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Addressing the Discrepancy between Workforce Skills Expectations and Undergraduate Information Systems Education

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Abstract:

This panel addresses the topic of the perceived discrepancy between workforce skills expectations and undergraduate IS education. Literature research, employer surveys, education jam sessions, and informal interviews reveal that there is a gap between essential competencies expected by employers in the workplace and what is being taught in the information systems curriculum. The problem possibly stems in the focus of some Information Systems program (IS), and Computer Information Systems (CIS) curricula. If so, it appears that there is a need to reconcile industry expectations with what is being taught in academia. Within this context workshops have been targeted to upgrade IS curriculum (ACM/AIS in 2016) and project management curricula PMI (2015). We have an opportunity here in the panel to discuss and integrate our current knowledge about IS learning outcomes, competencies and curriculum. Key questions addressed by the panel: Is there a talent gap? If so, why is there a gap? What are the gaps in competencies? What is being taught today and what are the expectations from the workforce for students? How can we go about addressing the gaps in education? Should our core learning outcomes be upgraded?

Keywords: Information systems, information systems curriculum, information technology changes, workforce expectations, teams, management of projects, skills gap.

Introduction

Information systems (IS) curricula have been the subject of debate and discussion, as to their proper planning, design, and implementation for a long time. Arguments whether a skills gap exists between what is being taught in IS curricula and what is really needed in the industry persists widely in literature (Yongbeom, 2006). There appears to be a basis for such a continuing discussion. A quick research of jobs at *monster.com* or *dice.com* will reveal that thousands of information systems jobs are available and many remain unfulfilled. At the same time, in academia, we anecdotally continue to hear of graduating IS students not finding any employment.

Description of the Topic

A substantial body of literature indeed points to gaps in skills and competencies in the market place. A recently published book Technology Skills Gap (Beach, 2013) describes the US skills gap in detail. The author concludes that this should be an issue of concern for every business and information technology executive in the United States. The book appears to allude to a root cause for the gap – a lack of comprehensive education in disciplines such as computing, math and sciences at the high school level. There are several studies, journal papers and updates on the topic of IS/IT skills gap (Yongbeom, 2006; Bersin, 2012; Aasheim, C., Williams, S., Butler S., 2009). A business education jam conducted recently also uncovered issues on the topic of skills gap in business education (Education Jam, 2014). Finally, a talent gap report as it pertains to management of projects points to a huge shortage by 2020 (Talent Gap Report, 2013).

At the same time information technology is evolving rapidly. Consider the case study of Uber. In six years, Uber has grown to more than 4,500 employees in 61 countries and has a net worth that exceeds $50-billion. A recent Wired magazine article indicates that in addition to moving people around, Uber is taking a stab at moving packages, couches, and pizzas—among other things. It has a team in Pittsburgh, building self-driving cars and it's working on its own mapping software (Hempel, 2015). Due to rapid changes occurring in businesses such as Uber, it can truly get complex to design and teach a range of IS courses.

The skills gap between the expectations of employers and IS graduates could lie in the primary focus of Information Systems program (IS) or Computer Information Systems curricula (CIS). Are IS programs putting in heavy emphasis on topics such as business processes or organizational principles, and sparing the focus on innovation, strategy, or management techniques? Computer Information Systems programs are technical by nature and put in substantial emphasis on technology topics. However, is it important to focus a lot of resources teaching skills such as installing, customizing, & maintaining applications, or on topics such as network administration? It appears that there is a need to reconcile the expectations of the industry into our curriculum. Indeed, it is timely that largely in reaction to changes in the IS field caused by the networked society, information technology, and markets and society, AIS and ACM recently set up a task force to update curriculum recommendations in information systems (Carvalho, 2015). An invigorated curriculum can possibly address the concerns of student enrolments for IS majors in some schools.

A discussion of soft skills vs. hard skills is useful. Examples of soft skills include problem solving skills, interpersonal skills such as teamwork, and leadership. Some such skills can be slightly more *technical* and cover knowledge of business processes, and management of projects (for example, tools and techniques to estimate costs or agile software development). Examples of hard skills could be programming languages or network or security administration. How do we balance hard and soft skills? Which is more critical? Literature research reveals some biases. The knowledge and skills required of entry-level FT workers as perceived by nearly 600 IT managers and workers from across the United States appears to suggest that personal and interpersonal skills are top rated with technical skills following closely behind (Aasheim, C., Williams, S., Butler S., 2009). But we also believe that are several distinct clusters within IT and that each cluster has a markedly different profile of needed skills.

Finally, Project Management Institute (PMI) set up a faculty task force two and a half years ago and invested a million dollars to investigate project management curricula issues in disciplines such as Information Systems. The curriculum guidelines reveals a significant opportunity to address the discrepancy between workforce skills expectations and existing curricula (Task Force on PM Curricula, 2015).

In conclusion, there is an opportunity to discuss the topic of the perceived discrepancy between workforce skills expectations and undergraduate IS education. The overall topic of addressing the gap between graduate skills sets and reconciling our curriculum with employers' needs and expectations is both relevant and critical. This is a recurring theme we hear from employers and something most faculty attempt to remedy frequently. In our panel we have an opportunity to review various issues and come up with recommendations.

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Panel Participants

1. **Kanabar, Vijay.** (Panel Chair) Director and Associate Professor, Boston University, Computer science and Administrative Sciences Dept., Boston, MA, USA. kanabar@bu.edu. Vijay has been teaching CIS in North America for over three decades. He is the current chair of the Curriculum Guidelines committee for project management.

2. **Klein, Gary.** Couger Professor of MIS, University of Colorado, Colorado Springs, CO, USA. gklein@uccs.edu. Gary has been teaching been teaching IT and ITPM for 35 years and has developed and maintained the IT major at three highly-rated universities based on community input.

3. **Messikomer, Carla.** Project Management Institute, Newtown Square, PA, USA. Carla.messikomer@pmi.org. She is a sociologist and research scholar who has published in the field of organizational ethics and healthcare. She is the co-editor of Advancing Human Resource Project Management.

4. **Niederman, Fred.** Professor and Shaughnessy Professor of MIS, Management Dept., Saint Louis University, St. Louis, MO, USA. fniederman@sbcglobal.net. He promotes grounded theory and theory building as a way to enrich the MIS discipline and build intellectual content customized specifically to MIS

The chair will introduce each of the panellists and their unique academic experience. He will then request each of the panellist members to quickly introduce the topic of skills and competencies from their vantage point. Subsequently to raise the debate, panellists will take a strong position and invite questions and participation from the audience. Kanabar is willing to take a strong position that soft skills are more important than technical skills in any IS curriculum. Klein is willing to argue that we need a greater focus in the IS curriculum on current development technologies even at the expense of the softer skills.

Niederman will argue that there are different clusters and that each cluster has a markedly different profile of needed skills. Messikomer will explain why organizational ethics is "the most" critical IS competency and also take a position on project management. The chair will integrate audience input and conclude with a "Letterman-like" top ten recommendations!