

# Teaching Information Systems Today: The Convergence Between IS and Organization Theory

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## **Abstract**

*The panel has two objectives: The first one is to explore the idea of "convergence" between Information Systems and Organization Theory in IS courses at different levels. This idea, that is actually just a conjecture, was naturally born analysing IS curricula models evolution over time in comparison with Organization Theory evolution. This issue will be presented in the first part of the panel, with a brief overview of its main aspects, both from the organizational point of view and from the technological point of view, as a stimulus and starting point for discussion. •Is this convergence really happening? What are the reasons? A second objective is connected to the possibility that the "convergence" may have different degrees in different countries. In order to visualize and understand differences between US and European IS teaching, and among several different ways of IS teaching within Europe, panelist with diverse international experiences will show their point of view on this issue, with the aim of starting drawing the very first traits of an IS teaching map all over Europe. We see the panel debate as a starting point for a discussion that will be hopefully extended to the participants.*

## Keywords

Information Systems, teaching, convergence, Organization Theory, IS Curriculum

## 1. Introduction

In our discipline, we are somehow used to dealing with "fast changes" and "convergence": fast-changing and converging technologies, fast changing and converging communication, fast changing and converging media are all phenomena that we are facing, in our every-day research and teaching activities. Used as we are to these two concepts, we rarely think of applying them to IS and Organization Theory. Yet, in the last thirty years of IS and Organization Theory teaching, the two disciplines kept evolving at a relatively fast pace, converging to a somehow common ground that is getting bigger in time.

To visualise the concept, in figure 1 the history of the Information Systems Curriculum is tracked down, starting from the first official document, published in 1972 (Ashenhurst 1972), until 1994.

The list is taken from the IS 97 curriculum (Davis et al., 1997); after that, the latest update, IS 2002, was recently presented and discussed in ICIS 2002, Barcellona (Gorgone et al, 2002).

May, 1972	ACM Graduate Professional Programs in Information Systems (Ashenhurst 1972)
December, 1973	ACM Undergraduate Programs in Information Systems (Couger 1973)
March, 1981	ACM Educational Programs and Information Systems (Nunamaker, Couger and Davis 1982)
1981	DPMA Curriculum for Undergraduate Information Systems Education (DPMA 1981)
1983	ACM Information Systems Curriculum Recommendations for the 80s, Undergraduate and Graduate Programs (ACM 1983; Nunamaker, Couger and Davis 1982)
October, 1984	DPMA Secondary Curriculum on Information Technology and Computer Information Systems
October, 1985	DPMA Associate-Level Model Curriculum in Computer Information Systems
October, 1985	DPMA Model Curriculum for Undergraduate Computer Information Systems
May, 1990	ACM/IEEE Computing Curriculum for Computer Science for Undergraduates
October, 1990	DPMA IS'90 draft document (Longenecker and Feinstein 1991c)
June, 1991	DPMA IS'90 Curriculum for Undergraduate Programs in Information Systems
July, 1991	ACM CS Curriculum (Turner and Tucker 1991)
January, 1994	DPMA IS'94 Curriculum for Two Year Programs in Information Systems (Longenecker, Feinstein et al. 1994)

Figure 1. Key chronology of IS Curriculum events (Davis et al 1997, page 34).

If we go back to 1983 to the "ACM IS Curriculum Recommendations for the 80s" (Nunamaker et al 1992), we read :

"The motivations for the revised curriculum built upon those that motivated earlier curriculum efforts, expanded to take into consideration changes in the importance of information systems, advances in

technology, improvements in information systems analysis and development processes, and *an increased need for information systems management skills.*" (*ibidem*, page 783).

Already in 1983 the need to take into account some "information systems management skills" was felt as quite important: yet, the proportion between technical and managerial skills was still largely in favour of the former ones. In the following sentences, the required body of organizational knowledge is better specified as just an *understanding* of some key organizational concepts:

"Because of the organizational context of the work environment for the IS graduate, the structure of the curriculum assumes *an understanding* of organizations, organizational processes, and functions within organizations. The information systems designer/implementer is a boundary spanner and a change agent. Therefore, the organizational knowledge should include *an understanding* of the typical problems encountered by boundary spanners and change agents and the common concepts, strategies, and tools required of the individuals performing such roles." (*ibidem*, page 784).

If we move forward another 14 years, to 1997, the convergence process becomes more evident: on one side, IT is now "pervasive" in the whole organization:

*"Information technology is pervasive in all organization functions. It is used by accounting, finance, marketing, production, and so forth"* (Davis et al., 1997, pag. 7).

On the other side, building information systems requires now heavy and deep organizational skills:

"The activity of developing systems for organization and inter-organization processes involves creative use of information technology for data acquisition, communication, coordination, analysis, and decision support. [...] *Creating systems in organizations includes issues of innovation, quality, human-machine systems, human-machine interfaces, sociotechnical design, and change management*" (*ibidem*, pag. 7).

In consequence, in the IS'97 body of knowledge, organizational issues occupy now a significant position, (2.0: Organizational and Management Concepts) as reported here in figure 2. The organizational and management concepts include now a wider and deeper range of topics, including organization theory, decision theory, organizational behavior and change management

A somehow similar convergence process may be observed in the Organization Theory discipline: the wideness and depth of the issues directly or indirectly connected to the Information Technology kept growing from year to year: for an overview see for example (Pontiggia 1997) or (McLoughlin 1999).

The aim of the panel is to explore this convergence process, in order to better understand some important issues connected to teaching Information Systems today. In the next section we are going to identify some of the key aspects that may deserve our attention.

<b>Body of Information Systems Knowledge</b>	
<b>1.0 Information Technology</b>	
1.1	Computer Architectures
1.2	Algorithms and Data Structures
1.3	Programming Languages
1.4	Operating Systems
1.5	Telecommunications
1.6	Database
1.7	Artificial Intelligence
<b>2.0 Organizational and Management Concepts</b>	
2.1	General Organization Theory
2.2	Information Systems Management
2.3	Decision Theory
2.4	Organizational Behavior
2.7	Managing the Process of Change
2.8	Legal and Ethical Aspects of IS
2.9	Professionalism
2.10	Interpersonal Skills
<b>3.0 Theory and Development of Systems</b>	
3.1	Systems and Information Concepts
3.2	Approaches to Systems Development
3.3	Systems Development Concepts and Methodologies
3.4	Systems Development Tools and Techniques
3.5	Application Planning
3.6	Risk Management
3.7	Project Management
3.8	Information and Business Analysis
3.9	Information Systems Design
3.10	Systems Implementation and Testing Strategies
3.11	Systems Operation and Maintenance
3.12	Systems Development for Specific Types of Information Systems

Figure 1. Key chronology of IS Curriculum events (Davis et al 1997, page 34).

## 2. Panel Objectives

The first objective of the panel is to explore this idea of convergence. To this aim, the panelists will conduct a brief overview of the related aspects, both from the organizational point of view and from the technological point of view.

*Is this convergence really happening? What are the reasons?*

This is more a book issue than a panel question, but here the objective is just to introduce some key aspects and start a discussion.

A second objective is related to the differences between US and European experiences. The IS curricula initiatives are an invaluable reference model for every IS teaching initiative, but not every IS course has necessarily to be in accord with them, especially in Europe. In its last update, IS 2002 says:

"Although ACM, AIS and AITP are worldwide organizations, IS 2002 does not represent a universal global IS curriculum. It does not seek to harmonize the curriculum to meet the requirements of different educational systems around the world. The model curriculum for

undergraduate degree programs in information systems is based on the typical degree structure in USA and Canadian universities. The IS model curriculum can serve as a useful reference by curriculum designers and developers outside North America in designing and developing information systems degree programs as its predecessors have done over the past decades." (Gorgone et al 2002, page 924).

European countries have had, in their history, diverse and, often, diverging IS teaching traditions. Moreover, the convergence process between IS and Organization Theory had not the same effects everywhere. In consequence another question we could ask would be:

*To which degree may we say that this convergence process has had its effects also in IS teaching in Europe? What about our experiences of IS teaching in Europe?*

### **3. Panel Structure and Contents**

The role of the participants is strictly related with the two objectives introduced in the previous section. The panel has two sections, one for each objective.

In section one, Andrea Pontiggia, who will act also as moderator, will introduce the topic and will select some "leading themes" in Organization Theory, giving a critical account of their relevance and contribution to the convergence process.

Domenico Ferrari, on the other side, will select and critically analyse some key innovations in the history of Information Technology, trying to figure out if technology evolution itself may have had a specific role in the convergence process. In particular, he will stress the impact on education of the introduction of the Internet into Information Systems, and of its profound organizational effects.

Claudio Ciborra may give his contribution in this section illustrating how Information Systems may have been gradually connecting the two grounds (Organization and IT) over time.

In section two, Claudio Ciborra, Manfred Grauer, Karl-Heinz Kautz, Marcello Martinez and Sandra Sieber will deal with the second objective of the panel, i.e. to uncover and explore diversity and specificity of European experiences in IS teaching.

Claudio Ciborra will illustrate the convergence between Organization theory and IS as it is being implemented in the Master in IS at London School of Economics, one of the largest in the UK.

Manfred Grauer will depict a panorama of "Wirtschaftsinformatik" courses in the German speaking countries, with a special focus on the initiatives he has personally directed. Prof. Grauer will report his view as a member of the accreditation-commission for Wirtschaftsinformatik in Germany.

Karl-Heinz Kautz will introduce the course programme on 'Computer Science and Business Administration' which has a focus on Information Systems. Furthermore, Prof. Kautz will analyse the historical roots of the programme in a Scandinavian context and relate it to some of its constituting fields and to similar education initiatives in Europe and the US.

Marcello Martinez will provide an overview of some relevant training projects and initiatives in Organization and Management of Information Systems being undertaken in Southern Italy.

Sandra Sieber will introduce and contrast the IS courses taught at IESE, Barcellona, with the aim of evidencing differences and similarities.

Contributions and discussions are expected from the panel participants. The format of the discussion will be oriented to interaction with all the other participants, both panelists and audience. To this aim the panelists will have only a very short presentation to introduce their topic, in order to leave time for interaction, questions and discussion.

All the 7 panelists have made a commitment to attend the conference and serve on the panel, if the proposal is accepted.

## 4. Expected Outcomes

Given the amplitude of the theme and the necessarily limited time allotted to the panel, what we mainly expect is idea dissemination and discussion. It would be desirable to come out with the first traits of a map of IS teaching experiences in Europe, with a special focus on the proportion between organizational and technical contents that each country/institution regards as optimal. The discussion on the factors determining this "optimal" proportion, given the convergence process, can only be at its starting point. The auspice is to have a stimulating starting point and a fruitful continuation.

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