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THE STATUS OF THE DISCIPLINE OF INFORMATION SYSTEMS

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Abstract

The context of this paper is the recent downturn in information systems (IS) student enrollment which has had negative implications for the academic employment of doctoral students in IS. We regard this downturn as a temporary phenomenon: there have been cycles of enrollments in the past in all disciplines, and these will continue. Indeed, at the time of writing there are signs that the present cycle has bottomed out and student demand for places has increased as the demand for qualified IS people has increased in organizations (albeit with a lag of a few years). This will inevitably lead to an increased demand for our doctoral graduates in universities. Clearly, steps must be taken to minimize such problems in the short term. But in this paper we take a longer-term view. We first examine the status of the discipline of information systems using the cultural web model of Johnson and Scholes (1993). This suggests that there are longer-term problems relating to the status, and therefore the power, of people in the discipline. We must address these underlying problems to ensure there are no similar employment difficulties for our doctoral students in the future. We suggest potential approaches to address the underlying causes of problems revealed using the cultural model. These suggestions include increased representation in formal university power structures, marketing our particular skills and knowledge better both within and external to the university, developing centers of particular IS excellence in our universities, showing how our research is relevant to and can inform other disciplines and being seen as socializing, informing and improving people's work environments and open to different and newer fields of application. But, in particular we argue that independent schools of information systems, information science and the like, might be able to set a more solid footing for information systems people than groups of them in either business schools or computer science and/or engineering departments which are largely their present academic base.

Keywords: Status, power, cultural web, discipline, student enrollment, doctoral students, information schools

Introduction

The context for this paper is the present downturn for the field of information systems (IS). Student demand for courses in information systems has been low. This has led to some courses closing, academic retrenchment and difficulties for doctoral students in information systems finding positions in academic employment. But this is a cyclical phenomenon. The US Department of Labor Bureau of Labor Statistics (2006) predicts that "Employment in the information supersector is expected to increase by 11.6 percent, adding 364,000 jobs by 2014. Information contains some of the fast-growing computer-related industries such as software publishers; Internet publishing and

broadcasting; and Internet service providers, Web search portals, and data processing services. Employment in these industries is expected to grow by 67.6 percent, 43.5 percent, and 27.8 percent, respectively.”

This optimistic scenario will surely lead to a reversal of the present cycle as students see that there is indeed future employment in the sector leading to more demand for our courses and hence for our graduate PhD students in university employment. Indeed there are presently signs of a bottoming out and an upward phase of the cycle to come.

We therefore do not address this paper at ‘present difficulties’ but we argue that unless we intervene, the cycle will repeat itself in the future with perhaps more lasting damage to the discipline. We therefore take a more long term and systemic view in this paper. We argue that there are fundamental problems relating to the status of the discipline in information systems as a whole, and the present negative phase of the cycle merely exacerbates the effect of these more fundamental problems. On the other hand, if we do address these fundamental problems, then symptoms such as low demand for our graduate doctoral students will be far less apparent in the future, even in a downward phase of the cycle.

We use the Johnson and Scholes (1993) cultural model to illustrate this concern in the next section. This model enables us to have a holistic, systemic view of the discipline. Through using the model, signs of a low status discipline are revealed, and this in turn has led to IS groups with low power in their universities. We then go on to suggest ways in which these concerns might be addressed with a view to making the discipline more stable in the future. This ‘basket of suggestions’ relates to increased representation, better marketing, developing centers of excellence, incorporating newer fields of application amongst others. However, in particular, we suggest that independent schools of information may be more viable than the present norm of small groups in business schools or schools of computing and/or engineering.

Status of Information Systems

Avison et al. (1999) looked at the information systems function in business, suggesting that there was an apparent paradox. Information systems have provided dramatic returns for some organizations; they may even underpin most activities, and few organizations can function without adequate IS. Yet, the reliance on information systems and supporting information and communication technologies (ICT) on the one hand is counter-balanced by the low status of the information systems function on the other.

Following Avison et al. (1999) we will use a cultural web model, modified from Johnson and Scholes (1993) to illustrate this paradox, not to focus on information systems practitioners in organizations but to examine a parallel analysis with regard to IS academia. This model is particularly useful at examining the status of the area under scrutiny. Status concerns position, rank and importance. Status is important because low status results in a lack of power (the ability or authority to do something). For example, it is unlikely that a group with low status can gain resources or influence decision-making as much as high status groups. We suggest that this is exactly what has been happening to the academic discipline of information systems. We do not have as high a status as many equivalent disciplines and hence we are relatively under resourced and have less power than we ought.

The assessment of status within a culture is largely a matter of judgment and there is no prescriptive method of assessing that the status of the discipline of IS within the university culture. Morgan (1986) defines culture as “the process of reality construction that allows people to see and understand particular events, actions, objects, utterances, or situations in distinctive ways”. Culture as a metaphor for organisations has been discussed increasingly since the late 1970s. Many authors suggest ways of modelling organisational culture including Kotter (1978), Pettigrew (1979), Peters and Waterman (1982), Deal and Kennedy (1988), and Johnson and Scholes (1993). Here, Johnson and Scholes’ cultural web is employed because of its breadth, extending our study into areas such as stories and myths, rites and rituals, and symbols.

Through using the model, we suggest ways in which IS academics might set about increasing their status and therefore power. This can lead to many benefits including an appreciation of IS groups in universities and a consequent increase in enrollments overall and a demand in academia for successful IS PhD students.

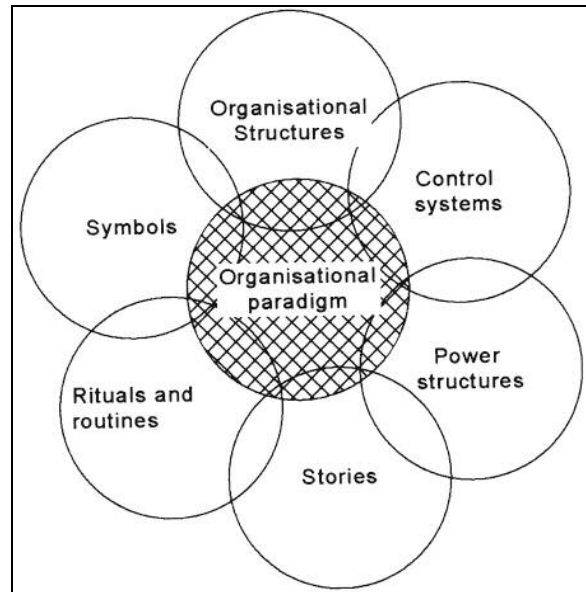


Figure 1. Cultural Web (modified from Johnson and Scholes, 1993)

The cultural web is described by Johnson and Scholes (1993) as ‘a useful tool for understanding the way in which beliefs and assumptions, linked to political, symbolic and structural aspects of the organization, guide and constrain the development of strategy’. With its inclusion of both hard and soft aspects of organizational modeling, and the acceptance of the effect that these elements have on decision making, the model provides a good basis for determining the status of the IS discipline. As seen in Figure 1, the organizational paradigm defined in the cultural model is defined by six factors. By considering all these aspects together at the organizational paradigm level, we are provided with a comprehensive and systemic look at the organization as a whole. We will look at each of these factors in turn to see how the discipline of information systems might be seen as high status or low status.

Organizational Structures

Organizational structures are most clearly and traditionally evidenced in an organization chart showing hierarchy, reporting structures and job grading. In the original Avison (1999) paper, we saw signs of low status through the lack of chief information officers (CIOs) or their equivalent as part of the executive group. It is clear that since 1999 the influence of CIOs in organizations has increased significantly. Prewitt and Ware (2006) report on a survey of over 500 CIOs (or equivalent) and this suggests that three quarters of them are members of the company’s management committee.

However, in universities there are proportionately few information systems heads or ex-heads who are Deans of Business Schools and of course even fewer in the top university administrative position. This suggests an obvious lack of status (indeed of power) of information systems academics. There may be a number of reasons for this, including the aim of founding and developing the discipline in universities, but we need to be less naïve and ensure representation in formal university power structures.

Another indication of low status in universities is the lack of ‘independent’ information systems departments. Some IS academics are in business schools, others in computer science departments, others in operations departments and so on. Indeed, the authors have worked in departments of mathematics, computer science, statistics and *even* information systems (jointly with other groups and independently); in faculties of science, engineering, commerce and information technology; and in universities, polytechnics, grandes-écoles and business schools, *and yet taught the same subject*. This suggests the status of a service group rather than an established academic discipline.

Sometimes the IS discipline is a much smaller group than those for other disciplines, for example in business schools, and this obviously makes them a less powerful voting force and, in general, not in a ‘commanding’ position

– akin to a service function. This lack of status may be even further emphasized in situations where IS groups may be members of the operations department or accounting department in business schools. The parallel in business occurs where the IS manager reports to the chief accountant. Along with groups in business schools, other groups are placed in computer science departments or engineering schools. Again, they often are expected to teach ‘IT in business’ as a service function with a consequent low status.

As *proposed actions*, the disproportionately few information systems heads or ex-heads who are Deans of Business Schools suggests that we need to be less naïve and ensure that ‘our people’ have at least the equivalent representation in formal power structures as other university departments. Without this power, it is evident that IS will ‘lose out’.

One potential reaction is for IS groups to increase their stature by becoming independent units or by incorporating themselves as independent *Schools of Information* or similar units, perhaps in affiliation with computer science, library science, or some management discipline in the short term. A school or faculty of Information Studies with a Dean or Head of School clearly has much greater organizational status than a service department.

Control Systems

High status individuals and groups have control over resources and working practices, including methods of appraisal and reward, promotion opportunities and annual reviews, employee development, and methods of funding and evaluation. In industry this situation has not improved since 1999. Encouraged by Carr (2003) and others, IS and IT continues to be seen as a cost rather than an investment, with the payback period for IT projects reducing from two years to one year and even six months. This reduces the prospect of information systems being implemented that give the firm competitive advantage, which usually needs a longer-term vision, and therefore makes Carr’s prediction self-fulfilling. Prewitt and Ware (2006) show that salaries for CIOs have been declining (minus 1.4% between 2002 and 2005, a period when inflation was 5.4%).

Moreover, despite the evidence suggesting the need for more trained IS staff (SIM, 2007) potential students do not seem to believe it as the recent decline in applications evidences.

In an academic context the ‘appropriation’ of e-commerce teaching and research by some marketing departments from IS groups and ERP and the value chain by operations departments gives an indication of a lack of power. In some universities IS academics service some aspects of these courses, very much paralleling the ‘service view’ of the information systems function in business. This service view suggests IS academics are a ‘cost’ supporting the ‘investment’ in courses for other groups of academics. We should not have allowed this to happen.

As *proposed actions*, we need to be more aggressive in staking our claims to this important area of study and practice. Davis (2006a) argues that we should be positive and aggressive as we have comparative academic advantage:

- The IS academic field understands the IS organization function and what it does that is vital and important.
- The IS academic field has a deep knowledge of technology-enabled organizational systems which are critical in modern organizations.
- The IS academic field has a high level of understanding of systems and systems thinking.
- The IS academic field understands how to model organizational behavior and data.

In claiming this ground we should have status in the academic field as exciting developments seem to occur daily in the potential and actual applications of ICT such that organizations and society at large are being transformed. However, as Gray (2007) argues, we need to convince business that necessary and relevant technological knowledge for managers goes beyond an understanding of Microsoft Office!

Again, the establishment of distinct schools of information could enhance the ability of the IS discipline to define its content, to ward off encroachment from other fields and to define its mandate over all fields of IS activity rather than depending on the single, volatile context of a business or technology school where topics go in and out of fashion regularly. In turn, such schools would achieve a much greater degree of control over resources in their particular academic settings.

Power Structures

We have already suggested that power and status are inseparable. A high status group is able to influence others, taking an active part in decision-making and policy formulation. One problem faced by many of our PhD students is that in most institutions they are one of very few studying for a PhD in information systems. The small cohort gives little 'strength in numbers'.

Further, even where there are a few research students in a department, they are normally not working together in one large-scale research project.

As *proposed actions*, we are not advocating a narrowing of the scope of IS here (Benbasat & Zmud, 2003), but rather suggesting each IS group should specialize more, as was the case with Jay Nunamaker's GDSS team in Arizona. We should be able to draw attention to many such IS groups of excellence.

Furthermore, we argue that the scope of the discipline might be broadened. A survey (discussed fully later) of the programs at thirteen schools of information (or similar) reveals a wide range of program offerings, indeed, 37 different program names were recorded. After combining those with different names but seemingly similar content, 28 distinct program areas were noted. Examples are bioinformatics, healthcare information management, information design, information system economics, library science, and social studies of computing. Many of these are not included in the curricula of IS in business schools. By offering a number of such programs, information schools can enhance their status, increase demand for their courses and increase interaction with other academic units.

Yet again, consolidating as many IT related activities as possible into Schools of Information could also increase the status and power of the discipline, especially as referring to *all* information activities and aspects of information gives such schools greater visibility in academic institutions, in addition to the visibility inherent in independent status.

Another power enhancer can be the support of organizations such as the Association for Information Systems (AIS). Avison (2003) shows how support from colleagues in the discipline through the *ISWorld* listserv gave him the arguments to use as 'fire power' to keep IS as a core course in his business school. The AIS can also be an important lobby group.

Stories

An organization's culture may be apparent through its stories and myths. The stories that are retold may reinforce the status of a group. As showed in Avison et al. (1999), most IS stories told in business reflect negatively on the IS group. Although we can learn much from failure stories, perhaps IS academics have been too willing to discuss IS failures and too reticent to discuss successes. This reinforces negativity towards IS and almost 'asks' for low status. Stories of failure may lead to a reluctance of senior management to share decision making with IS management. But neither are we suggesting 'gloating' as seemingly in 'We were right and they were wrong' the title of an otherwise excellent presentation by John King (2000) – just around the time of the dot.com crash!

We need also to be aware of the impression that we may give the outside world. The contribution of Benbasat and Zmud (2003) led to a particularly interesting debate about what topics should or should not be included in the discipline, but the title of the paper is negative 'the identity crisis within the IS discipline'. This is echoed in Agarwal and Lucas (2005), though their argument 'that the IS community has a powerful story to tell' is 'spot on'. The more confident stance of King and Lyytinen (2003) is also consistent with our argument. They take exception to the 'anxiety discourse ... attributing the anxiety to the field's relative youth, its focus on technology in a technophobic institutional environment, and academic ethnocentrism within and without the field.'

As *proposed actions*, a particularly useful potential contribution of the AIS is embedded in the AIS strategy document (Myers 2006) to establish a Public Relations function to support the marketing of the profession. We have not been good at marketing our domain in the past. There does seem to be a lack of stories on the television putting IS in a positive light. Indeed, for such an important domain, a lack of TV and media exposure in general, and few IS 'personalities' or 'gurus' to sell our positive stories is a lost opportunity. Again, larger agglomerations of IS programs are better placed to publicize such stories. Similarly, well-renowned research groups will give us these positive stories. Furthermore, the larger the unit, the more likely it is to generate newsworthy items.

Rituals and Routines

The organization's rituals and routines may give an indication of what is rewarded and valued by the organization. It is revealing to consider that in business it is the altering or dismantling of rituals and routines of other business activities within the organization that forms a major part of the work of the IS/IT function, and it is not surprising that this may be resented by non-IS staff and any opportunities to 'get their own back' may be taken up.

Hirshheim and Klein (2003) talk about the communication problems or 'disconnects' between the world of business and academia, where the latter are not addressing the needs of the former. Such requirements as the following are perennial concerns that they claim are still not addressed:

- Lowering cost of provision;
- Increasing speed of delivery;
- Comprehensive, cross functional data availability; and
- Leadership in shaping corporate direction.

If we cannot address these concerns we need to say so, but does this mean IS has no relevance? However, we argue that IS academics and practitioners are beginning to address some of these successfully. Firms are reducing investment and targeting IT better; agile development/RAD is addressing speed of delivery; ERP is addressing cross functional data availability; and the role of the CIO is being recognized as an important executive role for the business. Surely we should be claiming some success here?

Hirshheim and Klein (2003) also talk about the 'internal disconnects', that is, disagreements and concerns within the IS discipline. In an academic context, a particularly useful contribution is that of Baskerville and Myers (2002) who suggest that we should change the ritual and routine of using other disciplines to inform us to that of encouraging other domains to use IS as a reference discipline. A look at our papers in Google Scholar suggests that our research output is indeed being referenced in the works of other disciplines.

As *proposed actions*, once again, a broader scope for the IS discipline and consolidation of a number of information oriented units into larger schools could encourage the growth of IS as a reference discipline. As Davis (2006b) points out, *IS is the youngest of the organizational disciplines; consequently it has much room for development*. On the other hand, as Gray (2007) argues, IS has been around for over 40 years and therefore this cannot be used as a defense forever.

Symbols

The status of an individual or group may be evidenced in such symbols as the size and location of their office, make and model of their company car and the like. One symbol of the IS group in universities, but an inappropriate one, is the room full of computers (even used in brochures 'advertising' IS to future students). Many IS academics are seen as being 'stuck in front of their computers' and not socializing enough with colleagues.

Yet if 'information is power', IS should have a high status as it has a major impact on information provision in any organization. According to Gartner (2007) in their survey of over 1400 CIOs, they will need to concentrate on information as a leverage point to enhance efficiency, increase effectiveness and support competitiveness.

As *proposed actions*, it is necessary to promote the idea that IS academics are not 'geeks'. One means of achieving this is presenting faculty seminars on topics of general interest in which information systems play a major role. Globalization (Friedman 2006), online communities, the economics of Internet-related activities, and human capital development (knowledge management) are examples of such topics. Exciting and expanding topics such as bioinformatics, healthcare informatics, command and control, cyber warfare and computer games have been largely ignored by IS academics. One of the problems of being associated with business school activities, is the limiting of the scope of the discipline to the concerns of the business, which is only a part, and perhaps a shrinking proportion of the total field of information systems, at least potentially.

Organizational Paradigm

An overall view of IS may therefore suggest a service function, a secondary activity, with an emphasis on cost control and speed of delivery. The potential for positive organizational transformation and strategic advantage would seem to be neglected. Yet its potential is clear and *is* being realized. Along with the SIM (2007) analysis, the survey of Gregor et al. (2006) of over a thousand Australian businesses shows the realization of business value from IT and IS. We have a good story to tell – we should tell it.

Preliminary Conclusions

In our analysis of the state of the IS discipline using the cultural web model, modified from Johnson and Scholes (1993), we have exposed some weaknesses. These have included:

- Few information systems heads or ex-heads are Deans of schools and above in the university hierarchy which suggests a lack of status and power for the domain.
- The placement of IS groups in so many different schools, faculties and departments, suggests low status and a consequent lack of power, being seen more as a service group than a group important to the strategy of the university.
- The ‘appropriation’ of e-commerce teaching and research by some marketing departments from IS groups and ERP and the value chain by operations departments gives an indication of a lack of power, again suggesting a ‘service view’ with IS academics seen as a ‘cost’ supporting the ‘investment’ in courses for other groups of academics.
- PhD students in Information Systems in most institutions are one of very few studying for that degree. The small cohort gives little ‘strength in numbers’. IS academics are also somewhat isolated in small groups and therefore have little power.
- Most IS stories told in business and retold in academia are negative stories suggesting failure of various kinds and these reflect negatively on the IS group and reinforce low status.
- IS academics have not been good at marketing our domain when compared to other disciplines, and this has undermined potential status and power.
- There are a lack of positive stories on the TV putting IS in a positive light, indeed for such an important domain, a lack of media exposure in general, and few IS ‘personalities’ or ‘gurus’ to sell our positive stories .
- There has been too much reliance in IS research on foundation disciplines and not enough exposure of IS research to other disciplines.
- Too often our discipline is associated with a room full of computers and IS academics seen as geeks being ‘stuck in front of their computers’ and not socializing enough with colleagues.
- The discipline has – for whatever reason – chosen some topics as within its scope and other areas, such as bioinformatics, command and control, cyber warfare and computer games as outside its scope. This reduces its potential, and also its defensive position where some topics become less interesting to potential students.

In our analysis, we have suggested a number of proposed actions:

- IS academics need to have at least the equivalent representation in formal power structures as other university departments so that IS does not lose out in the normal political maneuvering.
- We should be positive and aggressive as we have comparative academic advantage in that IS academics understand the IS organization function and what it does that is vital and important. We have a deep knowledge of technology-enabled organizational systems which are critical in modern organizations and a high level of understanding of systems and systems thinking and the ability to model organizational behavior and data.
- Research groups might specialize more, working together in one large-scale research project, hence giving more ‘strength in numbers’ and enabling ‘centers of excellence’ to be established and publicized.
- We need to encourage all IS academics to join the AIS as it provides potential support for IS academics through the listserv, ISWorld and other facilities. The AIS strategy document (Myers 2006) includes the important action to establish a Public Relations function to support the marketing of the profession. We support this action fully, but for it to carry full weight, membership needs to include a high proportion of IS academics.
- We need to encourage other domains to use IS as a reference discipline and show how our research output is indeed being referenced in the works of other disciplines.
- IS academics need to be seen as socializing, informing, improving people’s work environments, rather than as people dominated by technology, through public relations and other means.

- IS academics need to be more open to new fields of application.

If we deal with these broader issues then the discipline might be less susceptible to downturns and symptoms of cyclical problems, such as PhD graduate employment, should be less apparent in the future. However, in our discussion of the Johnson and Scholes cultural model, it has been noticeable that the proposal of separate schools of information science, or the like, would seem to address, at least to some extent, concerns exposed relating to all six factors included in the cultural web. We therefore discuss this suggestion more fully in the next section.

Independent Schools of Information

We have drawn attention to weaknesses in the structure of the IS discipline in its current, usual academic and organizational context. There are a number of *potential* gains in organizing ourselves, where possible, as independent schools of information, information science and the like. This might give us a more independent posture with multi-contextual relations. This could also facilitate a broadening of the scope of the discipline from a business or computing and engineering orientation to one embracing all IS phenomena. Such an arrangement has the potential to enhance the ability of the IS discipline to define its content, ward off encroachment from other fields and define its mandate over all fields of IS activity rather than depending on a single, volatile context. In turn, such schools might achieve a much greater degree of control over resources in their particular academic settings. Larger agglomerations of IS with related programs are better placed to exert power in the university, have more impact and publicize positive stories.

The establishment of independent Schools of Information – named variously as colleges, schools or faculties – is clearly on the rise. Gray (2007) identified nine such schools from two Google searches in the first two pages of responses. The I-Schools project (<http://www.ischools.org/oc/>) lists 19 schools that participated in its 2006 conference. The Project Steering Committee is composed of deans of such schools. The IT Deans Group of Computing Research Association (<http://www.cra.org/Activities/itdeans/participants.html>) lists 47 member schools as of August 2007. Of the 47, only four of those listed are from outside North America, but we have identified others in Australia and elsewhere (see below). King (2007) estimates the total number of I-schools at 75-100. Further, King notes that the expansion in the number of I-schools “coincides with the collapse of enrollments in computer science and information systems programs.” It should be noted however, as detailed below, that a number of I-school deans responding to our survey did not think that their schools fared any better than other IS departments in the enrollment falloff.

In order to investigate further the I-school option, we sent out the following brief questionnaire in an email to the heads of eleven independent schools of information or similar:

- What, in your opinion, are the major advantages of stand-alone Schools of Information?
- How do stand alone schools compare with IS departments in Business Schools and Computer science/computing schools?
- How do you think student enrollment and faculty recruitment in Schools of Information compares with those in business school or computer science/computing IS departments in recent years?
- May we quote your comments?

We received five responses and all respondents gave permission to quote them. The full responses will be provided on request from the authors.

The responses we received from the scholars surveyed are summarized in Table 1 in the context of the Johnson and Scholes (1993) cultural web model. Where more than one respondent refers to an issue, the degree of consensus is higher. The responses concerning enrollments are added at the end of the table being of specific concern in the context of this paper. Following the table we present our main findings relating to the cultural web model elements.

Table 1. Citations in the Context of the Cultural Web Model

Cultural Web Elements	Respondent
Organizational structures	
... a standalone school must recognize that it needs some outside disciplinary support, so should not become overly insular.	LO
I-Schools' faculty tend to be highly multidisciplinary, drawing scholars from the liberal arts, the sciences, and engineering.	RL
A major focus is our working together to leverage our multidisciplinary capabilities.	RW
Other schools (as context) can provide a broadening of focus for IS	GF
It seems to me that where a program is located is the result of someone in the administration or a dean having the concept and carrying it through.	PG
Size and development of critical mass.	GF
Control Systems	
Focus on IS as the mainstream of the School	GF
A standalone School of Information has natural advantages over a Department of Information embedded in a larger School with respect to curriculum design and vision	LO
Standalone schools have a much more focused information-based curriculum, that is, it can offer a much richer set of courses in the specific discipline.	LO
... stand-alone schools allow students to be exposed to the broad base of disciplines that underpin IT (from the artistic, social, multimedia, information systems end of the spectrum right through to the computer science, software engineering, digital systems end of the spectrum).	RW
Power structures	
Ability to run specific degrees in IS rather than just service courses	GF
When embedded in business or computer science, IS winds up being a second class citizen once it is out of favor.	PG
With respect to vision, it is much easier for a standalone school to shape its direction without having to have this confirmed by disciplines that do not have much to add to the information discipline.	LO
Stories	
They (I-schools) have to stand on their own in terms of student numbers, research, etc. and cannot be 'hidden' by other stronger subjects.	GF
IS has to be made relevant to other domains	GF
Invariably, Information Schools use the tri-gram of <i>people-information-technology</i> when describing their work.	RL
... the focus on information has distinguished Information Schools from CS and MIS programs	RL
In the context of research, stand-alone schools facilitate multidisciplinary research. In my own faculty, we have won some major research grants simply because we had colleagues on the research team who could cover all the IT disciplines.	RW
Rituals & routines	
Coherence and absence of battles about what is IS and whether it is relevant, etc. although they still have to be had with the University at large.	GF
Symbols	
... a "stand-alone" institution, be it a department, school, or college, bears witness to its integrity as an area of scholarly study and its value to the understanding and advancement of contemporary society.	RL

Cultural Web Elements	Respondent
The focus of Information Schools is on the theories and principles underlying the use of information by individuals and organizations through technology.	RL
Enrollment	
IS enrollments have suffered in comparison to Business courses but Computing has also suffered	GF
Since 2001, all of these programs have witnessed very similar enrollment trends. ... industry demand for graduates from I-Schools may recover more strongly than for CS	RL
Information-related disciplines have lost enrollments at a similar rate to business schools and computer science/computing schools.	LO
I think we've all suffered with the major fall in enrollments. I'm not sure one model has fared better relative to the other model.	RW

Respondents: (in alphabetical order)

- GF Guy Fitzgerald, Brunel University
- PG Paul Gray, Claremont Graduate University
- LO Lorne Olfman, Claremont Graduate University
- RL Ronald Larsen, University of Pittsburgh
- RW Ron Weber, Monash University

Organizational Structures

A major theme from the responses is that I-schools should be multidisciplinary in nature and also draw on other disciplines. (LO, RL, RW) It was also noted that being in another school can broaden the focus for IS (GF) Additional themes were that I-schools can generate critical mass (GF) and that such schools arise when a decision maker has the vision and carries it out. (PG)

Control Systems

The respondents point out that in an I-school, information is the main focus (GF) and the result is much richer curricula (LO, RW).

Power Structures

I-schools can shape their activities independently, without requiring approval of other disciplines and without dependence on other disciplines in determining their status. (GF, PG, LO)

Stories

The focus on information, multidisciplinary, and the people-information-technology paradigm distinguishes I-schools from other IS programs. On the other hand, such schools must stand or fall on their own merits and must be made relevant to other domains. (GF, RL, RW)

Rituals and Routines

I-schools do not have to contend, as do embedded IS departments, with other disciplines on their nature and relevance, although this contention must still be carried on with the institution at large. (GF)

Symbols

Independent I-schools can better tell the story of the importance of information and IS to society at large and can better establish their credentials as an independent area of scholarship. (RL)

Enrollment

The final question in the survey related to enrollments and faculty recruitments. It asked whether I-schools had fared any better than IS departments in business or computer science schools. The consensus of those who answered this question was that they had not. (GF, LO, RL, RW) However, there still remains the question whether schools with

multiple program offerings fared any better than those with few programs. We do not have data and the sample employed is clearly too small to provide any meaningful results. However, this is a research question worth pursuing. Comparative data for traditional IS departments and information schools, and between different information schools might offer some interesting insights.

Program Offerings

An important part of our argument is that independent schools of information can offer a broader range of programs. It is to be hoped that such broad offerings could cushion some of the effects of cyclical downturns in enrollments. Thus, in addition to surveying heads of I-Schools, we analyzed the range of program offerings of thirteen schools including those named by Gray (2007). It should be stressed that this analysis is based on publicly available program descriptions on the schools' Web sites; in some cases these may not be entirely up to date and it is possible that we occasionally misinterpreted the information provided. The thirteen institutions with independent schools that we surveyed were Brunel University, Claremont Graduate University, Monash University, Penn State University, Queensland University of Technology, Rutgers, Syracuse University, University of California, Berkeley, University of Michigan, University of North Carolina, University of Pittsburgh, University of Texas, Austin, and University of Washington.

As mentioned earlier, the analysis yielded 37 differently named programs; after eliminating apparent redundancies, 28 distinct program groups remained. These are exhibited in Table 2.

Table 2. Graduate Programs of Study at Thirteen Information Schools

<i>Graduate Programs</i>	Brunel University	Claremont Grad U	Monash University	Penn State U	Queensland U Tech	Syracuse University	Rutgers, University	U of California Berkeley	University of Michigan	U of North Carolina	University of Pittsburgh	U of Texas, Austin	University of Washington
Applied Information Technology			X										
Archives and Records Management									X				
Bioinformatics	X												
Business Systems			X										
Business Systems Integration	X												
Community Informatics									X				
Computer Science			X										
Digital Communications			X										
Enterprise and Distributed Systems Development	X												
Health Care Management Healthcare Information Systems Management	X	X											
Human-Computer Interaction								X					
Incentive-Centered Design									X				
Information Analysis and Retrieval									X				
Information Assurance								X					
Information Design								X					

Graduate Programs	Brunel University	Claremont Grad U	Monash University	Penn State U	Queensland U Tech	Syracuse University	Rutgers, University	U of California Berkeley	University of Michigan	U of North Carolina	University of Pittsburgh	U of Texas, Austin	University of Washington
Information Economics								X					
Information Management Information Management and Systems	X	X	X		X	X			X				X
Information Policy								X	X				
Information Science Information Technology Information Science & Technology	X		X	X	X					X	X		
Information Studies Library Science Library and Information Science Library and Information Services School Library Media						X			X	X	X	X	X
Information Systems		X											
Multimedia Computing	X												
Network Computing			X										
Preservation of Information									X				
Social Computing									X				
Social Studies of Information								X					
Software Engineering & Data Communications					X								
Telecommunications Telecommunications and Network Management						X					X		

In Table 2, we see that the number of program groups per school varies from seven to two. The table reveals that three program groups are by far the most prevalent. These are:

- 1) Information Management, Information Management and Systems
- 2) Information Science, Information Technology, Information Science & Technology, and
- 3) Library Science, Library and Information Science.

Groups 1 and 2 are, by and large, the classic IS graduate programs. Group 3 comprises the classic library science programs. However, there are some innovative programs amongst them that would be unusual in business school settings.

Similarly, an analysis of the program offerings of schools in the I-schools project reveals great variance in the number and content of program offerings. To take some extreme cases, and mindful of the cautions above concerning such analysis, and considering only graduate programs, we find the following:

- The School of Information at the University of Texas at Austin offers one graduate program – Information Studies. *U.S. News and World Report* ranked the School of Information among the top ten Library and Information Studies (LIS) programs in the nation. Two additional schools in similar mode are Rutgers School of Communication, Information and Library Studies, and the University of Toronto Faculty of Information Studies.

- At the other extreme (not in the table), in its School of Information and Computer Science, the University of California, Irvine offers twelve programs spanning much of the IS/IT universe - Arts Computation Engineering (MS), Information & Computer Science (general MS), Computer Science (MS & PhD), Embedded Systems (MS), Informatics Track in General Informatics, (M.S. and PhD.), Informatics Track in Interactive and Collaborative Technology (M.S. & PhD.), Informatics Track in Software (MS & PhD), Informatics in Biology & Medicine (MS & PhD), Knowledge Discovery and Data, (MS only), Networked Systems, (MS & PhD), and Statistics (MS & PhD).
- Somewhere in the middle between the extremes, with seven programs spread over two campuses, the Indiana University School of Informatics offers broad scope; the programs are Bioinformatics (MS), Chemical Informatics (MS), Computer Science (MS, PhD), Health Informatics (MS), Human-Computer Interaction Design (MS), Laboratory Informatics (MS), and Media Arts and Science (MS).

It is worthy of note that the five schools mentioned in the previous paragraph, with one exception, also have IS departments embedded in their business schools. The lone exception is the University of Toronto.

Of the fifteen members of the I-schools Project, all but two offer Ph.D. Programs.

We draw two speculations from the preceding analysis. The first is that information system departments embedded in business or management schools deal with essentially a small, and quite possibly diminishing, niche of the information systems field. The second is that it is quite possible that the existence of both embedded and independent information system units in the same institutions is causing confusion about the essence of the IS field. It has been difficult enough to explain what we meant by “information systems” and IS programs when most of them were in business schools and dealt with business information systems only; as the number of independent and diversely oriented schools grows, this becomes even more difficult and may be confusing and diverting students from the field.

Conclusion

We think it is important to distinguish between the long and short terms in addressing IS enrollment problems. In the short term, business demand for our graduates is increasing and this will lead to increased demand for IS courses. Indeed the greatest danger is not continuance of the present gloom but that there will be under-supply as a new boom to bust scenario looms. But, in any case, there will be increased employment opportunities for our graduate PhDs in the near term. But this paper reflects an attempt to take the longer term view with the aim of increasing stability in demand for our courses and thereby our PhD graduates to teach in these programs.

We have argued that there are a number of longer-term weaknesses related to the IS discipline and we have suggested a number of actions to help counter these weaknesses. These suggestions include increased representation in formal university power structures, marketing our particular skills and knowledge better both within and external to the university, developing centers of particular IS excellence in our universities, showing how our research is relevant to and can inform other disciplines and being seen as socializing, informing and improving people’s work environments and open to different and newer fields of application.

With regard to our suggestion of independent schools of information science, or the like, there is certainly potential for longer term stability in the IS discipline, but our research is incomplete as yet and the responses to our questionnaire are mixed, and we therefore suggest that the topic be researched further and the debate be furthered in the upcoming months.

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