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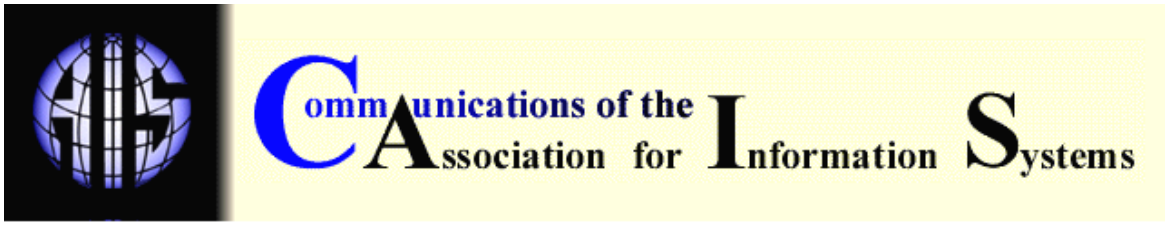

IT/IS MANAGEMENT AND RESEARCH DIRECTIONS

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ABSTRACT

The author spent much of the years prior to January 2000 as an international consultant for Y2K issues. During this period, a very large quantity of quantitative and qualitative data has been collected, together with many one-to-one interviews with very prominent IT leaders in business. This data led to extensive empirical research concerning the "real ills" of the IT/IS industry, with fascinating results. The phenomenology we have seen, in tens of installations, each with hundreds of millions of lines of code (or more) have shown the breadth of gap between academic research and "real world" business Information Technology / Information Systems. This paper attempts to point out part of this large gap and hopefully, shows some reasons for its continued existence. This paper is intended to trigger wider interest in IT / IS research.

I. ISSUE

IT/IS is not an exact science. It is much more an "engineering discipline" than a "natural science." As such, there are no "natural laws" to be discovered, no clear, non-controversial directions for research, and no "absolute" or "critical" things to be discovered. Perhaps, the *critical* things are parts of other disciplines. The issue is then whether IT/IS research is relevant or even, if it is a "legitimate" academic area of activity.

II. DEFINITION OF RELEVANCE

As used here, *relevant* refers to "relevant" (to someone), "serves interest" (of someone) and/or an idea of "*useful to someone*" (though not construed to mean useful to someone's "publish or perish" budget). The assumption being that relevance is sufficiently shown if any of these conditions exist. An additional issue may be raised as to research "*significance*", which may be independent of relevance. Significance would depend upon existence of a result, while relevance may exist prior to (or independent of) a result. Remembering that a hypothesis proven false is also a significant research result – though there is an issue as to how to publish this result because no one likes to admit something an apparent failure. The final *degree* would then be "applicable." However, one must be very careful, as research may seem non-applicable when performed but find a very important application at some late time. Certainly, engineering is full of many brilliant examples of such time delays. We see then, that there are degrees of "relevance" all germane to this discussion. "Relevant" is an *attribute* of research.

III. A BASIS FOR RELEVANCE

Regardless of the eventual significance of a specific research result, for research to possess any degree of relevance the research must have some degree of currency. That is, research cannot be considered relevant if the subject of the research is already well known and adds nothing new

to human knowledge. A basic concept of any research is that it does not duplicate or circumvent established knowledge, but somehow adds to existing knowledge. We shall call this second *attribute* of research "legitimacy."

IV. A TAXONOMICAL VIEW

What *precisely* is meant by IT/IS? Using these words as a term, one is in danger of seeing only the concept and not the larger issue. Information Technology is technological solutions for dealing with information (acquiring, managing, storing and disseminating). Information Systems are actual implementations of these technological tools. Information Technology is then, perhaps the most inter-disciplinary of all fields of human activity because all activities are information based.

The short history of IT has been amazingly successful. Information Systems are pervasive. Many technologies matured (to varying degrees) and the world is clearly a better place. Hundreds of billions of dollars are spent yearly on Information Systems. Millions of highly skilled professionals, based on practically every landmass on the globe, are active. Nations compete for IS business. Yet, the discipline still lacks a paradigm to manage created assets [Ben-Menachem and Gelbard 2001] - with the Y2K fiasco (a management, not technological fiasco) as perhaps the strongest testament to this lack.

In most cases, when this author has attempted to discuss Software Asset Management with professionals, either their eyes glazed over or they thought I referred to Configuration Management. What other area of human endeavour spends hundreds of billions of dollars, with essentially no management? It must be understood that I do not present the management issue as an example of an issue. It, itself, is very central. The questions of IT/IS relevance cannot be addressed if management is viewed trivially.

V. RESEARCH AREAS

Separate structures exist in academia for Computer Science, Electrical Engineering, Library Science, Ergonomics, Industrial Management and more. Are these "legacy structures" doomed to eventual phase-out or is this separation as desirable as that between (say) chemistry and chemical engineering? The answer lies in the larger issue of where the basis of IT/IS is - information or computing, a fundamental issue, not to be decided lightly.

Are research efforts performed in industry of lesser value than those performed by academia? This question is legitimate question, as industrial development is less rigorous than academic research. Whether the answer is positive or not, what should be the attitude of academia to these efforts, after-the-fact?

Example 1: "Software Process Improvement" (SPI) efforts are widespread – CMM/CMMI [Paulk et al., 1993; Fowler and Rifkin, 1990], SPICE / ISO15504 (produced by the International Software Engineering Standards Committee, through the Process Assessment Working Group, ISO/IEC JTC1/SC7/WG10, as a nine-part document) [Dorline,alec et al., 1995] and more. SPI efforts, extensively applied in major organisations of all types and sizes, rely on effective integration of technological, managerial, methodological and organisational solutions. This imperative becomes increasingly obvious as professionals attempt to deal with conflicting challenges of complexity, quality, and competitiveness. Where and how, should these concepts be studied?

Many prominent professionals try to view IT/IS research as a study of e-commerce systems. Yet, processes used to create these e-systems do not differ significantly from those for many other types of systems. SPI can itself be considerably improved by using Information Technology. A Distributed Asynchronous Group Support System (e-something) can play a major role in improvement efforts. *Corporate Learning* is a major objective.

Example 2: Industry developed far-reaching concepts of peer-to-peer paradigms such as, Napster and GNUTELLA, Notes, and Groove. Where and how, should these concepts be studied?

VI. CONCLUSION

The issue raised attempts to ask if IT/IS research is relevant. I believe the question is badly phrased.

- First, the terminology of the concept of "IT/IS research" needs to be much better defined. At present, the borders between IS/IT and other disciplines are vague. What really constitutes IS/IT research is an open question. IT/IS is not biology where what is and is not known, is clear.
- Second, the general discipline, as well as its place in academia, needs to be defined. One of the most prominent of research efforts in this area is Lehman's FEAST project [Lehman and Belady, 1985; Lehman et al. 2000].
- Finally, no discipline can be well defined until its management structure is well understood. No Civil or Chemical Engineer would dream of developing systems with hundreds of millions of dollars in expenses and devoid of a management structure to control the assets.

Is Information Technology and Information Systems research relevant? It will be when we know what we are, who we are and where we are trying to go.

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Part 2: A model for process management

Part 3: Rating processes

Part 4: Guide to conducting assessment

Part 5: Construction, selection and use of assessment instruments and

Tools

Part 6: Qualification and training of assessors

Part 7: Guide for use in process improvement

Part 8: Guide for use in determining supplier process capability

Part 9: Vocabulary

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Mordechai Ben-Menachem is Adjunct Lecturer in the Information Systems Engineering Department, Ben-Gurion University, Israel. He has been active in all areas of Software Engineering and Software Quality over three decades. He is active in ACM, I-SPIN, IPA and IEEE and with international standards and standardization activities through the Software Engineering Technical Committee, since 1979. His activities included participation in balloting, commenting, and writing International Software Engineering standards. Mr. Ben-Menachem is the author of fourteen professional books and six books of literature and philosophy and edited two others. He is the author of some three hundred-fifty professional papers in both English and Hebrew. Mr. Ben-Menachem's specialities are in Software Assets Management and evaluating, implementing and planning software quality and process improvement programs, with emphasis on Software Maintenance.

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