

# SOME OBSERVATIONS ON INFORMATION SYSTEMS AS AN ACADEMIC DISCIPLINE

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*ABSTRACT: Personal observations on the state of information systems research and their implications on the future of information systems education are offered in this paper.*

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## INTRODUCTION

Is information systems an academic discipline? This question is being raised by CIS educators at national meetings, by deans and academic vice-presidents in their strategic planning sessions, and by our colleagues in the corridors of most institutions.

You can endlessly debate this question at the philosophical level. The reality is that there are graduate and undergraduate programs in information systems, there are research journals in information systems, and scores of meeting, workshops, and conferences on information systems topics and issues are held each year. As CIS educators we can argue that these are concrete evidence of a thriving academic discipline.

Instead of asking whether information systems is an academic discipline, we should inquire why do we and our colleagues in other disciplines question the validity of information systems as an academic discipline? Let me begin by offering a few anecdotes that may shed some light on this.

The dean at one college has observed that if he asks two CIS professors to explain what is information systems, he invariably gets three answers.

At the Northeast Decision Sciences Institute (DSI) meeting last spring I served

on a panel entitled "Information Systems as a Discipline: Promises and Controversies". The panel consisted of five CIS educators from five different universities. A person in the audience asked the names of the home departments of the panelists. It turned out that no two names of the departments offering CIS programs were same.

Last week I received a flyer about the IFIP (International Federation for Information Processing) WG8.2 Workshop to be held in Copenhagen next December. The first paragraph of the workshop theme and purpose reads as follows.

"Whereas work with classical information systems research methods (such as laboratory experiments, surveys, case studies, etc.) continues, many new research approaches have emerged based on different theoretical foundations. The Manchester Symposium (September 1984), for example, documented that phenomenology, contextualism, trade union perspective and critical social theory have influenced recent research projects. Some of these do not meet customary standards of rigor and validity. This raises serious concern in the research community and others affected by the continuing deployment of information technology."

In this issue of *CIS Educator*, the EDSIG president, Bob Wysocki, alludes to a "new" crisis in information systems education which he describes as the widening gap

between the demand and supply of CIS professionals. He correctly points out the two factors that are influencing this gap, namely, that freshmen interest in CIS has been declining for the past four years and the use of computing in organizations has expanded dramatically during this period. His message to us, the CIS educators, is a question: How should we respond to this crisis?

I feel that the widening gap between the demand and supply of CIS professionals is an old problem in a new garb. Ten years ago, information systems programs were erupting in colleges all over this country to address the same crisis situation which was described as the gap between the demand and supply of CIS professionals. The main difference between these two situations is that ten years ago freshmen interest in CIS was growing and there was a shortage of qualified faculty. Today we find that freshmen interest in CIS has been declining for the past four years and the shortage of qualified faculty issue is replaced by what qualifications are needed to teach information systems and do research that extends the theory and practice of the field and meets academic research standards.

Although the declining enrollment issue could be explained away as a marketing problem or the natural market cycle, it is a major problem for the discipline and it needs to be addressed by the CIS community both locally and nationally.

The faculty qualification question is more fundamental because it touches the core of the information systems discipline and it will determine the future of information systems as an academic field.

My hypothesis is that leading universities that grant Ph.D. degrees in information systems have failed us. I will offer a few observations that suggest that information systems is a discipline in crisis.

### OBSERVATION 1

The ACM recommendations [1] for graduate professional programs in information systems proposed an intellectual basis for information systems education by identifying areas that should underlie any curriculum in the field. The areas identified are:

- o Computer Systems Concepts
- o Program, Data, and File Structures
- o Data Management
- o Data Communications and Networking
- o Information Systems in Organizations
- o Information Analysis
- o Systems Design
- o Decision Systems
- o Information Systems Policy

These nine areas were identified as the core knowledge areas of an information systems professional. Every department that offers this curriculum needs faculty to teach these areas. If we define the field by the expertise of the faculty needed to teach it, then these nine areas can be viewed as the components of information systems as an academic discipline.

Defining a field of study by identifying its components may not be aesthetically pleasing or scientifically valid, yet it is pragmatic and useful. I feel that since the above nine areas have passed the time endurance test, they are expected to remain as the central part of the information systems field.

It should be mentioned that academic programs in a field of study like information systems are influenced and molded by market forces, technological innovations, and professional competencies. But information systems as an academic field will grow and mature solely through scholarly research in the field.

### OBSERVATION 2

Mr. Ralph Sanford [2], a graduate student in our M.S. program, performed a content analysis of the all the articles published in the *MIS Quarterly* in 1986 and 1987. One of the objectives of this study was to determine what proportions of the articles

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are in each of the nine areas of the information systems field. His research showed that only 15% of the articles addressed the four technology oriented areas and 85% were in the systems and policy areas. The exact distribution is shown in Table 1.

Extrapolating from Mr. Sanford's findings, we can hypothesize that MIS research is somewhat skewed in the sense that very little research is done to further the knowledge and practice of the technology component of the information systems field.

### OBSERVATION 3

Vogel and Wetherbe [3] studied the methods used in MIS research by leading publishing schools. Their findings are summarized in table 2. One can extrapolate from their findings to hypothesize that information systems research is dominated by the social science paradigm of research, and published MIS research is based on the expertise of the empirical research process rather than the domain knowledge of the discipline.

### IMPLICATIONS OF THESE OBSERVATIONS

Experience has shown that process dominant research may generate breadth of knowledge but it rarely generates depth in the field. Some observers feel that without sufficient depth, an academic discipline cannot flourish. The reasons suggested are:

- o It would not provide the challenge to attract gifted students to the discipline.
- o It would not be respected by our colleagues in other disciplines.
- o People in the field will lack professional satisfaction and security in the sense that long years of research experience in the field provides little edge over newcomers.

If any component of a field is not continuously enriched and infused with conscious research, it will eventually cease to be a part of this field. The technology portion of the information systems field has the potential of dying in the sense that it will be taught by "second class" faculty or it will be subcontracted to computer science.

### SOME RECOMMENDATIONS

1. Institutions offering Ph.D. programs in information systems must ensure that their doctoral students possess a thorough grounding in all the nine areas of the information systems field. It is the responsibility of doctoral granting institutions to prepare new faculty who can teach courses in any of the nine areas of the information systems field.
2. Doctoral granting institutions should expand their research agenda in information systems so that research is conducted in most

of nine areas of the information systems field. This will require introducing doctoral students in CIS to design- oriented research paradigms used in software engineering research and artificial intelligence research.

3. Research in the field should contribute toward generating depth in the field.
4. CIS programs should prepare students for a profession, and a profession requires cultivating specialized expertise rather than general knowledge.

## CONCLUSION

Until the changes recommended above are incorporated in the programs and research agendas of doctoral granting institutions, CIS departments will need faculty with terminal degrees in other computer disciplines to teach the core knowledge of information systems and do research in areas of information systems that are ignored by our leading research universities. My advice to the deans is that they should get used to the idea of getting three different opinions on CIS issues from most pairs of CIS professors.

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## ABOUT THE AUTHOR

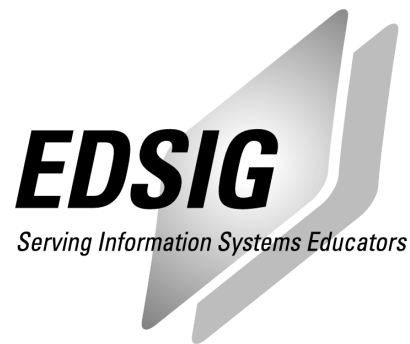
Donald R. Chand is currently a Professor of Computer Information Systems and Chairperson of the Computer Information Systems Department at Bentley College. He received his PhD from Boston University, his MSc from Dehli University, and his BS from St. Stephen's College. He has taught at Boston University and Georgia State University in Atlanta. His teaching and research interests are in application development technology which includes design methodologies and artificial intelligence techniques. Dr. Chand has conducted ACM and IEEE tutorials and seminars on program design methodologies, fourth generation languages and expert systems. He has also authored numerous articles in the areas of programming methodology, design of algorithms, 4GLs and decision support systems. Additionally, Dr. Chand has been the principal speaker at many professional meetings.

**Table 1**

	1986	1987	Total	%
Computer Systems Concepts	2	2	4	7
Program, Data, and File Structures	0	0	0	0
Data Management	1	1	2	4
Data Communications and Networking	0	2	2	4
<b>Total for Technology areas</b>			<b>8</b>	<b>15</b>
Information Systems in Orgs.	4	5	9	15
Information Analysis	4	2	6	10
Systems Design	2	4	6	10
Decision Systems	4	5	9	15
<b>Total for System areas</b>				<b>50</b>
Information Systems Policy	6	6	12	21
Systems development projects	3	5	8	14
<b>Total</b>				<b>35</b>

**Table 2**

Methods in MIS Research	%
Subj/Argument	15.5
Theorem Proof	4.5
Engineering	3.0
Case Study	20.3
Survey	36.3
Experiment	9.0
Field Test	11.4



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