The Framework for IS Curriculum Design

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ABSTRACT

According to the authors of this paper, one of the reasons for information systems failures may be seen in the way in which Information Systems are taught. The assumption that lack of understanding of the business environment is the main reason for further system failures leads to proposing a framework for Information System Curriculum, which is close to current business trends.

Keywords: Information System failure, Information System Curriculum, Staff Research

1. INTRODUCTION

The Information Systems community long time is concerned about failures from the beginning of its existence. However, only a little progress has been made. The book was written by Brooks (1975) after over 40 years from the publication date it remains actual. According to Dalcher and Drevin (2003), the term software crisis was the first time in use during the NATO conferences in 1968 and 1969.

Some theories are explaining why information systems fail. For example, Lyytinen (1988) is seeing information system failure as a gap between delivered systems and stakeholder expectation. After bad experiences with the failure of London Ambulance System Robinson (1994; More on that case: Sutcliffe and Thef, 2010; Finkelstein and Dowell, 1996) proposed a social definition of information failure as a difference between goals and expectations leading to different views on the success or failure of a particular IS outcome e.g. (Spedding, Wood-Harper, 1999).

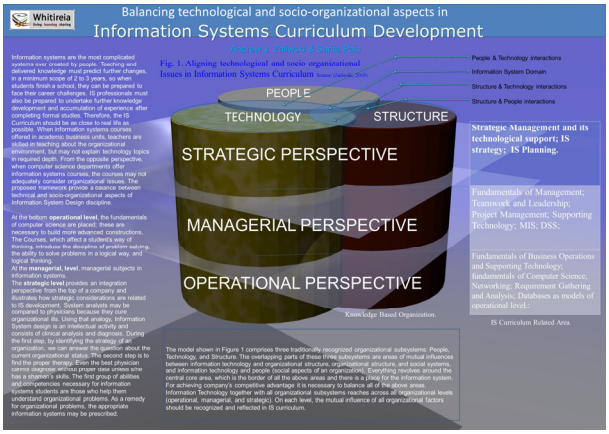

Figure 1. The IS Curriculum Framework

2. DIFFERENCE BETWEEN IS AND CS

Many authors' points a difference lying in a border between Business domain and Computer Science domain: "*Information Systems (IS) is about the use of technology and ideas for tactical and strategic advantage in business. It is not about mathematics; most people in the discipline do not write computer programs. Instead, they spend time creatively, identifying business opportunities and problems and devising approaches and solutions*" (ECU, 2002). (Cited in Prasad, Li, 2003).

The another interesting distinction between computer science and information systems (Khazanchi & Munkvold, 2000): "*while computer science is about how computers work (as hardware and software), and software engineering is about building technical systems (ensembles of hardware and software) that meet given specification, information systems is about understanding what is or might be done with these technical systems, and the effects they have in the human/organizational/social world*". Also, information systems professional organization AIS define information systems in its mission in a similar way: "*to advance knowledge in the use of information technology to improve organizational performance and individual quality of work life*").

The system failure in most cases is a result of mistakes made during gathering business requirements due to lack of understanding of the business environment. For business success, there is necessary that two different subsystems: people and machines will work together to create one well-designed system. The both sub-systems are interconnected and depend on each other. Information technology enables new organizational forms, and new organizational structures allow better use of IT. Traditionally human aspects are described by social sciences (including business), and machine aspects are described by engineering sciences (e.g. computer science). There is a place where well engineered formal criteria meet real business environment created by people behavior which is difficult to describe informal way required by design methodologies. In the above context information system failures may be recognized as a result of a lack of balance between business and computer science in information system curriculum.

3. THE CURRICULUM FRAMEWORK

Information systems are the most complicated systems ever created by people. Teaching and delivered knowledge must predict further changes, in a minimum scope of 2 to 3 years, so when students finish a school, they can be prepared to face their career challenges. IS professionals must also be prepared to

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undertake further knowledge development and accumulation of experience after completing formal studies. Therefore, the IS Curriculum should be as close to real life as possible. According to Gorgone et al. (2006), when information systems courses offered in academic business units, teachers are skilled in teaching about the organizational environment, but may not explain technology topics in required depth. From the opposite perspective, when computer science departments offer information systems courses, the courses may not adequately consider organizational issues (Connolly, Paterson, 2011).

The model shown in Figure 1 comprises three traditionally recognized organizational subsystems: People, Technology, and Structure. The overlapping parts of these three subsystems are areas of mutual influences between information technology and organizational structure, organizational structure, and social systems, and information technology and people (social aspects of an organization). Everything revolves around the central core area, which is the border of all the above areas and there is a place for the information system. For achieving company's competitive advantage it is necessary to balance all of the above areas. Information Technology together with all organizational subsystems reaches across all organizational levels (operational, managerial, and strategic). On each level, the mutual influence of all organizational factors should be recognized and reflected in IS curriculum (Fig. 1).

At the bottom **operational level**, the fundamentals of computer science are placed; these are necessary to build more advanced constructions. The Courses, which affect a student's way of thinking, introduce the discipline of problem-solving, the ability to solve problems in a logical way, and logical thinking. Also, the other computer science courses (Databases, Operating Systems, Computer Fundamentals, etc.) may be located here, as they provide the technological building blocks for information systems creation.

At the **managerial, level**, managerial subjects in information systems (Project Management, Change Management, and other subjects) should be considered.

The **strategic level** provides an integration perspective from the top of a company and illustrates how strategic considerations are related to IS development. System analysts may be compared to physicians because they cure organizational ills. Using the analogy, Information System design is an intellectual activity and consists of clinical analysis and diagnosis. During the first step, by identifying the strategy of an organization, we can answer the question about the current organizational status. The second phase is to find the proper therapy. Even the best physician cannot diagnose without proper data unless s/he has a shaman's skills. The first group of abilities and competencies necessary for information systems students are those who help them understand organizational problems. As a remedy for organizational problems, the appropriate information systems may be prescribed.

4. CONCLUSION

Interim results of the joint ACM/IEEE-CS Curriculum Committee on IS Curricula (Roberts, et al., 1999) underlined the necessity for integration (Peterson, 2004; Topi et. al., 2010; Panetto, Cecil, 2013) of information technology with business foundations, and with organizational culture (Gorgone, 2000; Gorgone, et al., 2006). Three forms of integration are suggested: integrating the organization, integrating the IT resources, and integrating technology. Potential employers seek IS professionals who have skills focused on the integration (Randal, Price, 2006; Plice, Reinig, 2007) of information technology, information resources, and business strategy. The framework presented in this paper may be usable for designing an integrated curriculum adequate for employers' needs, balancing IT and organizational issues (Radhakrishnan et. al., 2008).

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