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## CURRENT STATUS AND FUTURE GOALS OF THE GLOBAL CC2020 PROJECT: INTERACTIVE TUTORIAL

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### Abstract:

The purpose of this tutorial is to give the conference participants an update on the current status and future goals of the global CC2020 project. It will also provide the SIGED community with an opportunity to participate in a discussion that gives the CC2020 steering committee qualitative feedback, contributing directly to the outcomes of the project. The tutorial will actively solicit participant contributions and serve as an important mechanism for interaction between the project and the SIGED community. The topics will include a) general introduction to the project and its goals; b) use of competencies as common currency for curriculum analysis; c) use of visualization to compare computing degree programs; and d) lessons for the information systems discipline from the CC2020 project.

**Keywords:** CC2020, computing curricula, curriculum visualization, competencies

### I. PURPOSE

The purpose of this tutorial is to give the conference participants an update on the current status and future goals of the CC2020 project and to engage the SIG-ED community in a discussion that will provide qualitative feedback to the CC2020 organization, contributing directly to the outcomes of the project.

### II. BACKGROUND

CC2020 is a joint initiative of ACM and IEEE-CS as primary sponsors with additional support from AIS, EDSIG, and several national computing societies. The main goal of this three-year project is to identify, analyze and report the differences and similarities between computing disciplines, building on the foundation of the influential CC2005 Overview Report (Shackelford et al., 2005). In addition, CC2020 intends to recognize key trends in computing education to provide various stakeholders tools to anticipate the future and prepare for it. The main target audience categories include prospective and current students, educators, educational administrators and leaders, policy makers, and employers hiring computing students.

The CC2020 project is led by a 13-member steering committee that, in turn, is supported by a 45-member task force. Both groups consist of academics and industry representatives from around the world (in the case of the steering committee from eight countries and four continents). Broad global representation has been one of the key goals of the project from its inception. This has clearly influenced the project positively, forcing the process to consider a wide range of different perspectives driven by multiple educational systems and philosophies.

The final outcomes of the CC2020 project will include four categories of deliverables, the current status of each will be discussed during the tutorial:

- CC2020 report, which will address the overall computing and computing education landscape, explore the specific characteristics of subdisciplines of computing, outline the foundational characteristics of a competency-based approach to modeling degree outcomes, discuss the similarities and differences between computing disciplines, describe

the interactive tools discussed below and their conceptual foundation, and examine the future of computing education.

- CC2020 interactive tools, which will provide the users with a mechanism to discover differences and similarities between computing disciplines with the support of visualization approaches.
- CC2020 website, which will not only be the primary home for the interactive tools, but also provide visitors with access to the latest version of the project report, project publications and presentation materials, a discussion forum, etc.
- Papers and presentations produced by the project throughout its lifetime.

Some of the key areas of emphasis in the CC2020 project covered in the tutorial are as follows:

- Use of competency as the focal concept underlying the analysis and presentation of similarities and differences between the disciplines and serving as the proposed foundation for future curriculum development work in computing. The project has spent a considerable amount of work to develop a conceptual foundation to support the use of competencies in this context, including Frezza et al. (2018), Topi (2017), and Waguespack & Babb (2019). This work builds on the decision to focus on competencies made independently by the MSIS 2016 and IT 2017 projects. Competency goal specifications form a good foundation for a comparison between educational programs offered in different educational systems. They also are an excellent mechanism to enable and encourage communication between educational programs and prospective employers. Furthermore, competencies provide a language with which the computing education community can explore the role of computing as a professional discipline. They are not, however, without their challenges, particularly because they are in many contexts closely associated with vocational programs (Topi, 2018). The CC2020 project explicitly addresses these issues.
- To fulfill the visualization goals of the project, it is essential to build a conceptual foundation that allows the translation of competencies into component variables specified with at least ordinal scales. Such an approach has recently been identified within the project. Furthermore, the project is also working on an automated NLP based approach to extracting knowledge from curriculum repositories.
- Even though its direct goal is not to produce an ontology or other mechanism for enabling the use of consistent language in discussions regarding computing and computing education, CC2020 explicitly recognizes the fact that different computing education communities around the world use inconsistent and sometimes conflicting terminology. Therefore, the project is making a strong effort to maintain a high level of terminological clarity.

### III. SESSION STRUCTURE

The intent of the tutorial session is to be highly interactive and driven by participant questions and comments. It will consist of four separate segments, all of which have the same structure: a brief introduction to the topic by the tutorial facilitator, followed by a moderated conversation among the conference participants. The segments are: a) general introduction to the project and project goals; b) the use of competencies as common currency for curriculum analysis; c) the use of visualization to compare computing degree programs; and d) lessons for the information systems discipline from the CC2020 project. The tutorial will end with a brief integrative conclusion.

### IV. SESSION FACILITATOR

Heikki Topi is Professor and Chair of Computer Information Systems and Interim Chair of Information and Process Management at Bentley University. He is member of the CC2020 steering committee, bringing to the project expertise from numerous global curriculum recommendation

projects, including IS2002, CC2005, IS2010 (co-chair), and MSIS2016 (co-chair). He also serves currently as AIS VP of Education and member of the ABET Computing Accreditation Commission. He is co-author of *Modern Database Management* (13<sup>th</sup> edition) with Jeff Hoffer and V. Ramesh and co-editor of *Computing Handbook, Volume II: Information Systems and Information Technology* with Allen Tucker.

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