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***FOCUS ISSUE ON LEGACY INFORMATION SYSTEMS
AND BUSINESS PROCESS CHANGE:
THE ROLE OF STAKEHOLDERS IN MANAGING
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ABSTRACT

To manage organisational change in the context of legacy information systems, which may need replacement or revision, the strategy process should respond to corporate opportunity rather than past internal difficulties. Steering groups are often used to guide the strategy process. An important problem is the identification of appropriate stakeholders that need to be represented on the steering group. A related problem is to establish the boundary of the new information system. Computer Information Systems development often focuses on direct users and affected internal departments as the exclusive stakeholders. However these groups may present too narrow a perspective. To improve the effectiveness of the development process, a wider constituency should be considered that includes organisational partners in the wider business environment.

This paper presents a method, the stakeholder web, that identifies appropriate stakeholders and their viewpoints. It illustrates the concepts with a large-scale university information systems project. The stakeholder web is used to analyse the relationships between the activities and membership of a university information systems steering group over a five-year period. The results

demonstrate the dynamic nature of the project and the associated changes in membership of the steering group.

Keywords: stakeholders, steering groups, consultation, legacy systems, change management

I. INTRODUCTION

It is comforting to think of organisational change as engineering a structure to fit a period of relative stability. In an ever-changing world, where organisations must continually seek a competitive edge, such stability is short lived, when it exists at all. A Computer Information System (CIS) therefore faces continual redevelopment to respond to the changing organisational needs.

Management of change, at all levels, needs to be informed and endorsed. Change can only be effective if the plans recognise those who have a stake in the process and they are led to see the value in the new structures or systems. Hammer and Champy [1993] go so far as to argue that the underlying reason for failures in process re-engineering invariably is inadequate understanding or management leadership. This paper concentrates on one particular cause of these problems: the failure to identify appropriate stakeholders. It examines their identification, needs, and representation within the decision process.

Development of new or modified systems in the presence of legacy systems is normal for most companies. Today's new system will become the legacy system in the next, inevitable, round of change. There is a risk in seeing the building of an ideal system while hampered by the presence of a legacy system as a problem of our times. Legacy systems serve critical business needs and therefore the data that is contained within them may be of continuing relevance to their operating needs. Here we take the view that the problem is a continual one of how and where best to deploy effort to keep the systems portfolio in step with organisational needs. This means understanding clearly what such systems can continue to do and the advantages of change before making a decision to replace or re-develop them.

In Section II, we examine the notion of a stakeholder—someone who has an interest in a CIS development and can affect the success of that development [Coakes & Elliman, 1997]. This section describes the complexity inherent in the management of change and in the linkages between participation, systems design and organisational decision-making. In Section III we describe a technique for visualising such situations using a stakeholder web.

In the retrospective case study (Section IV) we show the use of this technique to explain some of the workings of the IS steering group in a university. This study spans a 5-year working period and demonstrates the effectiveness of the technique, which we believe to be sufficiently general as to apply in any organisation. A commercial case study by O'Shea and Madigan [1997] discuss issues relating to lack of consultation of the appropriate stakeholders, which could have been alleviated using our stakeholder webs. Our study also confirms some general lessons about stakeholder involvement, which we draw together in our conclusions(Section V).

II STAKEHOLDERS AND ORGANISATIONAL CHANGE

The word stakeholder was introduced above but we have not yet established its meaning despite its liberal use within the literature of corporate management and information systems development. In establishing a definition appropriate for CIS development it is necessary to consider notions of the system boundary and influences from outside a formal organisation.

STAKEHOLDERS

"Stakeholder" is given a variety of meanings in the literature. Authors usually define the term to support their current argument. Here we follow Freeman's notion of stakeholders in the strategic management field [Freeman et al., 1981; Freeman & Carroll, 1983]. Freeman's work focuses on managerial behaviour and implies a shift towards an action orientation. Freeman demonstrated that it is important not to dismiss the legitimacy of stakeholders because their claims are phrased as moral arguments advanced on their own

behalf. He argues that effective strategy must deal with those groups that can affect the outcome for the organisation and that long-term effectiveness of the organisation depends on affecting such groups.

Several authors advance this pragmatic view. Rhenman [1964] also identifies stakeholders as those on whom the socio-technical system of the organisation depends. By this he means those groups, whether internal or external to the organisation, that can “make a difference”. Mendelow [1984] uses a much narrower definition that only identifies those involved in the actual development, operation and use of the system. Lyytinen's [1988] definition is broader but still limited to internal personnel with a vested interest in the Information Systems. His notion of interest is also limited by requiring a stakeholder to gain a personal or group advantage that accrues from controlling important material or organisational resources. Ruohonen [1991] discusses different internal interest groups stating that the three critical stakeholder groups in the strategic information systems planning process are top management, user management and IT/IS management.

These definitions tend to deny the notion of only considering appropriate demands in favour of the pragmatic test of ability to affect the outcome. However, some carry a flavour of legitimacy in that they consider those who ought to be able to determine the outcome rather than those who can have an effect, legitimate or otherwise. Further, these arguments admit no distinction based on the organisational boundary.

Managers ignore internal and external stakeholders who can affect the success of a development at their peril. For our purposes a stakeholder is someone who has an interest in a CIS development *and* can affect the success of that development.

BOUNDARY-SETTING

Since CIS development is a deliberate attempt to organise a system in a problem free efficient and effective manner, we naturally focus on those parts of the system whose behaviour and interaction we can control. This leads us to

define the system in terms of its automation or technical boundaries as shown in Figure 1. Midgley [1992] criticises this setting of the boundary and points to an alternative perception. This critical setting of the system boundary, determined by examining the viewpoints of stakeholder groups involved in the system, refocuses attention on people and the organisation rather than technical issues.

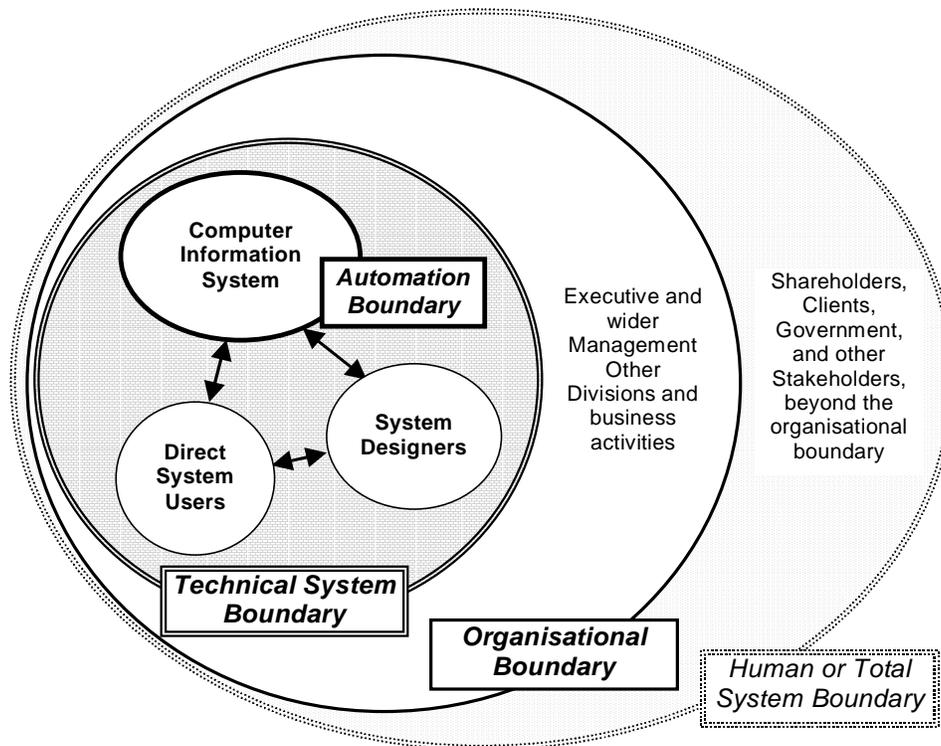


Figure 1. Choice of the System Boundary (after Midgley 1992)

The messages of participative design and enfranchisement of interested parties are well documented [Hirschheim, 1983; Doll & Torkzadeh, 1989; Bjerknes & Bratteteig, 1995]. However, the mode of consultation and the breadth of the franchise is often left to the CIS developers once a corporate change is initiated [Spinass & Ulrich, 1998; Igbaria & Livari, 1995]. Ease of identification and access may in this manner focus on direct users and immediately affected internal departments as the stakeholders to be consulted in such a change.

Although these people are readily identifiable, and easily drafted into the process, it fails to extend significantly beyond the technical boundary.

A particular risk is that close to the technical boundary we will find stakeholders who have extreme views of existing, or legacy systems. The danger is that inappropriate factors may be given more weight than the wider needs of the organisation and its environment. Stakeholders close to the technology can be expected to express their personal investment in the current technology, their detailed experience of operational problems, or their technological bias lending enthusiasm for the promises of new technology. Both strategic CIS planning and detailed development of particular systems and business processes need to see the relevant technical system in terms of its wider context, not just within the organisation but also beyond the confines of the organisational boundary.

EXTERNAL INFLUENCES

Paul [1993; 1994] argues that business and economic systems are dynamic and that information systems development paradigms need to acknowledge the lack of a static reference point. He identifies six environmental changes that have the potential to affect an organisation's CIS needs:

- changes in legal requirements,
- trends in the industry sector,
- changes in the broad economic environment,
- changes in public attitude, expectation, taste or climate of opinion,
- changes in internal management style,
- changes in internal organisational structure.

An organisation's planning processes need to be continually informed of these demands. It is from this perspective that we see development in the presence of legacy systems as a problem that will always be at the heart of information systems development. Much of the stored information and many of the processes may still be usable. Understanding the wider constituency can help decide what can be kept and what must be replaced.

The difficulty comes from stakeholders in other organisations or the wider community not being directly accessible. Therefore, the formal planning structure must provide some voice for these interests and ensure that their needs are given due weight. We contend that the structure will need individuals who, by proxy, negotiate on these stakeholders' behalf. Further, unless the intent is to simply satisfy a stakeholder's demands, or at least accept the consequences of a unilateral decision, some form of dialogue will be needed. In some cases, the public face—that seen by those outside an organisation—of a CIS may be as important as its principal internal products and services. As we shall see in the case study representation of these interests can be an unorganised ad hoc element in current planning structures.

III THE STAKEHOLDER WEB

To grasp of the complexity of the relationship between a CIS and relevant stakeholders we devised a diagrammatic model of such systems—the "Stakeholder Web". The web shows a classification and grouping of stakeholders using a holistic view of the presentation of the situation. This web was first described in Coakes and Coakes [1994] as a means for identifying interested parties and has since been enhanced and adapted.

Figure 2 shows a prototype stakeholder web for a university with the target CIS, the element within the automation boundary, at the centre of a series of concentric system boundaries. Each boundary represents a wider view of the system and its impact. The inner boundary will encompass those having direct contact with the system. Moving out, the circles of influence within the organisation until the organisational boundary is reached. Even wider boundaries may be perceived as social or community structures within which the organisation exists. The total system boundary is not shown in order to emphasise that there is no limit beyond which stakeholders cannot exist. Radiating around the central system the sectors of the web represent different perspectives or positions from which the core system may be viewed.

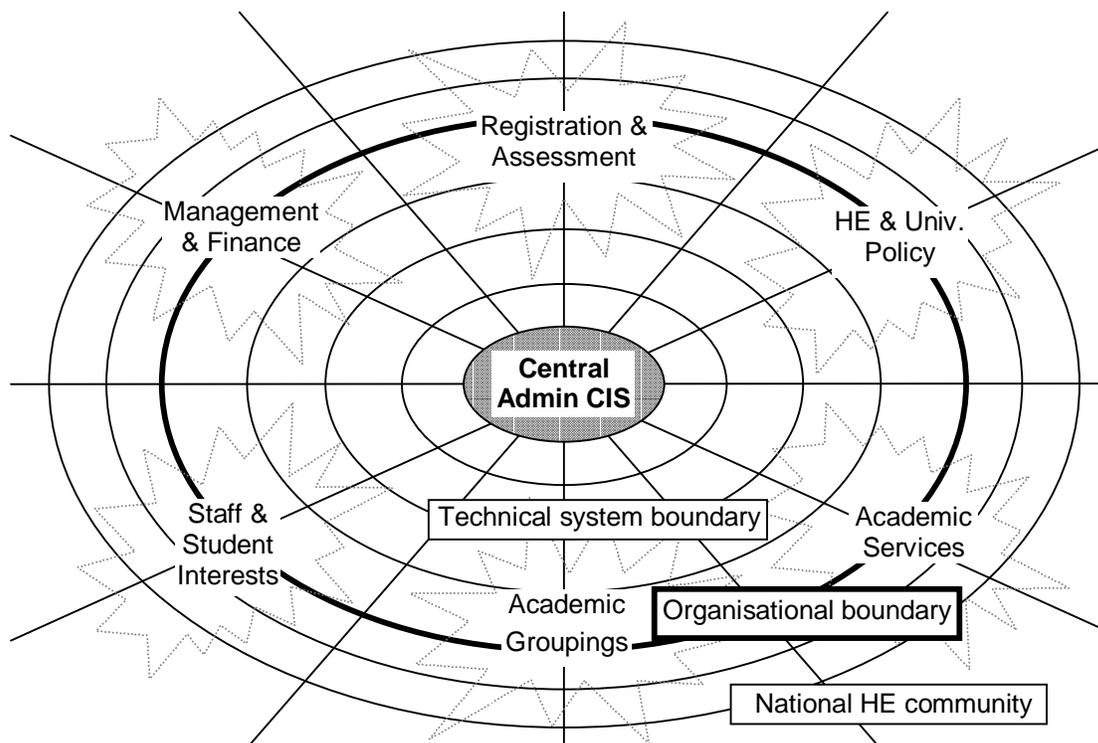


Figure 2. The Stakeholder Web Space for a University

The importance of the web is not in the exact labelling of sectors and boundaries but in seeing the web as a continuum. The sectors and labels shown in Figure 2 are not a prescriptive or a priori model for all webs but, by way of illustration, the groupings that emerged from the case study (Section IV). It should be viewed like a colour wheel with the different sectors representing degrees of similarity and recognising that there is no hard boundary between, say, red and orange. The web is a holistic visual representation that enables us to understand and identify commonalities of interest among stakeholders. Rigid segregation of sectors and boundaries is the antithesis of a such a holistic view. This view is emphasised in Figure 1 by the unlabeled circles and the ragged star bursts on perspective labels in Figure 2. In the case study we omit the labels to force the focus on stakeholders, rather than their exact relationship to any boundary.

The importance of the web stems from its identification of stakeholders who must be consulted, and those who can represent others. From this perspective, the organisational boundary, shown with the heavier line, does take on a particular significance. Stakeholders within the organisation, described as internal, are significantly more accessible because the management infrastructure is in a position to brief such staff and define participation in CIS development as part of their responsibilities. Stakeholders outside the organisational boundary, are relatively free agents able to set the terms on which they participate, if at all. This distinction is important in any discussion of the mechanics of participation but it should not be used as a reason for discounting stakeholders.

Identification of the stakeholders is a process of exploring the web plane looking for interested parties. Our definition of stakeholder (Section II) is essentially a pragmatic test of ability to affect the project outcome. Within the field of information systems the literature from 1963 onwards [Coakes 1997] identifies several themes which capture a pragmatic dimension to justifying a "stakeholder's" participation.

1. Stakeholders may affect realisation or may be affected by realisation of a system;
2. Stakeholders may have actual versus legitimate influence; they may be an internal affector versus external;
3. Stakeholders may have a supportive influence versus conflictive influence;
4. They may be stakeholders of a common value; they therefore need to be considered, consulted, participative, or responsible for process under consideration or development by the system.

As stakeholders are identified they are added to the web allowing us to recognise groups of stakeholders and interests.

Given its focal point—the target CIS—the web diagram should remain otherwise value free. Unlike Clegg [1989] and Introna [1997] it does not depict power relationships or political alliances. Nor does it imply a particular problem

situation as is found in rich picture models [Checkland, 1981; Avison & Wood-Harper, 1990]. The web diagram is not intended to depict stakeholders from some judgmental position such as degrees of power, influence, or interest [Johnson & Scholes, 1999]. In particular, care must be taken not to interpret distance from the central CIS as an indication of importance. Some of the most influential stakeholders may be remote from the organisation. In the following study, examples of such stakeholders are seen in the Higher Education Statistics Authority (HESA) and Joint Information Systems Committee (JISC), public bodies whose work has a significant impact on individual university funding.

If anything, the distance from the centre indicates relevance of the particular target system to the stakeholder's role or interests. For example those within the technical system boundary tend to be involved with the particular system for a significant amount of time and the system tends to influence many of their activities. Hence the particular system, rather than others in the same class, and its detailed interface or operation are relevant to them. For stakeholders further away the target system becomes only one of several which concern them, and only some details of its operation are relevant. Yet further away, particularly outside the organisational boundary, the target system tends to become one of a class and relevant only in so far as it can be seen to affect the organisation's ability to fulfil its role. For example, the relevance of a given university's CIS is seen in terms of its ability to provide accurate statistical data in the appropriate format at the specified time.

Examination of the web shows where gaps may exist. Sketching boundaries and identifying the resultant stakeholders requires sufficient knowledge of the organisation's objectives to suggest sectors of interest and boundaries within the community at large. Such factors as the organizational mission statement and its publicity material suggest the community groups at which it targets its activities and the image and priorities it wishes to portray. Even though we may be dealing with enhancement of a quite specific system, it must still be directed towards the success of the wider organisation.

REPRESENTATION AND CONSULTATION

Once stakeholders, within the human system, are identified, their needs and views have to be represented within the decision making process. As we shall see in the case study, looking beyond the immediate users of the system greatly increases the number of views which need to be addressed. If all of these views are represented 'in person' within a committee or working group it will become unwieldy and slow, unable to make decisions.

This paper is not concerned with the different forms of consultation but the definitions of stakeholder and human system boundary do place some constraints on the consultation process. Framing the terms of reference for consultative bodies and determining their membership impacts development projects crucially. Particular individuals may be appointed to such tasks not only to represent their own interests but also those other stakeholders. In large constituencies, such as a national clearing bank's counter staff, the appointed individuals need to know not only their constituents' needs but also able to negotiate on their behalf.

The important issue is to ensure that the membership of a planning group is representative, balanced and that the individuals are aware of the stakeholder interests to be considered. In some cases members may have particular knowledge of interests in the wider community. For example, academic registrars are in frequent contact with bodies such as HESA and should be well informed of their likely response to strategic plans. Although not present we can describe HESA as being represented by proxy. In other cases group members may only know of a constituent interest generally. In these circumstances a member, or members, needs to be aware of the responsibility to consult and advise the planning body when such action is appropriate.

The stakeholder web is not an alternative to techniques such as Critical Systems Thinking [Flood & Jackson, 1991] or Participative Design [Hirschheim, 1983]. Rather, awareness of the web should inform the choice of participants in activities improving the quality of the process. Given its broad, value free picture

of the influences and interests it should help avoid ad hoc sampling of opinion on particular issues.

The stakeholder web can be used as a reference model for testing coverage as well as forward planning. In the case study (Section IV) we produce webs at the initial and final stages of a system development process to show how the organisation's perception of the relevant interests has shifted. Some evolution is to be expected in any CIS project as discussion with stakeholders will, among other things, reveal other interested parties. In this manner stakeholders will emerge as the development process proceeds, rather than all being discovered before the project commences.

IV CASE STUDY.

The case study involves the University of Hertfordshire in England. The University evolved from Hatfield Polytechnic to become a 'new' university when it received its charter in 1992, together with the other polytechnics. It now covers some 20 sites, with four main campuses in Hatfield, Hertford, St Albans and Watford. These sites are to the north west of London, with no two sites more than about 25 miles apart. The University currently offers more than 400 degree and diploma programmes.

The last decade was a period of significant change in the UK's higher educational sector. Development had to deal with a legacy of inappropriate systems and thinking. Prior to the creation of the Polytechnics and Colleges Funding Council, in 1989, polytechnics were part of the local government provision along side schools for the under 18 age group. Removal from local authority control produced an upheaval in governance; financial and legal status; management styles and structures [DES, 1989] which was compounded by the acquisition of university status in 1992. At the same time the student intake demographics changed. . All these external factors had a profound affect on their internal activities.

The data described below were collected from a retrospective study of historical documents dating back to 1993. This paperwork related to the work of

the Information Systems Strategy Group (ISSG) and its attempts to define CIS development during the period. Using grounded qualitative analysis techniques, the various initiatives considered by the committee were traced through their consideration at successive meetings. In this way an explanatory picture of the outcomes, issues, and roles played by interested parties was formed.

EVOLUTION OF THE INFORMATION SYSTEMS STRATEGY GROUP

In September 1992 a new Student Records System was introduced in the University. In the same year several other new systems were also introduced (buildings and estates, research, and consultancy) and were implemented alongside existing systems for financial administration, personnel etc.

Realising the need for a more strategic approach to CIS development, the Vice Chancellor announced the establishment of a standing committee, the ISSG, in September 1993 [Herts Doc 1]. The eight initial members of the committee were simply nominated by the Vice Chancellor. The Chair came from the Library and Media Services Department; the committee secretary from Academic Registry, the other representatives being one from each of the following departments - the Computer Centre, the Academic Registrar, Management Services, Financial Services, Personnel, and the Deputy University Secretary and Registrar.

Figure 3 shows the initial nominated representation of stakeholders in this apparently arbitrary committee membership. They all represent internal centralised interests and congregate along the management and academic services axes. The two resource committees are represented by cross-membership. There is therefore a tendency for the group to be the central administrators rather than those who provide the institutions main line of business—teaching and research—or those who fund or benefit from the organisations activity. Representatives from the Schools of Study were nominated by October 1993.

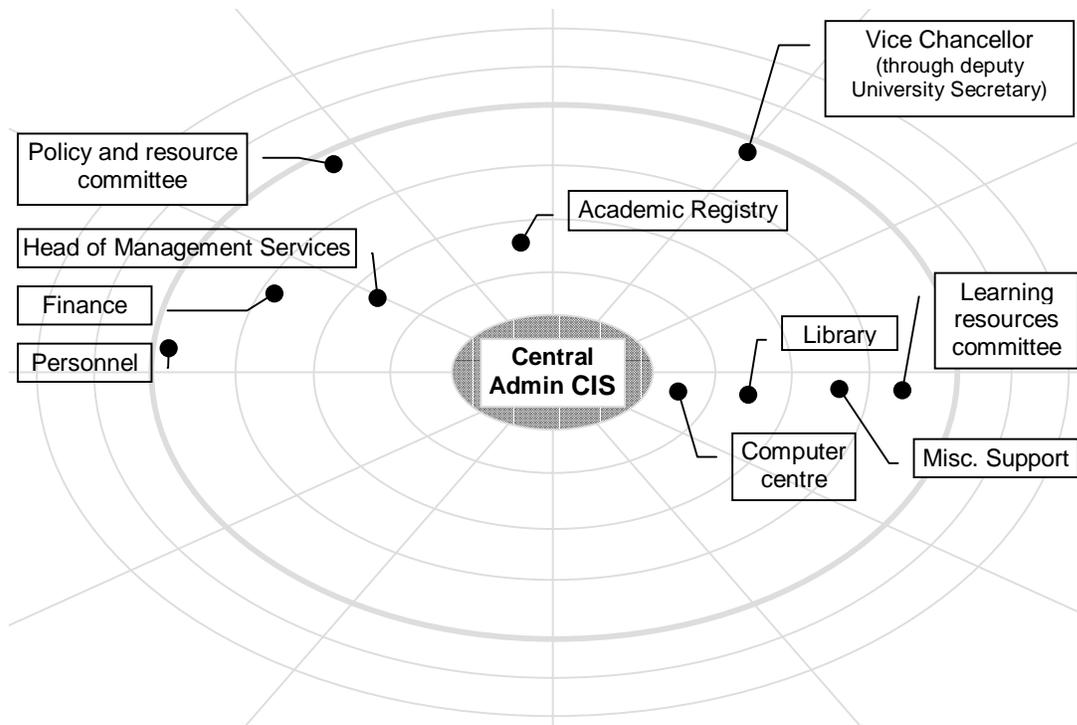


Figure 3. Committee Membership in September 1993

A full discussion of each of these stakeholders is beyond the scope of this paper but by way of example we will consider some of those denoted in Figure 3. The representatives of Finance, Personnel and the Head of Management Services (HoMS) all have roles in the University's management support infrastructure but are distanced from the teaching and research activities. This gives them a commonality of perspective and places them together in the left of the web above the horizontal (see Figure 2). As a key management service the Admin CIS is particularly relevant to the HoMS and finance. However, finance and personnel have wider briefs within the organisation. These stakeholders are placed successively further out from the centre but still within the thick organisational boundary. An element of personnel work is staff development and consideration of staff interests which is taken into account by placing them closer to the "Staff & Student Interests" sector than the other two stakeholders. On the other side of the diagram are the Computer Centre (close to the automation boundary) and the less specialised interests of

the Learning and Resources Committee. These stakeholders are placed away from the management infrastructure in the sectors where the focus is more on the academic aspects of the University. The act of placing stakeholders on the web requires a subjective judgement and one learns as much, if not more, from the discussion and justification, as from the final diagram.

Since its first meeting in 1993, the committee invited non-members to attend meetings or to participate in its activities either directly (for example by commissioning reports) or indirectly through its own consultations. For instance during 1994 and 1995, the committee undertook a large consultancy exercise throughout the university inviting comments on the strategy documents and proposed systems they had put forward.

Examples of additional stakeholders invited to attend were (in 1993) the Head of Student Services, a representative of the Student's Union, (in 1994) a representative from Research, (in 1995) a representative from External Relations. Stakeholders also nominated themselves as needing representation and were invited to join the ISSG. Examples are the Counselling Service and the Student Records Office in 1994, and the Equal Opportunities Officer in 1995.

In addition, the committee, through cross-membership, was represented and had representation from a number of other internal committees, including the Academic Board, the Learning Resource Committee, and the Working Party on Administrative Systems.

By December 1995 there were some 25 official members of the ISSG during the major decision-making cycle of this committee, falling to around 20 in 1997 when the committee was re-constituted. The Information Strategy Committee, as it became in 1998, consisted initially of 11 members but within four months it had increased to 15 as shown in Figure 4. The committee Chair came from the School of Information Sciences, other members were taken from Student Services, Management Services, Learning and Information Services and a representative of the other 7 Schools of Study. Later invited additional members were the Chair of the Learning and Teaching Committee, the Staff

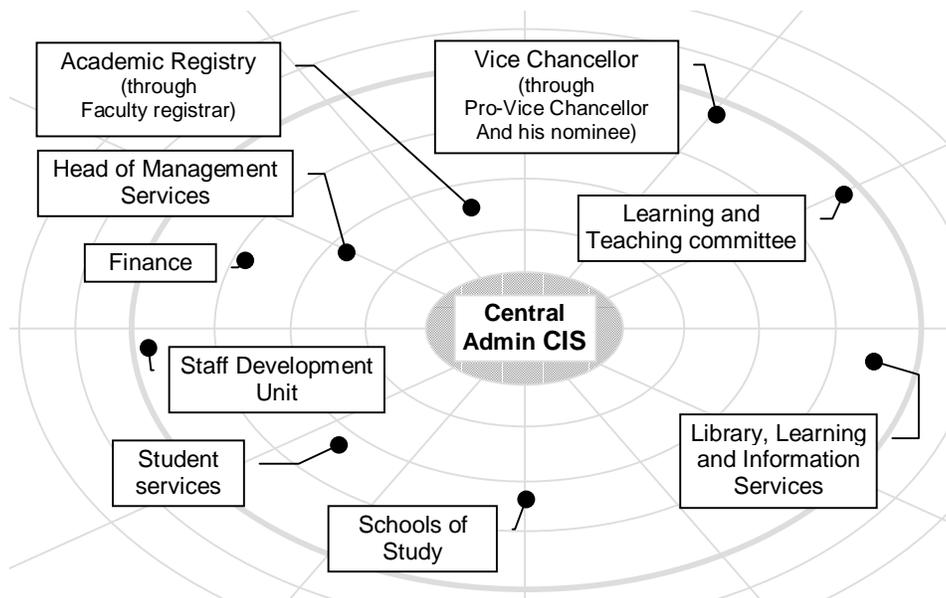


Figure 4. Stakeholder Web Showing the Revised 1998 Committee Development Committee, Management Services and the Pro-Vice Chancellor of Finance and Planning was an occasional attendee.

DRIVER AND INFLUENCER STAKEHOLDERS

The documentation that came out of the committee reveals the concerns of external stakeholders influencing the committee. Some of the stakeholders, both internal and external, can be characterised as drivers because they directly influenced the decisions of the committee. Others can be characterised as influencers because they indirectly affected the activities by being considered when decisions have been taken.

Many of these external stakeholders are governmental bodies (such as the University Clearing and Admissions System (UCAS), and HESA) whose needs for the supply of data and reports are an integral requirement of any university's student record keeping package. These stakeholders are classified as drivers because the university must supply data and reports specified by these agencies. Other external bodies such as JISC were in constant touch with the committee through key members and many JISC papers were considered at

the committee meetings and issues raised discussed. When we look at a web of the interests addressed (Figure 5), the stakeholder representation achieved by the steering group was significant over the working period.

Knowing the actual membership and representation at the ISSG, we turn now to the effectiveness of the body. This issue is addressed in two stages. First we examine the organisation's stated role and goals to see how well they were represented. Second some of the key committee decisions are reviewed. Over the period of this study the committee considered 64 projects (only 16 of which were IS/IT specific). Some 50% of these were never completed within the committee's activities (although some were subsumed into the integrated information system described below - the Student Record System). We discuss 6 projects, which were chosen for because they are representative of committee activity and effectiveness.

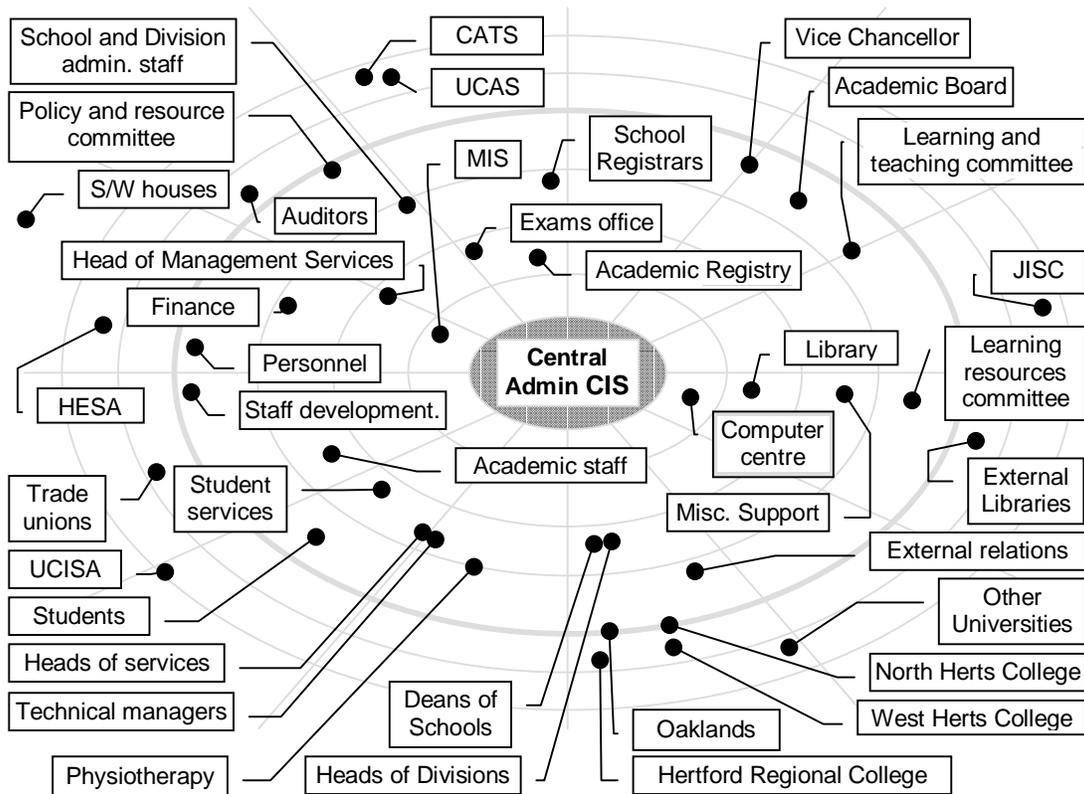


Figure 5. Stakeholders Represented on Steering Group Between 1995-1997¹

REPRESENTATION OF INSTITUTIONAL GOALS

The mission statement for the University reads:

To provide a wide range of higher education with a commitment to excellence in teaching, learning and research and which is responsive to regional, national and international needs. [Herts, 1998]

This mission statement is all-inclusive and shows that, in considering its activities, the University is thinking not just nationally, but also regionally and internationally. There is also a sense of balance between teaching, learning, and research.

The stakeholder web for the initial committee structure (Figure 3) shows very few of the internal stakeholders and certainly none of the external interests implied by the mission. The interests present are mainly administrative or the provision of academic services for teaching and learning support but direct representation of those responsible for the institution's mission is missing. Over the life of the committee, most internal, some regional and some national stakeholders were identified and considered.

However, in relation to the mission, major gaps remain:

- No international stakeholders have been explicitly identified or considered in any of the committee's documentation.
- The main representation of regional interest is through links to four local partner colleges. This risks giving a very biased view of the broader regional needs.
- While a few individuals involved may have research interests, there is no coherent view of the institution's research needs to balance the many aspects of teaching and learning addressed by the membership.

¹ CATS: Credit Accumulation and Transfer Scheme for students moving between universities.

- The current student body, which has a stake in the learning and teaching, is represented but it is not clear how the potential students, those that might be recruited, are represented in the strategy group's decision making.

There is little in the mission statement to differentiate the University within the national Higher Education sector. However, statements in its publicity indicate that its regional perspective is seen as an important differentiating factor. This aspect is represented poorly because within the committee activities no consultation with any regional bodies other than the partner colleges seems to take place. In addition, although some internal documents indicate an increase in the part-time student population at the University, it is not evident where consultation with the community or prospective students feeds into the strategy group.

Even in the reconstituted committee (Figure 4) the Stakeholder Web shows that the representation of broader interests is unclear. As we will see in the next subsection this lack was one factor that affected the quality of the group's work between 1993 and 1997.

COMMITTEE DECISIONS

When we look at the committee papers it is clear that several projects or studies were initiated but never completed and some just disappear with no record of a report back or formal closing of the issues. Such initiatives included:

1. A total package of information services and integrated technologies such as smart cards and document management systems.
2. Links with the associate and partner colleges for the student record system and library systems.
3. The installation of multi-media facilities in student accommodation.
4. A new system for marketing.

These projects appear to be ambitious without clear links to the organisational goals. With the benefits of hindsight and an independent

UCISA: University and Colleges Information Systems Association.

perspective, we might argue that their demise was inevitable. However, more important, is the issue of why they were picked up so enthusiastically by the committee that was intended to make such judgements. The record suggests several explanations for these lapses in interest once projects had been initiated:

- The continual shifts in membership led to key proponents leaving the committee before a problem was resolved. For example, for the Personnel and Payroll system (described below) more than 4 stakeholders were involved at various times, not all of whom have actually sat on the committee, although they may have been co-opted onto working parties. Some of these staff physically left the university before system resolution, others withdrew from the choice process.
- Lack of resources (time and money) and other priorities appearing. For example, official references to the multi-media project (case 3) go as far as a pilot project in 1994/5 and then just cease without explanation.
- Relevant stakeholders were not present, represented or consulted within the committee structure (such as the partner colleges in case 2).

One particular project came to dominate the strategy group's activities: the replacement of the student records system that had specific legacy problems. Although new in September 1992, the system was targeted at the pre-university college structure and inappropriate for the revised institutional status. This committee adopted a search for an all-inclusive integrated system offering: student records, finance, personnel, research, time tabling and more. This objective was ambitious, which some might argue doomed it to failure at the outset. The investigation was wide ranging, looking at commercially developed systems (including ones for the US market) and the JISC sponsored MAC initiative.

It is interesting to note that during this time the Personnel, Payroll and Finance departments also looked at more specialised systems for their own areas. In the end, a Finance system integrated with the Student Record System (SRS) was purchased but a stand-alone Payroll system is operated at an external bureau. A Personnel system integrated with the SRS is not yet fully

implemented by the suppliers, and the Personnel department is continuing to use their legacy system. This outcome highlights a weakness in the ISSG's terms of reference, which may explain a lack of enthusiasm to act decisively for the institution in its activities. The committee had powers only to recommend decisions, not to take them, and it also had no budgetary responsibility. Representing and balancing the interests of different stakeholders is a demanding task and the incentive to attend and make the effort is diminished when the results are perceived to have little impact. An amount of frustration with the time delays inherent in group decision-making through such strategy committees is shown by the number of systems that were developed and implemented by 'executive action' i.e. outside the committee's sphere of influence. An example is the marketing system. Mentions of this system ceased in the official record when the department concerned developed a system for themselves. It is noteworthy that the committee did not have a representative of the marketing function amongst its stakeholders.

Another failing in the group's decision making was the difficulty in separating technology and implementation from strategic decision making. The committee spent much of its time on the all-embracing student record system replacement and its technological issues, a task that should have been delegated. Another example was the campus wide information system. Initial planning was at a level of detail that had to be discarded when the emergence of Internet technology and applications provided a readily implementable solution in 1995

By 1997 the committee itself had recognised these problems in fulfilling its role effectively and recommended a revision of its structure to address its powers, its responsibilities, and to reduce its size. In particular, there was a need to address its relationship to senior executive decisions and validate the group's activities by giving it appropriate authority and responsibility.

DISCUSSION

In this section we showed how organisational goals provide a reference view of the interests in the University's activities in general, and the development of its information systems in particular. Comparison with the webs of actual stakeholder representation clearly indicated gaps in the relevant classes and groups of stakeholders, enabling us to forecast shortfalls within the strategic planning activities. For example, there was a lack of initial consideration of the Student Record Office, which was not rectified until late 1994. Also there is a lack of consideration of the international aspects of the University and international stakeholders such as potential students.

The webs and analysis of the University's mission verified the theoretical perspective that important stakeholders lie beyond the organisational boundary, in its changing external environment. In examining the work of the steering committee, we identified instances where representative members of large groups successfully managed stakeholders' interests. The committee papers also identified several external organisations with a legitimate interest. There was evidence of representation by proxy but this representation was largely ad hoc. For example, the lack of explicit notions of potential students or the interface to partner colleges suggests the representation was not always consistent.

We clearly showed that, although a CIS is usually perceived to lie within an organisation, the relevant interests are much wider. In particular, the organisation's formal boundaries are unrelated to the human system that affects, or is affected by, the CIS. This perspective places existing, or legacy systems in a different light, and to some extent mitigates the trend to see their replacement by new (software) technology as essential to the organisation's survival. The concentration on technology rather than strategic advantage in the student records replacement supports this conclusion.

We are not dealing with a one off change. Legacy systems are not a transitory phenomenon. This view is supported by the fact that although the University changed its Student Record System in 1992, by 1993/4 it was already considering changing again. In continual strategic planning it is necessary for

management to monitor, and regularly review, the relevant stakeholders. The composition of steering groups cannot be left to chance or be left as a small fixed group. The reformation of the ISSG in 1998 was immediately followed by changes. Our analysis indicates that some stakeholder issues remain to be addressed.

It is clear from some of the activities of the members of the committee and members of the University not sitting on the committee, that we must always take into account the issues of power, politics, resistance and influence within the organisation, the Payroll system being an example. (See discussions relating to power and politics in organisations [Handy, 1981; Markus, 1983; Davenport et al., 1992; Morgan, 1997; Silva et al., 1997], especially in relation to information systems, for as Morgan [1997 p.170] says: 'power influences who gets what, when and how'). Resistance to change and a desire to keep control of the decision meant that the Payroll Department maintained use of their legacy system and successfully ensured, during the consultation phase, that any decision on what system they should use was delayed. It is also possible to see the activities of the finance working group as delaying tactics, to again maintain control of the situation and thus power and influence.

V CONCLUSIONS

This paper illustrates the role of stakeholders in driving development and change within organisations. We presented the "Stakeholder Web" as a tool for analysing system boundaries and identifying stakeholders.

We noted the debate that choosing representatives for consultative bodies and determining their terms of references impacts the effectiveness and validity of the decisions made by these bodies. To choose stakeholders who must be consulted directly and those who can represent others, the stakeholder web can be used as a diagrammatic holistic vision of the organisation and the systems under review. The web should be prototyped at an early stage in the formation of the consultative body and can, through use of the themes identified, indicate where gaps in stakeholders exist and improve the representation in the

committee. Since the business environment is continually changing, monitoring a review of the stakeholder constituency and its representation should be a routine task. Throughout, the balance between a complete view of stakeholder interests and a body of workable size needs to be carefully considered and maintained.

The web is also a useful tool when considering wider consultative actions in relation to particular actions. Lessons relating to the development of new strategic information systems, whilst legacy systems are still extant, can also be drawn. Legacy systems will always have both detractors and proponents, usually close to the system. When deciding whether to replace or amend such systems it is necessary to ensure that the wider stakeholder interests are fully represented in the decision making process, so that a balanced view can be taken. The web can assist in this endeavour by indicating the necessary composition of the consultative body.

The exploratory work with the model of stakeholders and the stakeholder web described here is continuing. Although it proved useful in our analyses of the UK higher education sector, it will be important to test its effectiveness in other market structures such as those with extended supply chains.

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LIST OF ACRONYMS

CATS	Credit Accumulation and Transfer Scheme for students moving between universities
CIS	Computer Information System
HESA	Higher Education Statistics Authority: a UK government body responsible for the collection of university statistics and other details used for government funding purposes
HoMS	Head of Management Services
ISSG	Information Systems Strategy Group
JISC	Joint Information Systems Committee: a UK government body that manages and gives advice on university information systems.
MAC	Management and Administrative Computing (Initiative) funded by the Universities Funding Council to jointly develop systems and share the costs of such development.
MIS	Management Information System
SRS	Student Record System
UCAS	The University Clearing and Admissions System is the UK's central clearing house for undergraduate admissions
UCISA	University and Colleges Information Systems Association

ABOUT THE AUTHORS

Elayne Coakes is a Senior Lecturer in Business Information Management at the Westminster Business School, University of Westminster. Her research interests lie in the sociotechnical aspects of information systems and in particular the contribution of stakeholders to the process of computer information systems development. As Vice Chair of the BCS Sociotechnical Group she is active in promoting this view of information systems development and is currently principal editor of a book of international contributions to this field, due to be published early in 2000. She is also involved in a research group, at her university, looking at Learning Organisations and Knowledge Management. She has published a number of conference papers and articles in journals such as *Information and Management*, *Management Decision*, as well as several chapters in books.

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