

# Research Methodologies for Management Information in Romania

■

**Ofelia Aleca**

**Florin Mihai**

**Andrei Stanciu**

**Marinela Vrîncianu**

The Bucharest Academy of Economic Studies

***Abstract.** The rocketing trend manifested in the last years in the information system domain has led to a considerable increase of research activity in this field. The purpose of this article is to identify the main research methodologies in management information systems in our country and in European space. Based on our research's results, we present specific categories for research classification and describe various new trends in scientific publications related to management information. In our research we used empiric methods based on knowledge extraction from databases and archives related to various representative publications in management information field.*

**Keywords:** management information system; research methodologies; modeling; analysis.

■

**JEL Codes:** 23I.

**REL Codes:** 4A, 2B.

## Introduction

Interactions between informatics and other scientific domains has determined a great interest in academic research area for interdisciplinary studies, most of them referring to management sciences. Meanwhile, there could be observed a growing interest in making decision area and also in designing and modelling of information systems for economic system's analysis and evaluation. The high level of complexity of economic systems involves the use of various methods for modelling and analysis of information system designed for the system management.

We have focused our studies on the research methods related to management information systems and we have tried to make a comparative analysis of methodologies in Europe and in Romania.

### A short history of management information systems science

Probably the turning moment, when the management science was born, was when the book *Principles of Management* by Frederik Winslow Taylor was printed, in the early 90s. In the same period of time, the management sciences gain their autonomy and became popular in universities. The first reporting about management science in United States could be mentioned in 1954, and in 1970 in France there were founded the bases of the discipline known as "science de gestion". The IT technology has been played an important role over the years in the development of management sciences and the dynamic growth of computer power allows problems of great complexity to be solved.

Ionașcu (2007) pleaded for the recognition of management sciences in Romania, delimiting

the role of management science in the global context of economic sciences. The main objective of management science is defined as the study of ways to manage, conduct, structure and develop specific organizations.

Simon (1982) has identified the differences between economy and management sciences as following. "The economy has discovered the market institution, the pricing mechanisms as process of adjustment. The management has discovered the institution of formalized organization, mechanisms of authority and interpersonal influence to ensure coordination. The management has discovered the planning as a mean of making decisions. Enterprise has become the border between economics and management".

In international area studies, a reference point for documentation is the prestigious magazine classified ISI JMIS – Journal of Management Information Systems, ISSN: 0742-1222 (<http://www.jmis-web.org/toppage/index.html>). This documentation source enables viewing of works indexed according to specific keywords.

### Research methodology

To achieve this study were used several databases. The first was the archive of the Journal Science in accounting and management information systems available on [www.cig.ase.ro/revistacig](http://www.cig.ase.ro/revistacig), magazine ranked by CNCSIS in the B+ category. All the articles related to thematic area of IT management were included.

The second source was the library that contains the details of the paper from the ECIS (EndNote ECIS, 2007) conference, as a source of relevant information reflecting the trend of scientific research in information management in Europe. Information

gathered from these two sources was managed with a Microsoft Access database.

### **Research methods used in the management information systems domain**

The purpose of research in the information systems focuses on the contributions made by information systems in achieving social ideals (Orlikowski, Baroudi, 1991; Hirschheim, Klein, 1994; Ngwenyama, Lee, 1997; Klein, Myers, 1999; Brooke, 2002b; Myers, 2004; Bryman, 2004).

The methodology is understood by Dubravka Cecez-Kecmanovic (2007) as a global strategy for conceptualisation and development of research, focusing particularly on methods of specific empirical research approached from a positivistic, interpretive or critical point of view.

Dubravka Cecez-Kecmanovic (2007) identifies three main lines of a methodology: the first being able to choose from a variety of critical theories and to formulate specific questions; the second is the methods opportunity and the methods application which must be evaluated on the basis of epistemological assumptions and depending on the type of critical questions investigated, while the third methodology harmonizes the principles and processes of building scientific knowledge.

Chua (1986) identifies three categories of research epistemology classification: positivistic, interpretive and critical perspectives.

The purpose of positivistic research in information systems domain is to test theories and causal realities that explain and predict phenomena in the development and use of information systems and analyse the impact on organizations.

In this methodology it is used the hypotheses testing and the estimation

(forecast) based on population samples (Orlikowski, Baroudi, 1991). A special category in the positivistic research is the category based on the descriptive articles that typically include case studies, with or without descriptive statistics (frequencies and percentages). Survey and controlled experiments are techniques for collecting primary data, meanwhile statistics are methods of data analysis used to “discover” causal link (Orlikowski, Baroudi, 1991). In the interpretative research of information systems, unlike the positive research, researchers combined the results of their own subjective opinion, considering the reality as a social product that can not be understood independently of social actors (including researchers), who are also “builders” and who influenced the design of the subject of studies (Orlikowski, 1993; Walsh, 1993; 2001; Klein, Myers, 1999). Instead of formulating conclusions as established facts, interpretative research provides form of interpretation (Dubravka Cecez-Kecmanovic, 2007).

Critical research aims to critique and explain the use of information systems (IS) in organizations and society, systems that, for efficiency reasons, require rationality, progress and development, sometime with negative social consequences (Dubravka Cecez-Kecmanovic, 2007). Researches developed within this theory are related to time and context and are common for researching and case studies in historical and ethnography studies (Chua, 1986).

The framework proposed by Dubravka Cecez-Kecmanovic (2007) for a critical research methodology includes four distinct but interrelated components: a) detailed and intensive examination of local situations and

problems that affect real people, working conditions and organizations, b) critical explanation and comparative structural generalization c) open discourse and transformative redefinition or action, and d) reflexive dialectic orientation.

**Data analysis**

Issues addressed in the scientific research regarding management information systems is quite extensive, including systems design, measuring of effectiveness, the influences of the management information systems and, not at least, the security.

As a research topic at the border of several interdisciplinary sciences, the research in management information systems domain is influenced by:

- The dynamics of technological changes. The emergence of new technological solutions involves analyzing and evaluating how they respond to new challenges.

- Evolution of research in related fields (accounting, management).

- Linguistic turn. The linguistic turn has already impacted IS and this impact may well increase. The language game of re-naming is practiced to a certain extent within the discussion of knowledge management and the transition of Enterprise Resource Planning Systems to Enterprise Systems. Importantly, the linguistic turn not only impacts at the “application level”, but also on the methodological level. If the nature of language is considered, then positivist methodological dominance in IS must be questioned (Dreiling, 2007).

Classification of research in management information systems has been enounced by several authors. Banker & Kauffman (2004) have proposed a classification of scientific research in management information systems domain, based on papers published until 2004. This classification was later adapted in the study by Galliers & Whitley (2007).

**Categories used to classify research in management information systems**

Table 1

Category	Methods	Key words
Decision support systems	Mathematical programming, forecasting, simulation, expert systems	Systems to assist decision, Models, Decisions
System development	Experiments, argumentation, simulation, system test-beds	Systems development, Systems design, Planning systems, Architecture, Modelling
Human	Experiments, argumentation, simulation, system test-beds	Interfaces, Users
Research issues	Case studies, Experiments, empirical analysis	Case studies, Research on information systems, Knowledge
IS organization and strategy	Models, case studies, experiments, argumentation, blend of qualitative and quantitative methods	Organizational management, Enterprise resource planning, Internal market, Strategy, Outsourcing, Business
Economic	Analytical modelling, empirical analysis, cross-sectional and longitudinal design, experiments, simulation	IT productivity, Economy

Category	Methods	Keywords
Technology	Analytical modelling, empirical analysis, cross-sectional and longitudinal design, experiments, simulation	Networking
Society	Analytical models, statistical analysis, simulation, empirical analysis	Governance, Public sector, Public services, Society
Electronic Markets	Analytical models, statistical analysis, simulation, empirical analysis	Electronic commerce, Electronic markets

Source: Adjustment after Banker & Kauffman, 2004 and Galliers & Whitley, 2007.

## Results

The results based on data analysis are presented in the following graph:

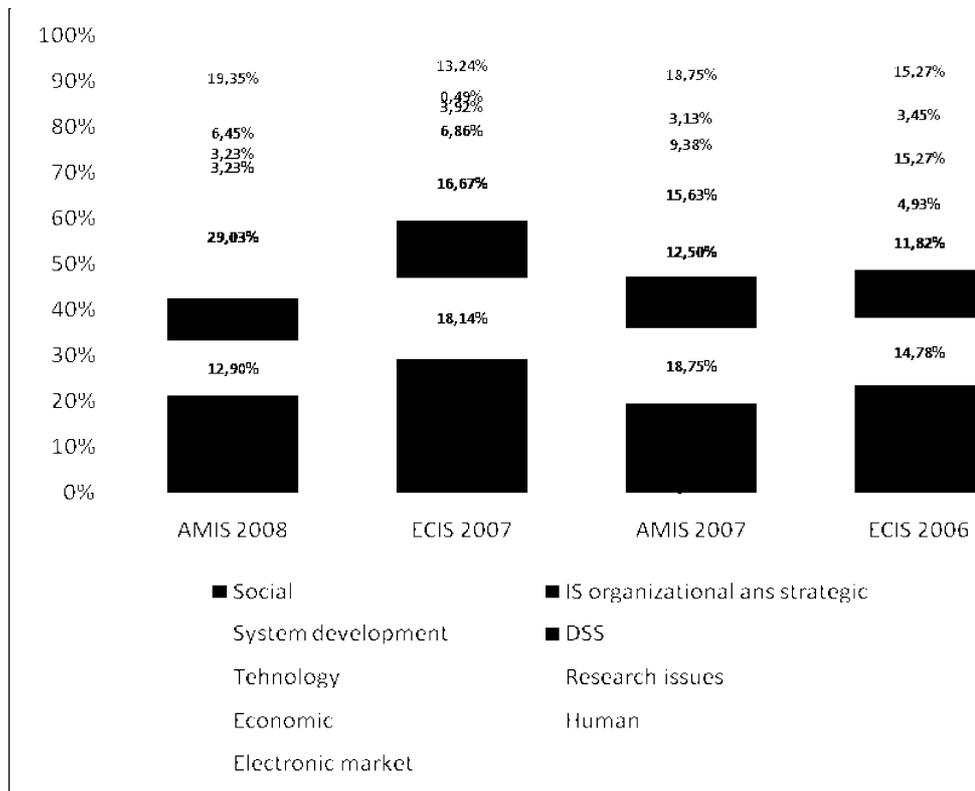
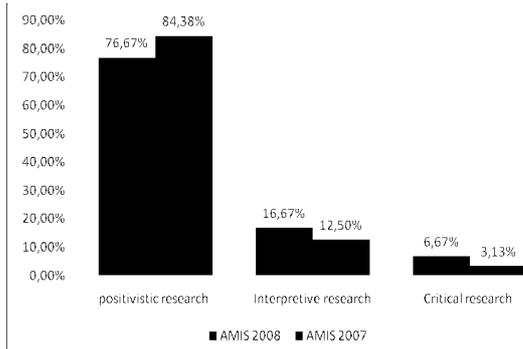


Figure 1. Percentages of articles in various conferences held by each category of research in information sciences

Most papers from 2008 at the AMIS conference falls in the Technology category (29.03%), compared to 12.5% in 2007 at the same conference. System development category has about the same percentage each year for AMIS and ECIS Conference.

Unlike in 2007, when the articles in AMIS conference in category “Research

issues” had 15.63%, in 2007 at the same conference, articles in this category had a substantially lower percentage, only 3.23%. In terms of research type, positivistic research is the most common style in the articles held within the international conference AMIS.



**Figure 2.** The number of works by each category of research

## Conclusions

The aim of our studies is to provide an analysis of areas of interest in the research of management information systems. We have tried to achieve a classification of the papers presented in various sessions of scientific communications in nine categories, depending

## References

- Banker, R., Kaufman, R. (2004). „The evolution of research on information systems: a fiftieth year survey of the literature in management science”, *Management Science*, 50(3), pp. 281-298
- Brooke, C., „What does it mean to be ‘critical’ in IS research?”, *Journal of Information Technology*, volume 17, no. 2, 2002b, pp. 49-57
- Bryman, A. (2004). *Social Research Methods*, 2<sup>nd</sup> ed. OUP
- Chua, W.F., „Radical Developments in Accounting Thought”, *The Accounting Review*, 61, 1986, pp. 601-632
- Dreiling, A. (2007). *On the impact of the ‘linguistic turn’ on research in information systems*
- ECIS endnote (2007), „Endnote Libraries for ECIS conferences”, Arhived at <http://is2.lse.ac.uk/asp/aspecies/default.htm>.
- Galliers, R.D., Whitley, E.A., „An Anatomy of European Information Systems Research ECIS 1993-ECIS 2002: some initial findings.” *In 10<sup>th</sup> European Conference on Information systems*, 2002, pp. 3-18, Gdansk, Poland
- Hirschheim, R., Klein, H., „Realizing Emancipatory Principles in Information Systems Development: The Case for Ethics”, *MIS Quarterly*, volume 18, no. 1, 1994, pp. 83-109
- Ionașcu, I., „Învățământul superior de gestiune, între „mcdonaldizare” și căutarea excelenței”, *Economie teoretică și aplicată* nr. 2/2007
- Dubravka, Cecez-Kecmanovic (2007). *Critical research in information systems: the question of methodology*
- Klein, H.K., Myers, M., „A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information”, *MIS Quarterly*, Special Issue on Intensive Research (23:1), 1999, pp. 67-93
- Myers, M.D. (2004). „Qualitative Research in Information Systems”, *MIS Quarterly* (21:2), June 1997, pp. 241-242. MISQ Discovery, archival version, June 1997, [http://www.misq.org/discovery/MISQD\\_isworld/](http://www.misq.org/discovery/MISQD_isworld/). MISQ Discovery, last modified: February 27, 2004 [www.qual.auckland.ac.nz](http://www.qual.auckland.ac.nz)
- Ngwenyama, O., Lee, A., „Communication richness in electronic mail: Critical social theory and the contextuality of meaning”, *MIS Quarterly*, vol. 21, no. 2, 1997
- Orlowski, W.J., Baroudi, J.J., „Studying Information Technology in Organizations: Research Approaches and Assumptions”, *Information Systems Research* (2), 1991, pp. 1-28
- Simon, H.A. (1982). *Models of Bounded Rationality*, vols. 1 and 2., MIT Press

on the keywords associated with each article. For each of these categories it has been described a set of methodologies and techniques whose application is best suited for the specific encountered problems.

Interdisciplinary research in the field of information technology has known in the last years a sustained increase, being further characterized by analysis of problems related to management information systems, including managing business processes, IT Governance, data analysis and support systems to support decision making.

Research in the science of management information systems continues to play a key role in the economic field, especially through various ways of providing support for management decisions.