be found at URL: [http://www.strath.ac.uk/learningservices/innovation/innov\\_projects/projectarchives/](http://www.strath.ac.uk/learningservices/innovation/innov_projects/projectarchives/). This framework was developed to deal with e-learning investments but can be applied to any form of ICT investment.

## Services: Systems

The institution should ensure that it is taking a structured and considered approach to its *systems architecture* to ensure that a co-ordinated set of services can be offered to users now and in the future, while achieving value for money from the institution's investment.

### Indicators of Good Practice

Systems architecture is a complex and technical area, however the following can be viewed as significant indicators of good practice by senior management and governors:

- Inclusion of information about the approach to systems architecture within the IT Strategy
- Documentation of the systems architecture using design tools such as business process models, technology architecture models, data models, etc.
- Consideration of a range of software and service solutions (e.g. proprietary products, in-house developments, open-source solutions, out-sourcing) within the funding proposals/business cases submitted to the *Information Strategy Steering Committee*.
- Inclusion of 'exit strategies' as part of any significant investment proposal submitted to the *Information Strategy Steering Committee* for approval.

One of the key management challenges will be to ensure that the appropriate balance is struck between the need to integrate systems across the institution and the need to ensure that there is sufficient flexibility in the system architecture to meet changing, long-term requirements.

The integration of information systems can offer a number of benefits, both to users (e.g. fewer passwords, more consistent look and feel) and to the institution (e.g. more consistent data, more efficient processing through single sourcing of data). Likewise, taking an integrated approach to the acquisition and maintenance of the institution's infrastructure can yield considerable benefit (e.g. fewer compatibility problems, potential cost reductions by buying more from smaller number of suppliers, etc.)

However, these benefits may have costs associated with them:

- Tie-in to particular products, technologies or suppliers, making it difficult or expensive to change.
- Inflexibility, making it difficult to replace single elements of infrastructure or single systems without affecting or changing other elements.
- Foregoing a 'best of breed approach' (i.e. buying the best of system to address each of the institution's requirements) and, instead, acquiring all products from a single supplier, regardless of whether they are the best solution or not.

Potentially, there is a new solution to this 'integration vs. flexibility' issue – interoperability standards. These standards specify structures and formats that allow data to be shared between systems. A great deal of effort is currently being expended in the definition of these standards. However, it will be some time before it becomes clear whether or not these standards will be widely adopted. Consequently, in the short-term most institutions will continue to rely on traditional means of systems integration – buying technologies that are 'compatible' and developing systems that either interface (i.e. transfer data) or integrate (i.e. share data) with each other.

Clearly governors and senior institutional managers will be reliant on senior IT managers to develop appropriate systems architecture. However, it is important that in approving the development of the institution's architecture, senior managers are aware of the pros and cons associated with each potential course of action. The JISC-funded 'Guide to Investing in IT Systems and Services' which can be found at URL: [http://www.strath.ac.uk/learningservices/innovation/innov\\_projects/projectarchives/](http://www.strath.ac.uk/learningservices/innovation/innov_projects/projectarchives/) reduces the complex issues surrounding the acquisition of new information systems and services to nine main criteria, which can inform the dialogue between IT specialists and senior management and governors:

1. Functionality

2. Robustness and reliability
3. Licences, Contracts and IPR
4. Integration
5. Future direction (including product upgrade and development)
6. Internal support
7. External support
8. Exit strategy
9. Cost

## Services: Projects

In considering the appropriate management of information systems projects institutions may find it useful to categorise projects in the following way:

- A *development project*. A project involving non-academic research or development with the objective of investigating a new technology or approach, or conducting research to inform the planning of a pilot or implementation project. Typically this type of project will result in the acquisition of knowledge rather than the development of services.
- A *pilot project*. A project, usually small-scale, to explore the potential costs, benefits and risks associated with new technologies or systems. The objective of these projects is usually to inform a decision about a larger implementation through production of a prototype and/or a small scale implementation.
- An *implementation project*. A full-scale implementation with significant resources attached, clearly defined objectives and an agreed timescale. This type of project lends itself to formal project management techniques.

### Implementation Projects

61% of institutions who responded to the survey indicated that they took a structured approach to the implementation of new project, while another 23% indicated that they were developing a structured approach.

There are many frameworks which can be applied to *implementation projects*. The de facto standard for project management in the UK is PRINCE2, developed by the Office of Government Commerce.

Of the survey respondents 84 % indicated that they used PRINCE2 regularly or occasionally for project management. 11% responded that they were unsure if the tool was used, while only 5% indicated that they had decided that PRINCE2 was inappropriate and/or too costly to implement.

PRINCE2 is very comprehensive framework and the overhead of applying the technique to small to medium sized projects can seem large. To address this JISC Infonet have produced an Infokit on 'Project Management' which 'pares down' PRINCE2 to the bare bones of a framework suitable for managing any project'. This Infokit can be found at URL:

<http://www.jiscinfonet.ac.uk/InfoKits/project-management>

### Indicators of Good Practice

The following represent some indicators of good practice in relation to project management:

- A documented policy defining project types and how each should be controlled (e.g. for projects over a certain value formal project management techniques should be deployed, etc.).
- The use of formal project management techniques where the size of the project warrants it.
- Reporting and dissemination of the results of *pilot and development projects*.

## Development and Pilot Projects

The case for applying formal project management techniques to smaller scale *development* and *pilot projects* is less persuasive, particularly if these projects are experimental in nature and/or if they are being conducted by academic staff on an 'ad hoc' basis. Nevertheless if institutions are to benefit from the investment of time and resources, certain 'minimum' level good practice should be applied:

1. The objectives of the project should be clear (even if these are only 'To investigate.....')
2. Any outputs should be compatible with the institution's technical and information strategies, thereby allowing outputs to be 'scaled-up' or findings to be applied to the wider institution.
3. The outcomes of the project should be appropriately reported and disseminated. If the 'lessons learned' (whether the project has been successful or not) are not reported and disseminated in a 'blame-free' environment then the institution will not benefit.

## Services: Service Delivery

In theory all investment in information and IT within an institution should be directed towards the delivery of services to the staff and students within the institution and to other stakeholders (e.g. potential students, partners in collaborations, funding bodies, etc.). Consequently it is clearly important to ensure that the user's perspective is incorporated into the management and governance processes.

### Indicators of Good Practice

An institution may decide to adopt a formal framework (such as ITIL) to manage its information systems and IT service delivery. Each formal framework specifies a number of outputs and performance indicators. Even if an institution does not adopt one of these frameworks a number of documents would provide assurance of good management of on-going services:

- Periodic analysis of the requirements of users (both in general terms and in relation to specific services).
- Service Definition Statements indicating when services are available, when they are supported, etc. Institutions may decide to govern some of their services through more formal Service Level Agreements.
- The appropriate committee (e.g. *Information Strategy Steering Committee*) should receive periodic comparisons between stated service levels and actual service delivery, including reports on significant unplanned disruptions.
- Periodic user satisfaction surveys should also be conducted, with the results reported back to the relevant committee.

### Service Management Frameworks

Service Delivery is the area of information systems activity best supported by management frameworks. One of the most common is the ITIL (IT Infrastructure Library) Framework. ITIL was developed by the UK's Office of Government Commerce as a framework for IT Service Management, incorporating best practice from the public and private sectors and linked to the British Standards Institution's standard for IT service Management (BS15000).

The ITIL framework contains detailed guidance in a number of areas: Service Delivery, Service Support, Planning, Security Management, ICT Infrastructure Management, Application Management, Software Asset Management, etc.

In the survey conducted as part of this project 16% of institutions indicated that they used ITIL 'regularly' while 29% used it 'occasionally'. 16% indicated that it was not relevant to their requirements or that the cost of implementation was too high, while 40% were not aware of the tool or were unaware if it was being used.

More information about ITIL can be found at URL: <http://www.ogc.gov.uk/index.asp?id=2261>. The British Standards Institute's BS15000 kite mark is explained in detail at URL: <http://www.bs15000.org.uk/index.htm>

### **Requirements, Expectations and Delivery**

The key to any successful approach to service management is matching the requirements of the users with delivered services, within the constraints of available resources. Given that resources are not unlimited it is important that institutions prioritise user requirements and that the user's expectations are managed, primarily by communicating to them the levels of service that they can expect. *Service Definition Statements* (a statement of service availability) and *Service Level Agreements* (a formal agreement between service provider and service recipient) can be useful tools in managing users' expectations.

68% of survey respondents indicated that they defined and monitored service levels within their institution, while performance against service levels was reported to senior management in 50% of responding institutions.

## SECTION 4: IMPLEMENTING IMPROVEMENTS

Following the self-assessment institutions may find that they wish to implement changes to the way in which information systems are managed and governed within their institution. Taken as a whole this may constitute a large programme of work containing a number of sub-projects.

Consequently, institutions will recognise that the enhanced management and governance processes (and the initial implementation of these) may require additional resourcing. However research shows that this type of investment should pay for itself in the long run often reducing overall cost while increasing the value that the institution derives from its information systems investments.

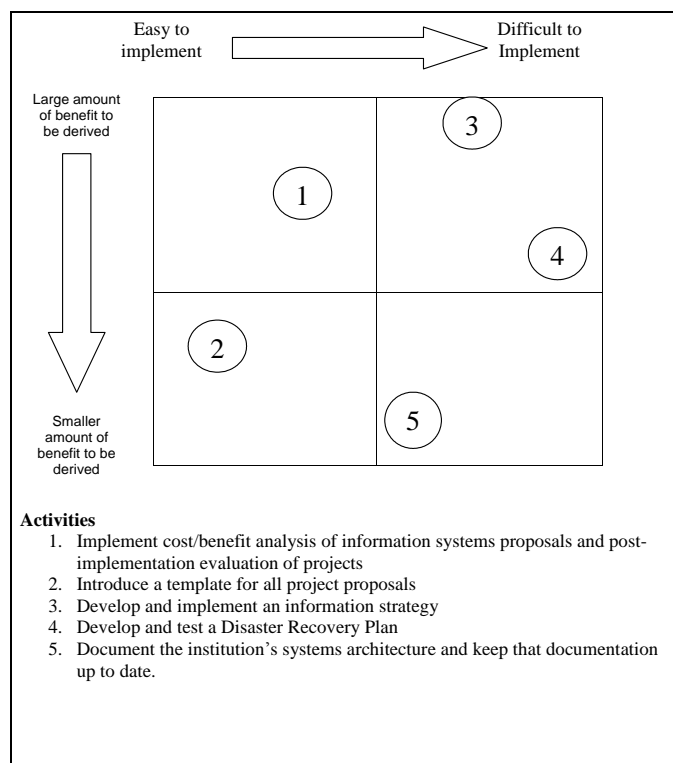
### Prioritisation

To manage the implementation of this programme of work, and to help 'sell' the concept throughout the institution, it may be necessary to prioritise the implementation of these changes. A useful approach is to start the programme with projects where the relatively large benefit can be delivered at relatively low cost – 'start with the low hanging fruit'.

Having identified, through self-assessment, those areas of management and governance that the institution wishes to strengthen through the implementation of new policies and procedures the institution should then identify:

- The cost or degree of difficulty associated with the implementation of each.
- The relative benefit to be derived from each

It may be useful to map the outcomes of this exercise in a matrix diagram like the one shown below. The institution would then start to implement its programme of change starting with the activities nearest the top-left corner of the diagram.



## APPENDIX A: GLOSSARY

The following terms are used in this document. While some (like 'Failover') are generally recognised technical terms, others (like 'Information Strategy Steering Committee') are terms specifically defined in the context of this document to describe groups, roles or processes that may be known under a variety of names in different institutions.

Acceptable Use Policy (AUP)	A policy defining the way in which an institution's network may be used. The JANET network as a whole also has an acceptable use policy. Often these policies require a signature from a new member of staff or student before access to the network is granted.
Development Project	A project involving non-academic research or development with the objective of investigating a new technology or approach, or conducting research to inform the planning of a pilot or implementation project. Typically these would result in the acquisition of knowledge rather than the development of services.
Effectiveness	Producing the optimal result.
Efficiency	Producing a result with the minimal required resources.
Failover	The ability to switch automatically to standby networks, servers or systems without the need for human intervention. This is often built into critical systems to ensure business continuity in the event of a failure.
Information Strategy Steering Committee	The internal group or committee assigned responsibility for overseeing the implementation of the institution's information strategy.
Information System	A system that involves the organised collection, processing and transmission of information.
Information Workers	Institutional staff whose primary role is to support the institution's information systems including IT staff, library staff, etc.
Interoperability	Interoperability standards specify structures and formats that allow data to be shared between systems.
Implementation Project	A full-scale implementation with significant resources attached, clearly defined objectives and an agreed timescale. This type of project lends itself to formal project management techniques.
Institutional Governing Body	The governing body of the institution e.g. University Council or Court
Pilot Project	Projects, usually small-scale, to explore the potential costs, benefits and risks associated with new technologies or systems. The objective of these projects is usually to inform a decision about a larger implementation.
Policies	Documents defining the rights and responsibilities of two or more parties in relation to a particular area of activity.

Procedures	Documents providing guidance in relation to a particular area of activity.
Senior Executive Group	The most senior management group within the institution (e.g. the University Management Group, the University Executive)
Senior Information Systems Manager	The most senior manager in the institution charged with direct management responsibility for information systems (e.g. The Director of Learning and Information Services)
Service Definition Statements	A statement of service availability and service provision. A service statement is much less detailed than a service level agreement
Service Level Agreements	A service level agreement is a formal agreement between a service provider and a service recipient indicating the expected level of service and the rights and responsibilities associated with each party.
Switchover	The ability to switch to standby networks, servers or systems on the event of a technical failure.
Total Cost of Ownership	The total cost of a piece of hardware or software throughout its life. This will include the acquisition cost, on-going support and maintenance costs, etc.
Users	All users of information systems, primarily staff and students within the institution, but also including others who may access information and/or systems through the internet (e.g. potential students, research partners, funders, etc.)