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December 2006

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Recommended Citation

Hassan, Nik, "Is Information Systems a Discipline? A Foucauldian and Toulminian Analysis" (2006). *ICIS 2006 Proceedings*. 29.
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IS INFORMATION SYSTEMS A DISCIPLINE? A FOUCAULDIAN AND TOULMINIAN ANALYSIS

Epistemological and Philosophical Issues in Information Systems

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Abstract

Based on Michel Foucault's description of how knowledge is created and Stephen Toulmin's philosophy of human understanding, this essay uncovers what it means for a branch of knowledge to be a discipline. This deconstruction explains certain disciplinary misconceptions existing within the IS field and addresses the field's disciplinary status. Although the findings suggest that the IS field does not yet qualify as a discipline in its own right, they show that as soon as the members of the IS field can reconstitute the field's meta-theoretical structure and scholarly content, it is certainly capable of reaching that status.

Keywords: Philosophical foundations of IS, IS discipline, IS theory, disciplinary status, archeology of knowledge, Foucault, Toulmin

Introduction

In recent years, evidence is emerging questioning the disciplinary status of information systems (IS). For example, Keen (1991, p. 27) does not consider IS an academic discipline ("Information Systems Research is a self-defined community, not a field or discipline") because he finds nothing in IS, in terms of topics, theory, or methodology that is unique. Stowell and Mingers (1997) find problems accepting IS as a discipline and consider it an emerging one. Other authors consider IS as a weaker form of a discipline because: (1) IS does not have a common perspective and few distinctive characteristics (Jones, 1997), (2) the process of knowledge construction is sociologically weak with a high level of task uncertainty coupled with lack of mutual dependence between researchers (Banville and Landry, 1989), and (3) "its focus, methods, norms, language and standards" are problematic (Checkland and Holwell, 1998, p. 34). For all these reasons, these authors consider IS at best an emerging field, not a discipline in its own right. All of these issues have triggered a series of debates on what constitutes the "core set of properties" of the IS field (Alter, 2003; Galliers, 2003; Gray, 2003; Hirschheim and Klein, 2003). These findings are also consistent with the modest impact IS has over other fields (Wade et al., 2006).

These findings are examined using Michel Foucault's *Archeology of Knowledge* and Stephen Toulmin's philosophy of human understanding, two philosophies that describe how knowledge evolves and how intellectual disciplines are established. The goal of this analysis is to provide an alternative deconstruction for the legitimacy and "disciplinarity" of the IS field, and using this deconstruction, to answer both the questions, "Is information systems a discipline?" and the same time, "How can IS become a discipline?" Building upon Hassan and Will's (2006) analysis that found IS to have a unique subject matter, this study proposes several ways how the unique subject matter of IS can become a legitimate discipline.

Why Should IS Strive to Become a Discipline?

Several authors question the need for IS to become a discipline or for IS to have a unique subject matter. Banville and Landry (1989) recommend against disciplining IS because doing so will transform the multidisciplinary IS field into a monistic and restrictive field. Myers (2003) contends that the IS field is not yet ready to define its core

primarily because IS scholars cannot yet agree on its fundamental concepts. As Hassan and Hart (2006) argue, there is a critical difference between the *disciplinary subject matter* of the IS field and its *internal content*. For example, the internal content of the discipline of economics has changed dramatically since it was originally defined by Steuart (1767) in the mid-eighteenth century. Although economics has produced many new concepts that often contradict earlier findings, the “core” of economics — the rules governing human needs and wants and how these ends are met — has not changed. As Kuhn (1970, p. 161) notes:

It may, for example, be significant that economists argue less about whether their field is a science than do practitioners of other fields of social science. Is that because economists know what science is? Or is it rather economics about which they agree?

Scholars of economics agree on the nature of their field as well as what they do as economists, yet such a consensus does not mean they have to agree on all areas of study, techniques, or methods; rather, the core or disciplinary subject matter forms the foundation for its coherency and cogency that earn the respect of other disciplines. It is this *disciplinary subject matter* that needs to be clear not only to all of the members of the IS field but also to members of other disciplines interested in IS. It is this *disciplinary subject matter* that represents the “core” of the field that distinguishes IS from other disciplines. The need for this “core” and ultimately for IS to become a discipline can be justified by internal reasons as well as by reasons coming from outside the field:

Internal Reasons

Internally, fields of study benefit immensely from the coherency that disciplinary activity offers. A branch of knowledge cannot remain multidisciplinary for too long, and must attain the status of an “interdiscipline” in order to maintain its internal coherency (Hassan and Will, 2006). By fulfilling certain conditions, referring to a specific range of objects of study, using certain instruments and techniques, and fitting into certain theoretical models, a certain proposition is said to belong to a specific discipline (Foucault, 1972). Far from limiting the study, disciplines provide the guidelines within which discourse and knowledge can grow and still remain coherent and relevant to its name. With the help of these guidelines disciplines recognize true or false propositions, old or novel approaches, and mainstream or peripheral categories (Messer-Davidow et al., 1993). Researchers within a discipline have clear directions as to what will contribute to the maturity of their discipline, pitfalls to avoid, and novel sub-areas to study. As the result of disciplinary work, members of the discipline can recognize what does and does not qualify as disciplinary knowledge. This self-validating disciplinary practice contributes to its cogency and legitimacy (Preziosi, 1993).

This internal coherency creates rare “treasures” that are valuable to its members and other stakeholders. The value of these treasures lies in the rarity and usefulness of the statements and discourse that forms the basis for that discipline. For example, researchers in finance value the concept of the time value of money because it forms the basis for much of their work. From such treasures, a discipline typically generates a burgeoning archive of writings, articles and publications that compete for attention. This voluminous archive of knowledge becomes possible because the discipline is able to find meanings in its rare and valuable “statements.” These rare “statements” form the principles of the discipline, are often appropriated by other disciplines, and are repeated, reproduced, and transformed into the voluminous collection and archive of that discipline. These “statements” belong to the discourse upon which the discipline is built, and it is this discourse that enables the discipline to create new ideas, make new inventions, solve problems, and explain phenomena. Such disciplinary activity is not possible without the internal coherency offered by these discourses. The discourses become the inexhaustible treasure for the members of the discipline. Traditionally the field of IS has depended on the treasures of other disciplines, specifically the organization sciences. The field of IS needs to find its own rare treasures because if it does not, it will continue to struggle with issues of relevance and prestige.

External Reasons

Disciplines, by definition, imply that their content is rigorous and legitimate by others outside the discipline (Shumway and Messer-Davidow, 1991). Non-disciplinary fields do not attain the same level of rigor and legitimacy as disciplinary fields. During the early beginnings of modern Western knowledge, this rigor and legitimacy was commonly derived from the scholar or *author-figure* of that field (Foucault, 1972). The *author-figure* made certain propositions significant, and became a measure of their truthfulness. Since the seventeenth century, this function has been steadily declining and is being replaced by “disciplines” within which the totality of their propositions is

considered to be true. This disciplinary support is established by whole strata of practices such as teaching and pedagogy, publishing, libraries, learned societies, associations, and laboratories. Regardless of the field of knowledge, whether it is within the natural sciences or the administrative and management sciences, the status of that field's knowledge is measured by the power of its disciplinary institutions.

The transfer of this legitimacy from the *author-figure* to disciplinary institutions can be seen in the development of classical Western philosophy. Before the thirteenth century, knowledge was divided into the classical division of philosophy (logic, ethics, physics) and the categories of subjects studied in monasteries during that period: trivium (grammar, rhetoric, dialectic) and quadrivium (arithmetic, geometry, astronomy, and music). This monastic system remained in place until, during the seventeenth and eighteenth centuries, academic institutions began competing for the rights of producing knowledge, proclaiming themselves as open-minded seekers of the truth, in opposition to theological and religious institutions. This struggle for dominance resulted in the break up of "natural philosophy" into the specialized subjects of physics, biology, and chemistry in the eighteenth century, and later resulted in the emergence of the social sciences from moral philosophy (Kristeller, 1951). By the nineteenth century, "discipline" was synonymous with "divisions of knowledge," and took the physical form of university departments within the oldest universities in Europe and United States. The university gave academics a kind of "cognitive exclusiveness" over their area of study. As an historian of research universities noted, "A discipline is, above all, a community based on inquiry and centered on competent investigators. It consists of individuals who associate in order to facilitate intercommunications, and to establish some degree of authority over the standards of their inquiry" (Geiger, 1986, p. 29). Fields of study that wish to claim legitimacy have little choice but to qualify as a discipline.

In addition to legitimacy, real-life social and business practices derive their authority from disciplinary work. This authority forms the basis for the relevance of that discipline to real-life practices. For example, the formal authority of the Penal Code is derived from sociological, psychological, medical, and psychiatric knowledge based in academic practice. The Penal Code came into existence because it became possible to categorize different crimes by matching the severity of the crime to the length of prison time. The study of criminology, the unifying discipline behind the Penal Code, derived its legitimacy by the relations it built among sociological, psychological, medical, and psychiatric knowledge (Foucault, 1972). In the natural sciences, the power and authority, and consequent impact and influence of disciplines such as physics, biology, and chemistry, is reflected in the industrial and chemical revolutions and modern clinical practice. In the social sciences, the Hawthorne experiments and Taylor's writings exemplified the influence that academic discourse exerted on business practices. The legal structure of accounting underpins the relevance of the discipline to real-life practices.

The IS field should strive to become a discipline because the legitimacy, authority, relevancy, internal coherency, and rarity build recognition from other disciplines and the world at large. Internally the members of the IS field recognize who they are professionally and what they do so that they can chart their research directions. Externally the IS field will be able to clearly describe their area of study to others so that they can find areas of common interest and potential cross-disciplinary research. Ultimately these disciplinary activities invite due recognition in the form of funding, power, membership, and other resources. These forms of legitimacy are what the IS field desperately needs to acquire.

The Seven Myths of Disciplinarity in Information Systems

Before embarking on the deconstruction of the IS field, several misconceptions of the term "discipline" in the literature need to be clarified:

A Field is a Discipline

IS authors often assume that fields of study are disciplines. Banville and Landry (1989, p. 48) note that "[I]ndeed, members of any scientific field, and particularly those belonging to fields struggling for recognition such as MIS, have to worry about the social and scientific status of their discipline." Here "field" and "discipline" are used synonymously. There seems to be an unquestioned assumption that IS as a field is indeed a discipline (Galliers, 2003). As long as a group of people is engaged in a discourse on a subject or branch of knowledge, that branch of knowledge can qualify as a field of study, but the discourse does not make it a discipline. Toulmin (1972) describes a spectrum of activities, on one extreme, "compact" (p. 378) fields that qualify as disciplines and on the other, "non-disciplinable" activities that cannot qualify as disciplines. Between the two extremes lie the numerous "rational

enterprises” that are close to becoming disciplines (“would-be-disciplines”) or “quasi-disciplines.” For example, according to Toulmin, physics qualifies as a compact discipline, whereas the human sciences qualify as either “would-be-disciplines” or “quasi-disciplines,” while the subject of ethics, because of its individualistic and multi-valued nature, is more likely non-disciplinable. A group of people may consider it worthwhile to study ethics, but it is unlikely that such a group will agree in any significant manner so as to justify establishing a discipline. Such a group can study the *field of ethics* but cannot coalesce into the *discipline of ethics*.

A Field or Discipline Is a Science

Disciplines are often equated as sciences. Banville and Landry (1989) consider IS a science because universities offer IS programs at both the undergraduate and graduate levels, and the field holds prestigious conferences and has its own prestigious journals. However, the scientific status of IS is not all that clear (Khazanchi and Munkvold, 2000). Although it may be safe to say that a science is always a discipline, the reverse is not necessarily true. As Toulmin (1972) explains, certain activities are directed toward artistic, craftsmanship, technical, or legal ideals. Toulmin considers these professions “disciplined” because the members of the profession accept the collective ideals of the profession and strive to improve and perfect its procedures and techniques. Additionally, the apprentice to the profession needs to undergo extensive training and conditioning in order to demonstrate a grasp of the profession’s ideals, procedures, and techniques before becoming a member of the profession. On the other hand, many branches of knowledge, especially those in the liberal arts, are not sciences but are considered legitimate disciplines. Clinical medicine, with its own medical universities, professional associations, pedagogy, legal infrastructure, and scholars, is generally accepted as a legitimate discipline, but according to Foucault (1972; 1973), is not a science. That is why the medical discipline is struggling to enhance its practice by transforming it into a more “scientific” discipline using approaches such as evidence-based medicine (Guyatt et al., 1992). According to Churchman and Ackoff (1950), science is an inquiry that differs from other kinds of inquiry by virtue of what it inquires into, and how it inquires. Science is controlled inquiry. According to Popper (1959), an inquiry is a science as long as the theories in the inquiry can be falsified. Therefore, the arts and literature are not considered sciences because there is little control in the nature of their inquiry and their assertions cannot be tested or falsified. Similarly, clinical medicine is not a science because it is a mass of empirical observations, uncontrolled experiments and results, prescriptions, and institutional regulations that do not comply with any formal testing criteria (Foucault, 1972). However, as in the case of the arts and medicine, the fact that a branch of knowledge only qualifies as a discipline, but not as a science, does not in any way reduce its legitimacy or credibility.

A Discipline Has to Be a Single-Paradigm Field

Mainly caused by a particular interpretation of Kuhn’s concept of normal science and paradigm incommensurability, many authors, including IS authors, assume that a disciplined field is one that is governed by a single paradigm. For example, Chalmers (1998, p. 108) says that “[A] mature science is governed by a single paradigm.” Friedrichs (1970) argues that modern sociology is dominated by Parson’s (1949) version of the “system” paradigm, specifically functionalism. These authors, including Banville and Landry (1989), often repeat Masterman’s (1970) peculiar interpretation of Kuhn’s progress of science. Masterman (1970) interprets Kuhn’s concept of paradigm as one that “triumphs over the rest, so that advanced scientific work can set in, with only one total paradigm” (p. 74) or that “a total new science with one vast paradigm” is how disciplines are established. This view of a total dominating paradigm is rejected by Kuhn (1970) himself:

What has been said so far may have seemed to imply that normal science is a single monolithic and unified enterprise that must stand or fall with any one of its paradigms as well as with all of them together. But science is obviously seldom or never like that (p. 47).

Although Kuhn accepts the possibility of dominant paradigms, he also concedes that multiple paradigms can exist coextensively (“with all of them together”), and clearly admits that science, much less disciplines, is never a single paradigm or single grand theory activity.

A Discipline is Monistic

The singular-paradigm discipline characterization is often followed by the assumption that a discipline can only be monistic and not pluralistic (Banville and Landry, 1989). Consequently, what follows is that fields that are eclectic

or diverse can only progress if located somewhere between pluralism and monism. For example, IS authors have suggested that IS should be researched using a “disciplined methodological pluralism” (Landry and Banville, 1992). At what disciplinary level this compromise is to exist is not clear. Disciplinary activities exist at the (1) meta-theoretical (or paradigm level), (2) theoretical, and (3) methodological (research method and techniques) levels. The previous sub-section already explains how monism at the meta-theoretical level is misconceived. If the issue lies at the theoretical level, compared to monistic approaches, it is safe to say that pluralistic approaches are more likely to enrich a discipline (Klein et al., 1991; Lee, 1991). In other words, the presence of many theories explaining certain phenomena (e.g. inflation in the field of economics) is generally welcomed. If the issue lies at the methodological level, again, very few scholars will disagree that multiple methods of research are advantageous. Regardless of which levels of discussion are deployed for a field, monism or pluralism has little to do with a field’s disciplinary status.

The monistic or pluralistic character of a branch of knowledge is not a criterion for that branch of knowledge to qualify as a discipline. The meaning of monism or pluralism needs to be clarified. For example, politics can be considered monistic if political scientists seek a single explanation for political phenomena. Instead, a pluralistic political science would find explanations for political phenomena in diverse places. A discipline such as chemistry can be considered monistic because it subscribes to a natural way of classifying matter. In either discipline, the monistic or pluralistic nature of that discipline does not take away its disciplinary status.

A Pluralistic Field Needs to be Multi-Disciplinary

A common assumption appearing in the IS literature is that a pluralistic field needs to be multi-disciplinary in order to establish itself as a discipline. Stowell and Mingers (1997) propose that in order for IS to be established as a discipline, IS needs to be concerned with varied domains such as technology, information, mathematics, linguistics, semiotics, psychology, communications, and society. This assumption is rooted in the understanding of what constitutes a multi-disciplinary field. Many consider psychology and political science as multi-disciplinary because they accept different philosophies and explanations. They may have been multi-disciplinary in the beginning of their emergence in the eighteenth century, but today they are each unique disciplines in their own right. Both are among the oldest disciplines in Western civilization and find no need to be multi-disciplinary in order to establish themselves as legitimate disciplines.

An *inter-disciplinary field* is the result of a multi-disciplinary *effort* that combines participants from two or more already established disciplines for a particular goal or purpose. Whether or not such a *multi-disciplinary* effort will mature into an *inter-disciplinary* field is not a given (Hassan and Will, 2006). A multi-disciplinary effort can remain just that, an *effort*. And even if the effort is concluded, all the scholars working in that effort go back to their own disciplines. What transforms a multi-disciplinary field into a unique *inter-discipline*, as in the case of political science, is the ability of that field to synthesize all the discourses of the parent disciplines (Hassan and Will, 2006).

Kuhn’s Analysis of Scientific Progress Is Rationalistic and Not Sociological

Banville and Landry’s (1989) argument that the IS field cannot be and should not be disciplined is based on Whitley’s (1984) interpretations of Kuhn. First, following Whitley’s interpretation, they view Kuhn’s view of scientific progress as purely rationalistic. Whitley (1984) notes that “[T]he two [Kuhnian] assumptions of uniformity and inevitability in knowledge development in mature fields prevented social scientists from studying variations between the sciences and investigating the social conditions in which radical intellectual change will occur” (p. 3). Consequently, Banville and Landry (1989) conclude that such a deterministic and rationalistic view of science is unsuitable for the more pluralistic IS field because “it seems dubious that we could end up with a paradigm that could include the different approaches currently found in the MIS field” (p. 49-50) and following Whitley, “a field should be accepted for what it is” (p. 58). But as Hassan and Will (2006) argue, pluralism and diversity within a discipline’s content and approaches is *inherently disciplinary*. The argument for pluralism within the content of the IS field is moot. It is the meta-theoretical dimension, the *discursive formation* of the field that cannot be pluralistic.

There is nothing in Kuhn’s writings that suggests a monistic deterministic process at work in the development of knowledge. On the contrary, as an historian, Kuhn supports the view that scientific progress is historically contingent. And history has everything to do with social conditions and external environment. His whole thesis for writing *Structure* was based on the answering questions such as “When was oxygen discovered?” and “Who first

conceived of energy conservation” (p. 2), two very historically contingent questions. This is not to take anything away from the value of Whitley’s work in the sociology of science, only to state that his conclusions are *not inconsistent* with Kuhn’s paradigms.

Kuhn’s notion of paradigms and scientific revolutions describes not only the historical development but also the sociology of science and knowledge. There are numerous references to sociological concepts of conflict and the establishment of rules for interaction in *Structure*; in fact, the whole idea of revolutions is sociological and not totally rationalistic. Kuhn talks about membership in scientific communities, “study of paradigms...prepares the student for membership in the particular scientific community” (p. 11), but Kuhn also talks about *rules and standards of practice* that make up a discipline. Kuhn emphasizes the quality of the “[M]en whose research...are committed to the same rules and standards for scientific practice” (p. 11), and sociological forces acting on scientists such that in the beginning, “there was no standard set of methods or of phenomena that every optical writer felt forced to employ and explain” (p. 13). As the field matures, the members of the discipline adopt certain paradigms, not because certain individuals in the field overpower others, but as the result of the continuous collective work that all of them expend in order to progress the field.

A Field of Study that Has One Major or a Few Major Theories Has a Strong Theoretical Core

For the IS field to become a discipline, many authors suggest the field should subscribe to one or a few major theories instead of having many different theories. The implication of this statement is that a field that has many different theories lacks theoretical core and is therefore not a discipline. This assumption is probably born out of the notion that a single dominating paradigm controlling a discipline is capable of only a few major theories. Lyytinen and King (2004) show that such an assumption is unfounded. They cite examples of many disciplines, such as biology, that contain many different and often conflicting theories throughout their historical development, yet are considered legitimate disciplines.

The issue of disciplinarity is therefore not directly related to the scientific status of a field, the number of paradigms guiding the research in the field, the diversity in theoretical foundations and methods of research, or the multi-disciplinary content of the field. The disciplinarity of a field is concerned with its “disciplineness” — the possibility conditions for a discipline (Klein, 1990; Manicas, 1987; Messer-Davidow et al., 1993; Shumway and Messer-Davidow, 1991). In the next section, the origin of the term “discipline” sets the stage for the description of these possibility conditions as seen from the philosophies of Michel Foucault and Stephen Toulmin.

The Etymology of Disciplines

The etymology of the term “discipline” reveals its diverse connotations (Shumway and Messer-Davidow, 1991). Its Latin roots suggests that the word connotes a double sense of knowledge and power (e.g. monastic or military discipline). The Biblical Latin *disciplina* means “instruction given to a disciple,” and the term *discipulus*, means “pupil” (Hoskin and Macve, 1986). The online Dictionary of Etymology defines the sense of the word “discipline” as “order necessary for instruction,” and notes that the term was used as early as circa 1386 to mean “branch of instruction or education” (Harper, 2001). The Oxford English Dictionary notes that “discipline” could also come from the word *discipere* which means “to grasp intellectually, analyze thoroughly,” from *dis-* meaning, “apart” and *capere*, meaning “take.” All of these etymological senses of the word suggest training or mastery by the use of order and control.

Studies in disciplinarity (Hoskin and Macve, 1986; Klein, 1990; Shumway and Messer-Davidow, 1991) suggest that the word “discipline” was also used in its earliest forms to mean different areas of practice during the Middle Ages such as theology, medicine, and the arts. The modern connotation of the word “discipline” appeared during the nineteenth century and can be linked to the evolution of the modern natural sciences, the general “scientification” of knowledge, the industrial revolution, technological achievements, agrarian developments, and the growth of the universities (Flexner, 1979). In the beginning, disciplines emerged as social institutions to meet social and public needs. Disciplines as a concept and as institutions exist to produce knowledge, and strive to assure that the knowledge they produce is justified and reliable (Hackhausen, 1972; Preziosi, 1993). Etymologically disciplines therefore have a positive connotation of mastery and reliability.

Hackhausen (1972, p. 83) defines a discipline as “the specialized scientific exploration of a given homogenous subject matter producing new knowledge and making obsolete old knowledge. Disciplinary activity results

incessantly in formulations and reformulations of the *present* body of knowledge about that subject matter.” This definition is consistent with Foucault’s (1972, p. 223) characterization of a discipline as something “which is required for the construction of new statements. For a discipline to exist, there must be the possibility of formulating – and of doing so ad infinitum – fresh propositions.” This etymological analysis of disciplines is therefore consistent with Toulmin’s (1972) definition for disciplines as communal activities geared to accomplishing an agreed upon set of ideals and Foucault’s *archeological analysis* of disciplines as producers of knowledge.

The study of disciplinarity as an historical form is a recent phenomenon (Shumway and Messer-Davidow, 1991). In 1989, the Group for Research in Institutionalization and Professionalization of Literary Studies (GRIP) organized a conference at the University of Minnesota titled “Disciplinarity: Formations, Rhetoric and Histories.” The conference acknowledged that Foucault (1972) was the first to describe a discipline as “a system of control in the production of discourse” (p. 224), the result of the Renaissance “will to truth,” and “the kind of division governing our will to knowledge” (p. 218). Stephen Toulmin, more famous for his work on rhetorical arguments, was also a historian of science, and was one of the earliest to write on the logic behind the formation of disciplinary institutions (which he terms “the rational enterprise”). These two philosophers offer novel views on the possibility conditions for the emergence of academic disciplines.

Toulmin’s Academic Discipline

Toulmin (1972) approaches the emergence of the academic discipline from the view of its intellectual authority. Intellectual authority lies with scholars who “understand what properly belongs to their respective disciplines and their continued existence through time” (p. 145). This recognition is predicated on recognizing what Foucault (1972) terms as the *discourse* of their discipline. Hence, economists recognize their discourse as economic discourse, physicists recognize their discourse as physics discourse and so on. As Hassan and Will (2006) explain, different characters of discourse (*positivities*) may exist within a field of study, but they all obey the same *rules of discourse* pertaining to their respective fields, displaying the characteristic familiarity that cuts across different topics within a field. What then demarcates a field or subject of study from a discipline? Like Foucault (1972), Toulmin (1972) rejects the idea that theories, concepts, or conceptual systems characterize the unity of any particular discipline. Toulmin focuses on the succession of concepts and continuous relations that legitimize the genealogy of ideas within the discipline. Essentially Toulmin supports Hassan and Will’s (2006) notion of a “disciplinary subject matter” and Foucault’s “discursive formation” that distinguish one field of study from another. This “professional attitude[s]” (p. 150) by which the activities of the field are guided is realized as a “collective ideal” and “communal goal” that solves the common problems of the field (p. 151). Toulmin’s first criterion for disciplinarity is therefore the existence of “fundamental ideals” (p. 153) that exist beyond any specific period of time and are not owned by any particular scholar.

Hence, the study of nuclear physics is not owned only by Ernest Rutherford, the “father of nuclear physics,” at the turn of the twentieth century, but also by Thomson before that and Bohm in the 1940s and 1950s. Bohm himself contributed to the field of neuropsychology, another discipline quite distinct from theoretical physics. This demonstrates how concepts and theories can be shared among disparate disciplines. Does the field of IS have such “fundamental ideals?” Based on evidence provided by Hassan and Will (2006), the field does indeed hold to “a collective ideal” and “communal goal” that addresses some common problems distinct from computer science, management, or any other related discipline. Discourses that address questions on how businesses can harness the power of computers, how organizations can persuade their employees to use computers, how organizations should plan the implementation of applications, how the benefits of computers should be evaluated and presented in an understandable form to those paying for it, all characterize the new ideals for IS in the early 1950s. Today, similar problems continue to be discussed in IS journals and conferences, demonstrating that such communal goals traverse any specific period of time.

The second criterion for disciplinarity according to Toulmin (1972) is what he calls “its current repertory of concepts and explanatory procedures” (p. 175) that are consistent with the “communal goals” required by the first criterion. All fields of study go through the beginning stages of not knowing much about the phenomena of interest, even an uncertainty about its intellectual goals. Typically the phenomena being studied produces a lot of information — in the case of IS, IS failures, success, adoption and acceptance, cognition, decision making — that the members of the field have a problem “what to make out of it” (p. 155). Consequently, ideas are refined, concepts are constructed, and empirical methods, procedures and structures are tested, all toward clarifying and explaining the phenomena of interest. These collective concepts of the discipline are what an apprentice of that

discipline needs to get “caught on to” (p. 159) before being admitted as a member of such a discipline. Typically such collective concepts are found in the discipline’s classic textbooks that “expound the body of accepted theory, [and] illustrate many or all of its successful applications” (Kuhn, 1970, p. 10). Fields of study that do not yet own such concepts and explanatory procedures, and merely borrow from other disciplines, do not qualify as disciplines in their own right. This criterion does not imply that fields of study cannot borrow from other disciplines, only that such borrowing should result in the creation and development of concepts they can claim as their own (Hassan and Will, 2006). In the IS field, borrowing is currently a de facto method of legitimization. IS researchers continue to appropriate theories, especially from the organization science disciplines. What needs to take place in the IS field is the construction and development of endogenous concepts and theories from these borrowed concepts, not more borrowing and testing of these concepts in the IS field. This lack of autochthonous development is the reason why the IS field has not substantially contributed to other fields (Nerur et al., 2006; Wade et al., 2006).

Toulmin’s (1972) final criterion for a field to become a discipline is its “isolable and self-defining nature” (p. 360). This isolable and self-defining nature of the discipline is analogous to the ecology of the organic environment. Although the ecology is essentially an isolable self-sustaining system, it will not survive without inputs from its external environment. Similarly, Toulmin compares intellectual disciplines to the same complex and reciprocal systems that exist in the organic environment, describing disciplines as the “intellectual ecology” (p. 300). This intellectual ecology defines a clear boundary between what is “internal” to the discipline and what is “external.” Internally the concepts and procedures of the discipline can be expected to change and evolve as the result of the efforts of its scholars as well as the inputs from external scholars. Notwithstanding such porous boundaries, the members of the discipline are able to distinguish what constitutes knowledge from their discipline as opposed to that from other fields. Hassan and Will (2006) explain how the lack of boundaries around the IS field create a certain lack of loyalty among the members of the field, and make it difficult for the field to reach organizational and *intellectual critical mass*. Additionally, the influence of numerous other fields encroaching into the IS field increases the *burden of comprehension* for its members.

Foucault’s Academic Discipline

At about the same time Toulmin was writing *Human Understanding*, Michel Foucault was working on his method of analyzing the transformations taking place in historical knowledge. He calls this method the *Archeology of Knowledge*, the findings of which are very consistent with Toulmin’s work. Foucault (1972) describes two thresholds that academic fields undergo in their development: (1) the *threshold of positivity* — when a discourse is formed from a single system of formation and, (2) the *threshold of epistemologization* — when the discourse claims to validate norms of verification and coherence, and exercises a dominant function over knowledge. Hassan and Will (2006) have shown how the IS field has passed the threshold of positivity and is therefore built upon a single system of formation. This section infers that a field qualifies as a discipline as it passes Foucault’s threshold of epistemologization.

Coherence within the Discourse

According to Foucault, the bases of a discipline are the unique discourses that distinguish the essential activity of a discipline from another discipline. When a field is able to stand on its own and is distinguishable from other disciplines, that field of study has reached the “threshold of positivity.” By definition, therefore, the unique discourses characterizing a discipline imply that a discipline is also unique. Uniqueness is necessary but not a sufficient criterion for the field to qualify as a discipline. The first criterion that qualifies a discourse to become a discipline is the level of coherence that the discourse demonstrates. In order for a field to formulate, ad infinitum, fresh propositions, it needs to produce coherent concepts.

Coherent concepts in a discourse are made up of statements that depend on and logically connote other statements. These statements describe the relations between certain objects of study with other objects of study. These statements and concepts are considered coherent when they have three characteristics (Foucault, 1972, p. 56-63): They are (1) Ordered, (2) Considered Valid, and (3) Translatable

The Ordering of the Statements and Concepts

Concepts in a discourse become coherent when they can be arranged in an ordered schema based on some inferential or descriptive order, succession, generalization, or progression that the discourse is subject to. For example, natural history did not just create knowledge by giving new meanings to words like “genus” or “character”, or by creating new terms like “animal classification” or “mammal.” The study of natural history arranged these terms based on a set of rules into a coherent schema. This kind of order of statements and concepts is what the IS field needs to develop within its internal content. This order is not just a mere classification of terms. For example, in the case before natural history, the study of living beings was essentially based on historical accounts, whether fact or fable, of living beings. Whereas in order for the new concepts of natural history to appear, all the historical accounts were replaced by a meticulous examination of those same living beings, stripped of all fabulous and mythical commentaries. The ordering used by natural history depended on four variables – the form of the living beings and its parts, the quantity of those elements, their configuration in relation to one another, and the relative sizes of each element – all falling within the new concept within natural history called *structure* (Foucault, 1972).

The historical development of IS knowledge did not reflect this ordering of statements and concepts until at least a decade after the emergence of IS as a positivity (Hassan and Will, 2006). Churchman’s (1971) recasting of Western epistemological theories into organizational learning and information processing terms was probably one of the earliest evidences of IS using existing concepts in new ways and creating new ordered objects and concepts. Another example of an enduring classification in IS is Gorry and Scott Morton’s (1971) ordering of decision making into new structured and unstructured decision making concepts. Both of these new concepts were incorporated into Mason and Mitroff’s (1973) schema in which more new objects — mode of presentation — were introduced. Since these two seminal works, very little ordering of statements and concepts is forthcoming from the IS field.

The Concepts Are Considered Valid

Concepts in discourse are coherent when they are perceived as valid. For example, statements and concepts of early natural history were validated either by observing or analogously confirming with various validating structures such as contemporary cosmology, philosophy, theology, and even biblical exegesis. With this new-found validity, it became possible to discuss the truth value of any natural history proposition. This type of coherence creates a “field of presence” (Foucault, 1972, p. 57) that is accepted by other researchers as true or at least well-founded. Often these concepts have a “field of concomitance” (p. 58) because they are analogously supported by observations from other objects, concepts, or discourses. Of course, not all of these concepts survive. Many are later invalidated and are deleted to the “field of memory” (p. 58), the series of concepts that are no longer discussed or carry any validity but nevertheless form part of the evolution and development of knowledge.

Cognitive style research in IS experienced these phases of validation. Cognitive style research was predicated on the validity of the relationship between the psychological type of the decision maker and decision making effectiveness. In the beginning, the validity of this relationship was accepted by other IS authors. Because it was acknowledged to be well-founded, cognitive style research created a field of presence that was accepted as true by other researchers. The success of psychological typing in practices such as career counseling and job placement provided the “field of concomitance” for the validity of such a relationship. However, further evidence and subsequent research in cognitive style (Huber, 1983) showed that the validity between psychological type and decision making effectiveness was at best questionable. Consequently, the series of statements and concepts of cognitive style fell into IS’s “field of memory,” and could not carry future IS research. Other early IS concepts such as “decision support” encountered a more promising development. Early decision support systems (DSS) research proposed how DSS could improve management decision making (Scott Morton, 1967), suggested how to design a DSS (Gerrity, 1971), and suggested how organizations could take advantage of DSS (Keen and Scott Morton, 1978). The field of presence for DSS research expanded with its continued use in organizations (Alter, 1980) and later its transformation into different kinds of systems.

The Concepts Are Translatable

In addition to the ordering of the concepts and statements, and its assumed validity, the coherency of the concepts is also reflected by what Foucault (1972) calls *procedures of intervention* (p. 58). These procedures include the rewriting, translating, and transcribing of the concepts and statements into different forms (e.g. from qualitative into

quantitative, from more to less formalized, from objective to subjective, from tables to figures) or into other discourses (from vegetal character to animal taxonomy, or from superficial into internal character). The ability to perform this translation enhances the communicative nature of the concepts, refines their exactitude, circumscribes the domain of validity of the concepts, and systemizes the propositions, all of which increases the coherency of the statements and concepts.

Several procedures of intervention used by natural historians remain in use today. For example, Tournefort¹ (1694, pp. 1-2) was one of the earliest to relate the character of an element to its name. Later Linnaeus (1737) developed the famous binomial naming system. This unique language described the table of species the object belonged to and the possible variations that might be derived, enabling the discipline to not only designate all natural entities precisely within a *structure*, but also to describe their *character* in relation to each other (their scientific names). Both the concepts of structure and character, and their inherent coherency, qualified natural history to its threshold of epistemologization.

In the social and organizational sciences, many examples of translation between fields took place to define new concepts. For example, the study of the social group based on social mechanics and physics (Carey's Principles of Social Science by applying laws of gravitation, centralization, and decentralization), Herbert Spencer's ideas applying biological concepts to sociology (organic structure), and the study of the social group as a distinct psychological entity, with its own "collective mind" (Churchman and Ackoff, 1950) are examples of the procedures of intervention applied by social scientists. Mason and Mitroff's (1973) framework for research in IS is an example of rewriting and translating both psychological and organizational concepts into a new language for IS. Also, Rockart's (1988) application of DSS principles in the realm of the practice of top executive support demonstrates how concepts in one domain are transformed and used in other domains. These examples show how coherent concepts in IS add to the field's disciplinary status.

The Formation of "Themes" or "Theories" within a Discourse

The existence of coherent statements and concepts in a discourse enables the field to develop theories. Foucault (1972) describes this activity of choosing a specific set of concepts for theory building as the "the formation of strategies" (p. 64) within the discourse. A discourse makes a choice in terms of strategies to reconstruct and simplify the overwhelmingly complex reality of its subject matter. By doing so, the discourse can understand, explain, and predict phenomena and events involving the object of study. Sometimes more than one strategy can exist at any one time.

Within a chosen strategy, the combination of certain objects and concepts achieve a level of coherence they would not be able to achieve using any other strategies. When the level of formality is low within a certain strategy, Foucault refers to this choice as a "theme" (p. 64), whereas when its level of formality is high, it becomes a "theory" (p. 64). So in biology, in order to understand and better explain the sudden gaps in the taxonomic table of living beings, an evolutionary *theme* was deployed. This new strategy offered an alternative explanation to the vitalist or mechanistic themes that existed at that time within the discourse of biology. Similarly, in physics, Huygen's wave theory of light existed at the same time as Newton's corpuscular wave theory of light but in the beginning, was unable to exert its influence because of Newton's clout within the discourse of physics.

The combination of coherency and theory development in a discourse imposes a certain control over how the discourse treats any proposition or collection of concepts. Based on a discourse's *autochthonous* techniques or methods, a proposition or collection of concepts fulfills a set of onerous and complex conditions before it can be admitted as disciplinary knowledge. Every member of that discourse is burdened with these requirements, and they need to acquire some level of competency before they can engage in any discourse within the discipline. This level of competency controls the boundaries surrounding the discipline such that any attempt to create any statements within a discourse will require that it fulfills the conditions of considerable prior technical training before it can be considered as part of that discipline.

For example, Koontz (1980) expressed concern when members from other disciplines such as anthropology and political science started entering the field of management. Although highly trained in their own fields, Koontz

¹ "The idea of the character that essentially distinguishes plants from one another ought invariably to be one with the name of each plant."

feared they might misunderstand management principles and theories, and seek to promote the narrow views of their own specialties. They might know very little of the actual task of managing and the realities that practicing managers face, and might be unable to or unwilling to understand others. This “theory jungle” might get worse as more disciplines infiltrate management and create a situation where the customers and beneficiaries of the management discipline can no longer benefit from the teachings of this more complex multifaceted version of management.

The control exerted by the combination of coherency and theory development in the discipline is not repressive in any way. It instead forces the discourse to innovate and invent objects, concepts, and techniques that enrich it. For example, Mendel’s theories of heredity were rejected by his colleagues because existing biological discourse did not have the necessary techniques, methods, or knowledge relations that allowed for his theories of heredity to be judged on their merits. Essentially the control that existing biology scholars exercised over the field forced Mendel to innovate. In order to build a new set of complex rules that would admit new disciplinary knowledge into an existing discipline, he had to invent and create new methods and techniques that were different from the ones belonging to existing discourses in biology. In other words, Mendel’s propositions became false to other researchers in the beginning because they lacked the necessary coherency. Discourses that have a coherent network of knowledge relations in the form of their own methods of measurement, techniques of comparing what is true or false, will be more likely to attain disciplinary status.

Certain authors in IS, in trying to consolidate the field despite its lack of theory, argue that theory development (“theoretical core”) is not a necessary condition for the legitimacy of IS. They posit that certain “counter-examples” of established and legitimate fields such as the classics, German literature, accounting, history (Lyytinen and King, 2004), and English (King and Lyytinen, 2004) also demonstrate lack of any theoretic core. An examination of these claims is instructive. The classics can be traced back to history, perhaps the oldest discipline dating back to the ancient Greeks. In order to carry out the study of history, the discipline has developed its own philosophy and theories to guide its scholars. For example, Oswald Spengler’s (1926) and Arnold Toynbee’s (1947) theories suggest that history is cyclical and not linear; that history is not concerned with the movements of nations, states, races, or events, but of “high cultures” with their own distinguishing features; that these high cultures are “living” things that must pass through the stages of birth-development-fulfillment-decay-death. The classics is a special kind of historical discipline combining the disciplines of Greek and Latin literature, philosophy, art and archaeology, philology, and linguistics in order to study great or “classic” achievements of Graeco-Roman and surrounding civilizations (Kristeller, 1955). Two major scholars who systemized the discipline of the classics were the art historian and archeologist J. J. Winkelmann (1717-68), and his follower philologist F.A. Wolf (1759-1824), who coined the theory of *Altertumswissenschaft* (antiquity science). Their theories and approaches improved the study of the classics over earlier British approaches (Pfeiffer, 1976).

Two other examples of established disciplines that apparently lack theories are German literature and English. These disciplines may not be sciences, but they both were developed on the solid, pre-conceptual schemata and theoretical bases common to all language studies. English, for example, teaches the arts of interpretation, analysis, critical understanding, and communication. Each of these contributing disciplines is based on established theories. Foucault (1972) defines four pre-conceptual schemata that define English and other languages – attribution, articulation, designation, and derivation. These schemata contain coherent rules as to how the verb succeeds the noun, and how the adjective succeeds the earlier two elements, and how these elements in the original language survive in subsequent transformations of that language. Using these theories, linguists theorize that Basque, Coptic, and Native American languages are closest to Chinese because they use separable elements as a means of connecting syllables and words. Celtic is similar to Arabic and Aramaic because they are all inflectional languages. The theories that manipulate the concepts of these disciplines provide invaluable insights to the domain of knowledge they represent. The lack of theory development in IS remains a major impediment toward it reaching the status of a discipline. As with other established disciplines, the field of IS needs to undergo a similar process of building themes and theories in order to qualify as a discipline.

Clear Identity and Genealogical Boundaries

Genealogical boundaries circumscribe the “kind” of areas that discourses within a discipline belong to, areas within which the discourse performs its fundamental activity and produces a distinct identity. Such boundary work assists members of a discipline in becoming more effective when studying its objects and concepts. Boundary work also helps other disciplines recognize and appreciate the content and fundamental activity of a certain discipline. Each

discourse is formed from a different system of formation. However, certain discourses have similar objects and concepts that form the same foundation for a collection of discourses. These foundation objects and concepts relate a discourse to other discourses, or allow a discourse to be categorized together with other similar discourses. Based on this nature of discourses, it is possible to trace theories and concepts from one discourse to other discourses because similar objects and concepts from one discourse are manipulated in another. This group of discourses containing similar objects and concepts form a genealogical boundary. The formation of these boundaries builds what Foucault (1972, p. 61) calls the “domain of normativity” for the branch of knowledge such that it is possible to exclude other statements from that discourse as being inessential or marginal.

Genealogical boundaries are formed either as a result of (1) a discourse emerging from original statements that mature into a discipline, (2) a new discourse emerging from a parent discourse, or (3) several different discourses together maturing into a discipline. A discourse is capable of developing from original statements and later maturing into a discipline. Most of the disciplines that develop this way are early disciplines such as history, psychology, physics, natural history, and political economy. A new discourse can also emerge from existing discourses and create its own boundaries. Such a discontinuous event occurs when the system of formation of a discourse creates new statements that can no longer be placed in the same field as existing statements. Because of the historical growth of knowledge, most of the newer disciplines, such as political science, biology, modern economics, and accounting, form genealogical boundaries as a result of emerging from parent discourses, or from several different discourses integrating and emerging into disciplines. New discourses develop their own goals, get supported by their own authorities, and develop their own distinct identities from their parent disciplines.

Such was the case with the discipline of modern political science that extracted itself from the discipline of history and was able to develop into a cogent discipline by the end of the eighteenth century (Manicas, 1987). As political scientists began *politicizing* history, new objects and concepts that were totally distinct from those of history started emerging. Whether or not these branches of knowledge become disciplines in their own right depends on how well they build boundaries to separate themselves from their parent disciplines. The new discipline of finance, for example, has also managed to separate itself from its parent, economics; however, finance retains a very close relationship with economics because many of the objects and concepts between the two disciplines did not change as a result of that separation.

Many branches of knowledge that don't have clear genealogical boundaries remain either as orphaned branches of knowledge, not belonging to any discipline, or merely as areas of interests or “methods” within established disciplines. For example, general systems theory as a branch of knowledge does not have any clear boundaries and is easily appropriated by any discipline or other branches of knowledge. Although several attempts were made to define and identify what this area of study is about (Boulding, 1956), it remains nebulous and orphaned despite the value it provides to other disciplines. Operations research as a branch of knowledge did not lack a goal or influential authorities; however, it began to drift and today can comfortably find its home in any discipline including management science, information systems, transportation, or engineering (Corbett and van Wassenhoff, 1993; Fildes and Ranyard, 1997). The field of IS suffers from the same lack of boundaries that several of its contributing fields such as operations research suffers from. For example, at the practical level, very little prior qualifications are required for entrance into an MBA program specializing in IS (Galleta, 2006).

Concluding Remarks: How Can IS Qualify as a Discipline

As with any other field of knowledge, the path for IS toward becoming a discipline in its own right is fraught with complex issues and problems. These issues range from developing its internal content or body of knowledge to improving its internal sociological processes and adapting to external forces that shape its direction. This analysis of the IS field highlights several steps that can be taken to qualify IS as a discipline:

Articulate the Unique Concepts and Discourses Belonging to IS

The disciplinary subject matter that distinguishes the IS field from other fields needs to be articulated clearly to all stakeholders. What is the IS field about? In cross-disciplinary research, in what areas can IS contribute? In the same way that psychology has articulated its discourses in human mental processes, behavior, and attitudes and defined concepts such as consciousness, perception, memory, and learning, IS scholars need to agree on a set of positivities (characters of discourse) and concepts that represent IS. Only then can the IS field begin to develop

strategies, themes, and theories that it can say are its own, instead of corroborating theories that belong to other disciplines.

Focus on the Development of Theory

The development of theory can begin as soon as IS concepts achieve an acceptable level of coherence and validity, especially from the point of view of other disciplines. As this occurs, the IS field will be ready to choose the strategies that reconstruct and simplify the overwhelmingly complex reality of its subject matter. Not all of these concepts will succeed, but at least the IS field can claim them as its own. The few concepts and theories that demonstrate validity will become reference theories for other disciplines, and will contribute toward enhancing the legitimacy of the IS field. By doing so, not only will the IS field be able to explain and predict phenomena and events involving the plurality of objects that it is studying, other disciplines will be able to better relate to IS research and its contributions.

Erect Disciplinary Boundaries

The combination of coherency and theory development in a discourse imposes a certain control over how the discourse treats any proposition or a collection of concepts. All members of that discourse is burdened with these requirements, and they need to acquire some level of competency before they can engage in any discourse within the discipline. This level of competency represents the boundaries surrounding the discipline such that any attempt to create any statements within a discourse will require that it fulfills the conditions of considerable prior technical training before it can be considered as part of that discipline. This type of coherency maintains the rules of formation of statements for that discourse and controls the circumstances in which the members of the discipline display their expertise. The existence of these boundaries adds to the field's credibility and objectivity.

Strengthen Relationships with Non-Discursive Practices

The conclusive evidence that a field has reached the status of a discipline is its close relationship with non-discursive (or real-life) practices. The perceived importance of the non-discursive practice of a discipline reflects the reward given to the members of that discipline. For example, medical doctors are among the highest paid professionals in America. The public tolerates this economic hierarchy because without basic health, all other activities become impossible (Ihde, 1993). If taking care of IT remains a critical concern of businesses or social life, the discipline surrounding IT will remain at the top of the scale. Analogously, the closer the discursive (or academic) practices are to real-life practices (non-discursive practices), the more likely the discourse will be acknowledged as a discipline. In addition to this economic reality, disciplines are characterized by more than the need to fulfill a current real-life demand. Discourses that have a closer relationship with real-life practices will be more productive and effective in becoming self-generating. Foucault (1972) calls this relationship the ability of a discourse to build "a domain of actuality" (p. 61) such that it is used in real-life practices in solving problems, or in some form that exercises the functions or truths it contains.

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