Fitzgerald, B. and Adam, F. (1996) The Future of IS: Expansion or Extinction?, *Proceedings of First Conference of the UK Academy for Information Systems*, Cranfield University, 10-12 April 1996.

The Future of IS: Expansion or Extinction?

Brian Fitzgerald and Frederic Adam

E-Mail: bf@ul.ie

Fitzgerald, B. and Adam, F. (1996) The Future of IS: Expansion or Extinction?, *Proceedings of First Conference of the UK Academy for Information Systems*, Cranfield University, 10-12 April 1996.

The Future of IS: Expansion or Extinction?

Abstract

What the future holds for the IS field is not all that clear. On the one hand, it could be argued that IS could become the primary organisational and management discipline, given the primacy of IS for such critical organisational issues as business process reengineering, competitive advantage, employee empowerment, informating the workplace, the virtual organisation and telemarketing. On the other hand, just as the opportunity for IS to become a dominant discipline presents itself, there is, rather ironically, a very real threat to the future status of the field itself. This is evidenced by the fact that many IS/IT programs are being 'downsized' at undergraduate and graduate level. Also, IS departments in universities are facing the threat of hostile colonisation by sister departments from other disciplines. Indeed, there is a very real risk that in the absence of an intellectual core of research questions, protocols and standards in the IS field, other disciplines may lay predatory claim to 'traditional' IS research issues on the grounds that these issues do not actually require an IS research focus, but can be adequately researched within these disciplines themselves. This paper considers the evolution of the IS field and identifies a number of fundamental problems in the field, which have arisen as the field has evolved. These include a failure to establish an intellectual core of widely-accepted 'first principles'; an identity crisis in so far as IS has not carved out its own niche in either academe or industry; the lack of a cumulative tradition, as researchers choose to ignore or contrive to differentiate their research from that which has gone before; the absence of barriers to entry in the field, thereby allowing open access to researchers from a wide variety of disciplines; the breadth of the area, where a proliferation of literally thousands of potentially relevant journals further fragment the field; a 'reference indiscipline' problem as researchers abuse or misuse the research results and traditions from the vast range of research areas that are seen as related; and finally, a trend towards divergence rather than convergence in research being conducted in the field. Drawing on examples from other disciplines which have achieved maturity, the paper concludes by proposing an agenda for progressing the field towards a mature discipline, which could subsume other fields to become one of the primary organisational disciplines.

The Future of IS: Expansion or Extinction?

1. Introduction

The IS field is currently at a critical point in its history. On the one hand, the tremendous significance of IS/IT issues for industry indicates that an opportunity may exist for IS to become perhaps the primary and overarching discipline to address organisational and management issues in an appropriately balanced socio-technical context. Thus, IS research is at the forefront of a number of current core organisational initiatives such as business process reengineering, downsizing, competitive advantage, employee empowerment, informating the workplace and the emergence of radically new managerial concepts such as the virtual organisation or telemarketing. On the other hand, just as the opportunity for IS to become a dominant discipline presents itself, there is, rather ironically, a very real threat to the future status of the field itself. This is evidenced by the fact that many IS/IT programs are being 'downsized' at undergraduate and graduate level. Also, IS departments in universities are facing the threat of hostile colonisation by sister departments from other disciplines (cf. Stein, 1995). Indeed, there is a very real risk that in the absence of an intellectual core of research questions, protocols and standards in the IS field, other disciplines may lay predatory claim to 'traditional' IS research issues on the grounds that these issues do not actually require an IS research focus, but can be adequately researched within these disciplines themselves. This predatory phenomenon is not unique in the history of the sciences. Latour (1988), for example, provides historical examples of fields whose subject matter was usurped by other disciplines.

This paper considers the evolution of the IS field and identifies a number of fundamental problems in the field which contribute to the unstable situation described above. Drawing on examples from other disciplines which have achieved maturity, the paper concludes by proposing an agenda for progressing the field towards a mature discipline, which could subsume other fields to become one of the primary organisational disciplines.

1.1 Summary of Problems in the IS Field

When one considers the evolution of the IS field to its present status, a number of fundamental problems can be identified. These include:

- A lack of first principles as a stable and widely-accepted conceptual foundation has not yet been established in IS.

- An identity crisis in so far as IS has not carved out its own niche, neither academe, nor in industry where it faces the threat of outsourcing or end-user control.
- A lack of a cumulative tradition, as researchers choose to ignore or contrive to differentiate their research from that which has gone before.
- An absence of barriers to entry in the field which is allowing open access to the IS field by researchers from a wide variety of disciplines—a mixed blessing which has not always helped efforts to achieve progress in the field.
- The breadth of the area, where a proliferation of literally thousands of potentially relevant journals further fragment the field.
- A 'reference indiscipline' problem as researchers strive and sometimes fail to comprehend the research results and traditions from the vast range of research areas that are seen as related.
- A trend towards divergence rather than convergence in research being conducted in the field

These problems appear to be causally inter-related as each problem contributes to the emergence of another. Thus, the problems can be viewed in terms of chronological phases in the history of IS as it has evolved. By drawing in foundational concepts from other fields, the infant IS field created bridges to other disciplines, over which researchers have been only too willing to cross (no barriers to entry). The vast amount of research in these related disciplines (breadth of area) has created a huge intellectual investment dilemma for IS researchers who have to comprehend the vast range of research traditions and findings from all these areas (the reference indiscipline problem). This diversity creates a large number of divergent steams of research into essentially the same phenomena which further inhibits the progress of the field towards the establishment of first principles.

1.2 The Emergence of the IS Field

The emergence of IS as a discipline has been due in large measure to the inadequacy of computer science in addressing the problems associated with the use of computers in an organisational or business context (cf. Jayaratna, 1994). The computer science influence caused a tendency to view the field in narrow technical terms, whereas a wider focus is necessary, both on the application and management of technology, and also its wider social implications. Computer personnel have been accused of letting the technology drive the application, rather than vice-versa—the "have technique will travel" phenomenon identified by Heany (1965) whereby computer technologists had become so engrossed in the technical aspects that they failed to pay adequate attention to the wider managerial and social aspects. The primary focus was on getting technical aspects right—improving speed of data access, for example. However,

instant access to data is not necessarily useful if it is not relevant to the business situation.

A number of disciplines have been primary contributors to the emergence of the IS field, including computer science, management science and organisational science (Culnan & Swanson, 1986). There have also been a host of supporting disciplines, including psychology, sociology, statistics, political science, behavioural science, economics, philosophy, mathematics (Bariff & Ginzberg, 1982; Boland & Hirschheim, 1987; Kriebel & Moore, 1982; Nolan & Wetherbe, 1980). Indeed, Keen (1991) has remarked, the IS field has nothing unique in terms of either topics, theory or methodology, since these have been borrowed from other fields.

However, the IS field is not alone in having an eclectic and pluralistic foundation. Indeed, it is quite natural in many emergent fields to borrow a foundation of usable knowledge and concepts from more mature disciplines—the emergence of psychology from psychophysical philosophy being a well-documented example of a discipline which emerged and compartmentalised in a stable fashion, albeit after about one hundred years (cf. e.g. Bunge & Ardila, 1987; Hearnshaw, 1987). Having a wide breadth of contributing disciplines can bestow advantages in a field in so far as research can be illuminated in many ways with many differing conceptual schemes. For example, Gould (1986) describes how Darwin's confidence in his theory of evolution was influenced by his reading of Adam Smith's *The Wealth of Nations*, as the principle of natural selection has parallels in the principles of the competitive market economy.

The IS field did indeed benefit in the early days through contributions from other fields. For example, Kendall and Kriebel (1982) discuss the contributions made from management science/operations research in the areas of modelling and decision making. These contributed greatly to the emergence and coalescence of the Decision Support Systems (DSS) area. However, the symbiotic benefits which could arise from its multi-disciplinary conceptual foundations have not brought about long-term dividends in the IS field—the DSS story itself does not have a happy ending, as the field is acknowledged as having been weakened by an abundance of trivial academic research (Keen, 1991; Paller & Laska, 1990). Rather, the multi-disciplinary nature of the IS field has led to a number of significant problems. These are discussed in the following section.

2. Fundamental Problems in the IS Field

This section discusses some of the major problems which have arisen in the IS field, as summarised above.

2.1 A Lack of First Principles in IS

Definitional problems abound in the IS field; so much so that the IS field may be characterised more as a definitional quagmire rather than multi-disciplinary. Indeed, there is not even agreement on the name of the field itself (Bacon, 1996). When one considers even the word *information* in the term itself, problems become apparent. Many researchers seem content with a definition which views information as processed data with attributes such as relevance and timeliness. However, researchers such as Stamper (1973, 1993) have long argued that such a definition is in itself inadequate. This quagmire is again evident when one considers the variety of definitions which have been proposed for the central term, *information system* (e.g. Ahituv & Neumann, 1990; Davis, 1974; Hicks, 1993; Jayaratna, 1994; Kendall, 1992; Kenneron, 1970; O'Brien, 1993; Reynolds, 1988; etc.).

An analysis of a sample of these definitions reveals an unnecessary abundance of definitions of the actual term information system, some of which take a broad focus to include managerial and social issues, while others take a narrower computer technology focus, viewing the computer as a necessary *and* sufficient component for IS. There is an attempt, therefore, on the part of some researchers to define the term at a logical level which, even if it emphasises the *processing* of information, stays above its physical manifestation which probably involves a computer (Jayaratna, 1994).

2.2 The Identity Crisis in IS

A striking symptom of the failure of the IS field to establish its own identity is evident when one considers that IS departments in academe have not yet carved out their own individual departmental status; nor have they achieved uniformity in the academic departments in which they have become a sub-discipline. Thus, IS may be found in many diverse departments, including Accounting, Statistics, Economics, Computer Science and Electrical Engineering. This does not help the discipline establish a solid and uniform identity.

This fragility of the status of IS has parallels in industry where the IS area is often subordinate to another functional area such as Finance or Accounting under the authority of those who do not necessarily have any understanding of IS matters (Finnegan, 1991). Nowadays, the risk of IS losing control of its own affairs is even greater as many organisations consider the outsourcing of their IS activities as an attractive alternative to developing (or maintaining) an in-house pool of IS expertise. Needless to say this increases the risk that IS will be largely ignored by managers and that the contribution of IS to the management of organisations is reduced to the bare minimum—i.e. the support of administrative tasks.

2.3 Lack of a Cumulative Tradition

The IS field has been characterised by Banville and Landry (1989) as one of "fragmented adhocracy". There are some islands of cohesive thought, but no overarching conceptual roof. At a very fundamental level, the failure to abstract foundational theories and concepts from the contributing disciplines means that the IS field lacks a unifying paradigm for the orderly and cumulative acquisition of knowledge. The importance of such a cumulative tradition has been emphasised, most notably by Keen (1980), as being a critical requirement for the field. However, the absence of such a cumulative tradition has resulted in problems. For example, very few research papers arise (or at least are acknowledged as arising!) from the call for further research which is routinely advocated in the conclusion section of many academic papers. Teng and Galletta, in their 1991 survey of IS researchers' perception of the field, report that the majority of respondents were of the opinion that IS research has failed to build a cumulative research tradition. This was corroborated by the finding that IS researchers virtually never rely on existing frameworks developed by other researchers. This is a matter of worry for IS research, given Naumann's (1986) persuasive argument that, in new fields of research struggling to develop theories, "pre-theory frameworks" should be used to guide research activities. As noted by Teng and Galletta (1991), this might be an indication of a need for "greater reliance on current frameworks or for new contributions in this area".

Research papers are thus published which ‘pass each other like ships in the night’, without intersection, and with little reconciliation of research results. There are many examples of studies which investigated the same research topic, but whose findings are completely at variance with each other (cf. Jarvenpaa *et al*., 1985; Hiltz and Johnson, 1990). Hiltz and Johnson, in their study of user-satisfaction levels with information systems, reviewed the findings of twelve previous studies which sought to identify reliable variables that could predict user acceptance of information systems. They found widespread divergence of findings for almost all the variables studied, even where variables were clear-cut or trivial. However, further compounding the problem, there is the disturbing phenomenon whereby some researchers seem to actually strive to differentiate their work from that of others. Kraemer and Dutton (1991) cite several examples where researchers chose to ignore earlier work in their topic of study, or even coined new terms—probably the last thing the field needs—to differentiate their work from previous related research.

2.4 No Barriers to Entry

The contributions from related disciplines were necessary during the emergence of IS in order to import some foundational concepts, and thus, contributors

of this period may be characterised as 'guests'. However, by drawing concepts from these other disciplines, a bridge was created which researchers from these disciplines have readily crossed to work in the IS field. Interestingly, this bridge seems to operate unidirectionally as researchers from IS have not crossed it to work in other disciplines (cf. Keen, 1991; Vitalari, 1985), suggesting that barriers to entry may exist in other disciplines. However, it is our contention that some of the researchers from other disciplines contributing to IS may now be characterised more as 'invaders' than 'guests', as research which might not make as much impact in its original subject area is relocated to the IS field in which the results can appear more significant. These 'invaders' further hinder efforts in the IS field to establish first principles, as they blur the picture even more, multiplying the number of pseudo-findings and incrementing, without sufficient justification, the arsenal of methods and research protocols to be used in IS research.

Henderson (1970) suggest that both theory *and* practice are necessary to develop a competent understanding in a field. He uses an analogy with a physician, suggesting that three characteristics are necessary:

(a) An intimate habitual intuitive familiarity with things;

(b) A systematic knowledge of things;

(c) An effective way of thinking about things.

Henderson suggests that researchers are often exposed when they move outside their field to another discipline. However, that does not seem to occur with researchers writing under the IS banner. It is regrettably the case that (b) and (c) only apply in some research.

There is a clear need for research to be informed by characteristic (a) above, that is research which is practically relevant and useful. This has been a clarion call by many researchers (cf. Galliers, 1995; Nissen *et al.*, 1991). Our contention is that the opening of the field to other disciplines, which was undoubtedly helpful and necessary for the birth of IS, may now be out of control. Latour (1988) provided a number of striking examples of how the establishment of an intellectual core of first principles that require mastery before entry to a field is permitted, can cause a field to reach a position of dominance, whereas other fields which cannot achieve this will atrophy and disappear.

2.5 The Breadth of the Area

There is an essential tension between the sclerosis of an introspective field talking mainly to itself about itself, and the confusing dispersion of a field where all views, not all of which are helpful, contribute to the debate. Thus, the 'invasion' of the IS

field by researchers from a host of other disciplines has had certain negative consequences. For example, the enlarged scope of the area has caused the intellectual investment on the part of IS researchers to be very large, since familiarity is required with a multitude of potentially-relevant areas when researching any particular topic. However, influential researchers in the field have given counsel which has favoured this strategy. Dickson *et al*. (1982) have recommended that IS researchers should enlarge the scope of their reading to other support disciplines—the rationale being that this would improve their own research and also help avoid re-inventing the wheel by gaining access to accumulated knowledge in other sources. The logic of this strategy is certainly sound, but as it has been enacted in practice, it has raised more problems than it has solved.

One indication of the breadth of the area is the proliferation of journals relevant to IS research. This figure has in the past been estimated to be more than 150 (Bjorn-Andersen, 1985), whereas a more recent estimate puts the figure at a staggering 1,366 (Holsapple *et al*., 1993). This causes even further fragmentation of the field, which hampers the establishment of a cumulative tradition. The old adage that "if one wants to learn anything, one shouldn't try to learn everything" reflects the essential problem this poses for researchers. The intellectual investment required in becoming familiar with the potentially-relevant research in these related fields may thus be constraining productive research, as all exposed flanks have to be guarded—a problem which does not seem to arise to the same extent in other disciplines. For example, mathematicians do not have to continually prove that 1 + 1 = 2 (although they can) before they undertake any research. Relating this to the IS field, a particularly rich IS research area, that of Checkland's (1981) soft systems methodology (SSM), has been criticised on the grounds that it is flawed from both a philosophical and a sociological point of view (Biggam and Hogarth, 1994). This illustrates how IS research areas, even particularly influential ones such as SSM which has made significant contributions in the IS methodologies area, may leave certain flanks exposed which are then vulnerable to microscopic scrutiny. Thus, the breadth of the area contributes to the undesirable ‘mile-wide, inch-deep’ phenomenon, as researchers seek to cover every exposed flank rather than building cumulatively through intensive research on well-defined topics. Ironically, if IS is to become one of the primary organisational and management disciplines, it will need to cope with an even larger subject area. A possible strategy for dealing with this enlargement is proposed in the next section.

2.6 Reference Indiscipline

The term "reference discipline" was originally coined by Keen (1980) to refer to the need for intellectual honesty in respecting the standards of the field from which

concepts are drawn with a view to ensuring the soundness of research results. However, the term has since come to be used as synonymous with 'subject area'. A slightly different term may therefore be more appropriate to represent the serious phenomenon that Keen identified, namely, 'reference indiscipline', as it captures the essence of the problem.

This 'reference indiscipline' phenomenon has long been recognised in other disciplines also—a well-documented example being that of sociology (Blumer, 1940; Cicourel, 1964), and more recently, strategic management (Huff, 1990). The authors would argue that some of the research in the IS field has trivialised or misused the results of other fields. For example, there is much by way of spurious accuracy as frequency counts of isolated units of behaviour in psychological laboratories are taken to be relevant to real organisational situations. McGrath (1991), one of the foremost researchers on group behaviour, has expressed concerns with the limitations inherent in the findings of much of the group research which has been conducted. His primary concern is that most of the studies undertaken so far have focused on a limited range of types of ad hoc groups under controlled experimental conditions. As a result, McGrath has questioned whether such studies can accurately reflect the structures and processes of naturally-occurring groups as they exist in reality.

There is an additional danger in carefree borrowing from other disciplines, insofar as the discipline in question may change but the ramifications of such changes may not ripple through to all the other disciplines in which the results have been used. The mental models case which has been widely cited in the executive information systems area is an example of this. Most researchers cite a reference from 1983 (Johnson-Laird, 1983) when mentioning this phenomenon. However, research in the psychology field has questioned the use of the concept in other areas (Wilson & Rutherford, 1989); yet, IS researchers continue to refer to it, seemingly unaware that the field has been evolving in the interim. Our argument is that the IS field should not bind itself too tightly with other evolving disciplines; rather, to use a programming term, it needs to be loosely coupled to avoid problems due to changes in related fields.

2.7 IS Direction: Divergence rather than Convergence

Given that other disciplines have taken many decades to achieve solid conceptual foundations, the obvious argument is that the IS field simply requires more time to stabilise. Teng and Galletta (1991), in their survey of IS researchers' opinions, found that the average opinion could be exemplified by the following statement "the greatest problem is maturity (in the IS field) and direction...both will come with time". However, the same survey collected a large number of opinions of researchers who were concerned that the IS field was going in the wrong direction.

There has been a consistent failure among researchers to reach agreement on the fundamental nature of particular research areas, thus establishing divergent streams of research into essentially the same phenomenon, and thereby further inhibiting the establishment of a cumulative tradition. Researchers with different backgrounds argue for the primacy of their own recommended starting point. The evolving divergence of the IFIP WG8.1 CRIS conferences on systems development provides an example of this (Olle *et al.*, 1982; Olle *et al.*, 1983; Olle *et al.*, 1986; Olle *et al.*, 1988; Verrijn-Stuart & Olle, 1994). In 1982, the first conference (CRIS 1) attempted to ascertain what existed in terms of methodologies. It considered thirteen different development methodologies, mainly from academic research but considered fairly representative of commercially-available methodologies as well (Verrijn-Stuart, 1987). In order to facilitate comparison, it was decided that the methodologies should be applied to a standard case. Choosing a standard case posed a problem in that it needed to achieve a balance by being neither trivial, nor excessively complex. The case chosen was that of supporting an IFIP Working Group conference. However, the reactions to the case provide evidence of the wide gap in assumptions between different researchers. Some considered the problem statement to be so well-defined that it represented a complete requirements definition, while others considered it to be too ill-structured to form a basis for even the first design step (Verrijn-Stuart, 1987). Further evidence of the disparity in the assumptions of the researchers can be gained from the observation that the output designs from each methodology included in the CRIS 1 review are all very different, even though they addressed the same problem case. In 1994 (five conferences later), the search is no longer for convergence, but rather opts for the more pragmatic goal of seeking some kind of harmonisation among the vast number of currently-available development methods.

The above is not a criticism of the CRIS conference series—far from it. In fact, the various CRIS conference proceedings are widely cited by researchers in the development methods field, and the conference series itself is extremely well-regarded among the IFIP Working Group community. It is rather a rail against the diversity of the area which causes so much debate as to what can actually be agreed upon as the subject matter to be researched. In the case of the CRIS series, perhaps the acid test is that a system does not appear to have yet been developed which could actually support an IFIP Working Conference.

Interestingly, this trend towards divergence rather than convergence in the IS field has also been reported in two separate studies (Cheon *et* al., 1993; Culnan and Swanson, 1986) which involved a comprehensive analysis of the IS literature. However, the fact that the field is not moving towards convergence does not augur well for the establishment of the field as a discipline with its own unique identity.

3. An Agenda for Establishing the IS Discipline

Previous research which has focused on the emergence and evolution of disciplines has stressed the importance of establishing an intellectual core around which progressive institutionalisation and professionalisation take place (cf. Goldstein, 1984; Loft, 1987). The argument that the IS field will eventually achieve this if given enough time, similar to the emergence of different schools of psychology over several decades, can be proposed. However, as already mentioned, we would argue that the trend towards divergence rather than convergence in the field does not suggest that this is a likely outcome. Ultimately, it is not clear whether the volatile character of the boundaries of the IS field has positive or negative effects on IS research. Many researchers view the pluralistic flexibility of the IS field as a significant advantage (Cheon *et al*., 1993; Dickson *et al*., 1982), while Culnan and Swanson (1986) have identified the advantages, such as economies of communication among researchers, which would arise from the establishment of a stable IS discipline. However, not all fields have taken several decades to achieve a distinct identity. Loft (1987) discusses the evolution of cost accounting, from establishing a clear intellectual core, rapidly creating its own identity through the establishment of professional associations to eventual institutionalisation, all in the space of a few years.

The first step in solving a problem (the easiest, perhaps) is to acknowledge the existence and nature of the problem. This paper has outlined the nature of the problem. However, mere acknowledgement of the problem is not enough. The next step, therefore, is to determine the desirable state and its features and attributes. Many researchers have seen the solution in terms of deriving a specific paradigm for IS (Farhoomand, 1987; Van Gigch & Pipino, 1986; Weber, 1987). However, Banville and Landry (1989) present a number of powerful arguments which question whether such a paradigm is feasible, or, indeed, desirable. We argue that the overall solution for the future of the IS field involves more than the existence of a specific paradigm. We draw on the work of a number of researchers involved in research about the current status and future progress of the field, and also draw on salutary lessons from other fields (Bacon, 1996; Banville and Landry, 1989; Culnan, 1986, 1987; Davis, 1992; Galliers, 1995; Goldstein, 1984; Huber, 1983; Iivari, 1989; Ives *et al.*, 1980; Latour, 1988; Loft, 1987; Mumford *et al.*, 1985; Nissen *et al.*, 1991; Whitley, 1984) to propose a multi-faceted strategy highlighting potential directions for the IS field in the form of an agenda for establishing IS as a discipline.

3.1 Enable Natural Clustering of the Field

Ironically, fragmentation of the field, initially at any rate, may be a step towards eventual stability as a discipline. Compartmentalisation of the IS field into natural clusters would allow individual clusters to use the others as buffers in their relationships with neighbouring fields, thereby enabling researchers to raise a core of first principles much faster within smaller clusters of research. This does not preclude the healthy diversity of focus which prevents intellectual in-breeding. However, such a division of labour within the IS field, whereby each individual researcher does not have to cover all angles of research, but can concentrate fully on the most important aspects of research in a single cluster, or closely-related clusters, would help the IS field to achieve a strong and distinct identity (cf. Granovetter, 1973; Nohria, 1992). Also, to borrow some useful concepts from structured programming, these clusters should exhibit a high degree of cohesion (that is working on clear well-defined problems) and a low degree of coupling (that is passing just the required degree of well-established results between clusters). These latter concepts have parallels in the notion of functional dependence and strategic interdependence as proposed by Banville and Landry (1989). A good basis for progress in this direction seems to be the derivation of a taxonomy for the field, along the lines proposed by Bacon (1996), for example. This argument is strengthened by the existence of numerous examples in the history of science when the emergence of such taxonomies provided the basis for the establishment or the development of new disciplines. For example, Linnaeus' *Systema Naturae* is famous for having provided a much needed foundation for all the disciplines related to the study of living organisms (Trinkaus and Shipman; 1993).

3.2 Establish Intellectual Core and Fundamental Questions within Clusters

The establishment of an intellectual core of first principles would give the IS field a base of valid findings which could be transferred to other disciplines. Thus, the bridge between IS and other disciplines would become bi-directional as researchers could come into the IS field to conduct research, but within the established protocols of the field, while IS findings could be transferred to contribute meaningfully to other disciplines. This has parallels with Lakatos' (1970) concept of creating core theories and protective belt theories. He suggests that core theories represent the unquestioned assumptions which all researchers adhere to, while the protective belt represents those theories which are subjected to research. Thus, in the proposed scenario here, clusters would establish core concepts and fundamental questions. The relative independence of clusters would act as a protective belt as the questioning of concepts could be more specifically targeted and more localised. Also, given that the focus on fundamental questions has been instrumental in the evolution the behavioural and social sciences into disciplines (Patton, 1990), a similar focus is required in the IS

field. This would have immediate benefits in that it would help each cluster to establish a cohesive identity, but it would also help ultimately in efforts to establish a cumulative tradition in the IS field.

3.3 Professionalisation of the Field

The establishment of a strong intellectual basis and academic presence is not the only condition for the long term credibility of a field. IS must also define itself in terms of its praxis and its relationships with political, social and legal forces. Lessons can be learned from the case of cost accountants who became the legal guardians of corporate finance (cf. Loft, 1987). Evidence of moves in this direction are the professional association initiatives which have recently been put in place in the field (cf. Galliers, 1995). This professionalisation of the field would also contribute to raising barriers to entry in IS, thereby preventing the 'invaders' mentioned in section 2.4 above from hijacking IS research topics. Also, in a business context, it would help IS practitioners to stake a strong claim on the emerging organisational issues they quite reasonably regard as their own. Thus, the role and contribution of IS to the management of organisations can become more institutionalised.

3.4 Conclusion

We contend that the tripartite agenda put forward above would help IS researchers to address the fundamental problems in the field. Firstly, a compartmentalisation into clusters which could establish an intellectual core of first principles for each cluster would help to solve the identity crisis. Professionalisation would also help institutionalise IS which would allow it to carve out its own identity. Also, each cluster could conduct research which builds on a cumulative tradition within the cluster and prepare for an orderly communication and sharing of proven research findings between neighbouring clusters and areas of research. Additionally, the intellectual core of first principles would in effect create barriers to entry as researchers would have to be familiar with these principles if they were to write in the field. The raising of barriers to entry and the clustering into coherent research groups would also help cope with the breadth of the area. Also, the establishment of a similar core of first principles in related clusters would help alleviate problems of reference indiscipline as research results are more thoroughly validated before being published in the research domain.

Given the danger of possible usurpation of the research issues in the IS field by more established disciplines, it is imperative that a research agenda which would help progress towards a stable and mature discipline becomes a reality. However, a

problem may arise through the inertia of the many IS researchers who, content or complacent with the current situation in the field, would adopt an Augustinian outlook on this issue, that is, maturity, but not yet.

References

Ahituv, N, and Neumann, S. (1990) *Principles of Information Systems for Management*, Wm. Brown Publishers, USA.

Bacon, C. (1996) Working paper.

Banville, C. and Landry, M. (1989) Can the field of MIS be disciplined?, *Communications of the ACM*, **32**, 1, 48-60.

Bariff, M. and Ginzberg, M. (1982) MIS and the behavioral sciences: research patterns and prescriptions, *Data Base*, **14**, 1, 19-26.

Biggam, J. and Hogarth, A. (1994), Soft systems methodology (SSM): fundamental issues, in Wood-Harper *et al*. (eds), *Proceedings of Second Conference on Information Systems Methodologies*, University of Warwick, 249-255.

Bjorn-Andersen, N. (1985) Conference review: IS--a doubtful science?, in Mumford, E., Hirschheim, R., Fitzgerald, G. and Wood-Harper, A. (Eds) (1985) *Research Methods in Information Systems*, Elsevier Publishers, North Holland, 273-277.

Blumer, H (1940) The problem of the concept in social psychology, *American Journal of Sociology*, March, 707-719.

Boland, R and Hirschheim, R. (eds.) *Critical Issues in Information Systems Research*, John Wiley and Sons, Chichester.

Bunge, M. and Ardila, R.(1987) *The Philosophy of Psychology*, Springer, New York.

Checkland, P. (1981) *Systems Thinking, Systems Practice*, Wiley, Chichester.

Checkland, P. (1994) Notes on teaching and researching IS, *Systemist* (IS Special Edition Part II), **16**, 1, 6-8.

Cheon, M., Grover, V. and Sabherwal, R. (1993) The evolution of empirical research in IS: a study in IS maturity, *Information & Management*, **24**, 3, 107-119.

Cicourel, A. (1964) *Method and Measurement in Sociology*, Glencoe Free Press, New York.

Culnan, M. (1986) The intellectual structure of management information systems, 1972-1982: a co-citation analysis, *Management Science*, **32**, 2, 156-172.

Culnan, M. (1987) Mapping the intellectual structure of MIS, 1980-1985: a co-citation analysis, *MIS Quarterly*, **11**, 3, 341-353.

Culnan, M. and Swanson, E. (1986) Research in management information systems, 1980-1984: points of work and reference, *MIS Quarterly*, September 1986, 289-301.

Davis, G. (1974) *Management Information Systems,* McGraw-Hill, Singapore.

Davis, G. (1992) An individual and group strategy for research in Information Systems, chap 12 in *Information Systems Research: Issues, Methods and Practical Guidelines*, Robert Galliers (Ed.), Blackwell Scientific Publications, Information Systems Series, 1992.

Dickson, G, Benbasat, I, and King, W. (1982) The management information systems area: problems, challenges, and opportunities, *Data Base*, **14**, 1, 7-12.

Farhoomand, A. (1987) Scientific progress of management information systems, *Data Base*, **18**(3), 48-56.

Finnegan, P. (1991) *Information Systems Planning: An Empirical Study*, Unpublished Master's Thesis, University College Galway.

Galliers, R. (1995) A manifesto for information management research, *British Journal of Management*, **6**, (forthcoming).

Goldstein (1984) Foucault among the sociologists: the disciplines and history of the professions, *History and Theory*, 170-192.

Gould, S. (1986) The pandora's thumb of technology, *Natural History*, **96**, 1.

Granovetter, M. (1973) The strength of weak ties, *American Journal of Sociology*, **78**, 1360-1380.

Heany, D. (1965) Is TIMS talking to itself? *Management Science*, **12**, 4, 146-155.

Hearnshaw, L. (1987) *The Shaping of Modern Psychology*, Routledge and Kegan Paul, London.

Henderson, L. (1970) *On the Social System*, University of Chicago Press, Chicago.

Hicks, J. (1993) *Management Information Systems: A User Perspective*, West Publishing Co., USA.

Hiltz, S. and Johnson, K. (1990) User satisfaction with Computer Mediated Communication Systems, *Management Science*, **36**, 6, 739-765.

Holsapple, C., Johnson, L., Manakyan, H. and Tanner, J. (1993) A citation analysis of business computing research journals, *Information & Management*, **25**, 5, 231-244.

Huber, G.P. (1983) Cognitive styles as a basis for MIS and DSS designs: much ado about nothing, *Management Science*, 29, 5, 567-579.

Huff, A. (ed.) (1990) *Mapping Strategic Thought*, Wiley & Sons, Chichester.

Iivari, J. (1989) Levels of abstraction as a conceptual framework for an information system, in Falkenberg, E., and Lindgreen, P. (Eds.) (1989) *Information Systems Concepts: An In-Depth Analysis*, Elsevier Science Publishers, North Holland, 323-352.

Ives, B., Hamilton, S. and Davis, G. (1980) A framework for research in computer-based management information systems, *Management Science*, **26**, 9, 910-934.

Jarvenpaa, S., Dickson, G. and DeSanctis, G. (1985) Methodological issues in experimental IS research: experiences and recommendations, *MIS Quarterly*, **9**, 2, 141-156.

Jayaratna, N. (1994) *Understanding and Evaluating Methodologies*, McGraw-Hill, London

Johnson-Laird, P. (1983) *Mental Models*, Harvard University Press, Cambridge.

Keen, P. (1980) MIS research: reference discipline and a cumulative tradition, in McLean, E. (ed.) *Proceedings of the First Conference on Information Systems*, Philadelphia, 9-18.

Keen, P. (1991) Keynote address: relevance and rigor in information systems research, in Nissen, H., Klein, H. and Hirschheim, R. (eds) (1991) *Information Systems Research: Contemporary Approaches and Emergent Traditions*, Elsevier Publishers, North Holland, 27-49.

Kendall, P. (1992) *Introduction to Systems Analysis and Design--A Structured Approach*, Wm. Brown Publishers, USA.

Kendall, K. and Kriebel, C. (1982) Contributions of the management sciences to the evolution of management information systems, *Data Base*, **14**, 1, 13-18.

Kenneron, W. (1970) MIS universe, *Data Management*, September.

Kraemer, K. and Dutton, W. (1991) Survey research on information systems, in Kraemer, K. (ed) *The Information Systems Research Challenge: Survey Research Methods*, Vol. 3, Publishing Division, Harvard Business School, Boston, 3-57.

Kriebel, C. and Moore, J. (1982) Economics and management information systems, *Data Base*, **14**, 1, 30-40.

Lakatos, I. (1970) *Criticisms of the Growth of Knowledge*, Cambridge University Press, Cambridge.

Latour, B. (1988) *The Pasteurisation of France*, Harvard University Press, Cambridge, Massachusetts.

Loft, A. (1986) Towards a critical understanding of accounting: the case of cost accounting in the UK, 1914-1925, *Accounting, Organizations and Society*, **11**, 2, 137-169.

McGrath, J. (1991) Time, interaction and performance (TIP), a theory of groups, *Small Group Research*, **22**, 2, 147-174.

Mumford, E., Hirschheim, R., Fitzgerald, G. and Wood-Harper, A. (Eds) (1985) *Research Methods in Information Systems*, Elsevier Publishers, North Holland.

Naumann, J. (1986) The role of frameworks in MIS research, *Proceeding of the 1986 DSI National Meeting*, Honolulu, Hawaii, 569-571

Nissen, H., Klein, H. and Hirschheim, R. (eds) (1991) *Information Systems Research: Contemporary Approaches and Emergent Traditions*, Elsevier Publishers, North Holland.

Nohria N. (1992) Introduction: is a network perspective a useful way to studying organisations, in Nitin Nohria and Robert Eccles (Eds.) *Networks and Organisations: Structure Form and Action*, Harvard Business School Press, Boston Mass.

Nolan, R. and Wetherbe, J. (1980) Toward a comprehensive framework for MIS research, *MIS Quarterly*, **4**,2, 1-19.

O'Brien, J. (1993) *Management Information Systems: A Managerial End User Perspective (2nd Ed.)*, Irwin, Boston.

Olle, T., Sol, H. and Verrijn-Stuart, A. (1982) *Information Systems Design Methodologies: A Comparative Review*, North-Holland.

Olle, T., Sol, H. and Tully, C. (1983) *Information Systems Design Methodologies: A Feature Analysis*, North-Holland.

Olle, T., Sol, H. and Verrijn-Stuart, A. (1986) *Information Systems Design Methodologies: Improving the Practice*, North-Holland.

Olle, T., Verrijn-Stuart, A. and Bhabuta, L. (1988) *Computerized Assistance During the Information Life Cycle*, North Holland.

Paller, A. and Laska, R. (1990) *The EIS Book*. Business One Irwin, Homewood, Illinois.

Patton, M. (1990) *Qualitative Evaluation and Research Methods* (2nd Edition), Sage Publications, London.

Reynolds,G. (1988) *Information Systems for Managers*, West Publishing Co., USA.

Stamper, R. (1973) *Information in Business and Administrative Systems*, Wiley, New York.

Stamper, R. (1993) Applied semiotics, Invited paper to the ICL/University of Newcastle seminar on "Information", September 1993.

Stein, A. (1995) Help Needed: IS Department under Threat, ISWorld List Discussion.

Teng, J. and Galletta, D. (1991) MIS research directions: a survey of researchers' views, *Database* Winter/Spring 1991, 53-62.

Trinkaus, E. and Shipman, P. (1993) *The Neanderthals - Changing the Image of Mankind*, Pimlico, London.

Van Gigch, J.P. and Pipino, L.L. (1986) In search of a paradigm for the discipline of information systems, *Future Computer Systems*, 1(1), 71-97.

Verrijn-Stuart, A. (1987) Themes and trends in information systems: TC8, 1975-1985, *The Computer Journal*, **30**, 2, 97-109.

Verrijn-Stuart, A. and Olle, T. (Eds.) (1994) *Methods and Associated Tools for the Information Systems Life Cycle*, IFIP Conference Proceedings, North Holland.

Vitalari, N. (1985) The need for longitudinal designs in the study of computing environments, in Mumford, E., Hirschheim, R., Fitzgerald, G. and Wood-Harper, A. (Eds) (1985) *Research Methods in Information Systems*, Elsevier Publishers, North Holland, 243-265.

Weber, R. (1987) Towards a theory of artifacts: a paradigmatic base for information systems research, *Journal of Information Systems*, **1**, 2, 3-19.

Whitley, R. (1984) *The Intellectual and Social Organisation of the Sciences*, Clarendon, Press, Oxford.

Wilson, J. and Rutherford, A. (1989) Mental models: theory and application in human factors, *Human Factors*, B31B, 6, 617-634.