SWEBoK Evolution

A CSEE&T 2017 Panel Session

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Abstract—**The IEEE Computer Society's** *Guide to the Software Engineering Body of Knowledge* **(SWEBoK) has been an authoritative basis for software engineering since 2004. It also has served as a foundation for other developments including curriculum development, training, software engineering competence definitions, and licensing and certification. SWEBoK is current being updated through the** *SWEBoK Evolution* **effort. This panel session will provide an update and status of the** *SWEBoK Evolution* **and its related efforts.**

Keywords— software engineering; body of knowledge; software engineering competencies.

I. INTRODUCTION

The Guide to the Software Engineering Body of Knowledge (SWEBoK Guide) describes generally accepted knowledge about software engineering. Its 15 knowledge areas (KAs) summarize basic concepts and include references providing more detailed information. See Table I.

The IEEE Computer Society published the first edition of the SWEBoK Guide in 2004, toward the larger goal of defining software engineering as a profession [1]. The third edition, SWEBoK V3.0, was published in 2014 by the Computer Society. SWEBoK is currently available in a variety of forms. It is freely available to all as a (PDF) document through the IEEE Computer Society [2]. SWEBOK V3.0 has gained international recognition as ISO/IEC Technical Report 19759:2015. Recently, SWEBoK V3.0 is being made available as a public wiki [3].

Since its inception, SWEBoK has been a community effort. Contributors worldwide, representing industry and academia, produced the 2004 SWEBoK Guide. For SWEBoK V3.0, the editors received and resolved comments of approximately 150 reviewers from 33 countries. In the future, the Computer Society and its volunteers will continue to use transparent and open consensus processes as an integral part of SWEBoK.

As shown in Table I, SWEBoK establishes 15 Knowledge Areas (KAs) to provide a consistent view of software engineering. KAs are further refined into subareas, topics, and sub-topics. Each breakdown and its text comprise the core of the KA description, supplemented with authoritative recommended references, relevant standards and futher readings.

TABLE I. SWEBoK KNOWLEDGE AREAS

Software Requirements	Software Engineering Models
Software Design	Software Quality
Software Construction	Software Engineering Professional Practice
Software Testing	Software Engineering Economics
Software Maintenance	Computing Foundations
Software Configuration Management	Mathematical Foundations
Software Engineering Management	Engineering Foundations
Software Engineering Process	

II. SWEBoK EVOLUTION

In 2016, the Computer Society began work on the next revision of SWEBoK. The *SWEBoK Evolution* project will develop and publish future releases of SWEBoK. In addition to making any needed fixes and corrections, the effort has several objectives:

• to solicit user feedback and improve SWEBoK based upon usage experiences, identified gaps, and lessons learned from applying SWEBoK in industry and academic settings;

• to identify new topic areas for consideration (including specialty disciplines and domains of application), and topics in need of refreshment or update;

• to explore insights and proposals for improved *organization* of the knowledge in SWEBoK for both current and new audiences;

• to exploit enabling technologies for improved delivery and usage (such as semantic wikis, ontologies, meta data, and rich media); and

• to increase integration with outside sources to better reflect the "full" software engineering body of knowledge (including standards, publications, and other bodies of knowledge such as EITBoK [4] and SEBoK [5]).

In addition to being useful on its own, SWEBoK is intended as a foundation for other efforts in the areas of certification, standardization and skills description. These efforts will also be addressed by the panel.

III. SOFTWARE ENGINEERING COMPETENCY MODEL

In 2016, the Computer Society also began work on its Competency Model for the Software Engineering profession (SWECOM 2.0), in collaboration with the SFIA Foundation [6] which maintains the global industry skills model for IT and Software Engineering skills. The SFIA skills model was first published in 2000. SFIA is published in 6 languages and is widely used by employers, academic institutions, professional bodies and individuals across the globe.

The SWECOM 2.0 initiative will result in:

• a comprehensive competency model built upon SWEBoK and integrated with the established SFIA framework;

• use cases and guidance notes to encourage adoption of the SWECOM;

• updates to the SFIA skills and skill descriptions. These will form an integral part of the next version of SFIA (due in 2018); and

• an assessment of evolving ISO work [7] to provide a standards basis for the SWECOM.

IV. PANEL SESSION ORGANIZATION AND GOALS

The format of the panel session will be opening presentations from each panelist (see below), followed by questions from and discussion with the audience.

The SWEBoK panel is intended for CSEE&T attendees of any level of background and experience from industry and academia. Our hope for the panel

is to offer an overview of SWEBoK, an update on *SWEBoK Evolution*, and an opportunity to provide feedback. Since SWEBoK is an open, volunteer effort, we hope for future participation from members of the CSEE&T community; recognizing the role of that community in software engineering education.

V. THE PANEL

Stephen Schwarm (Black Duck Software) and member of the SWEBoK Steering Group will offer an industry perspective on using SWEBoK.

Peter Leather is a consultant (IT-Workforce.com) and secretary of the SFIA Council. He is chair of Committee for Competencies and Body of Knowledge of IEEE Computer Society's Professional & Educational Activities Board and is leading work on the *Software Engineering Competency Model* (SWECOM 2.0).

Hironori Washizaki is Professor and Head of Global Software Engineering Laboratory at Waseda University, member of the SWEBoK Steering Group, and Convenor of ISO/IEC/JTC1 SC7/WG20 that is leading standardization projects in terms of certification and bodies of knowledge including SWEBoK. He will describe recent efforts in ISO to provide a standards basis for software engineering certification and bodies of knowledge.

The session organizer is Rich Hilliard. He is a consultant; chair of Engineering Disciplines Committee of IEEE Computer Society's Professional & Educational Activities Board which is responsible for the *SWEBoK Evolution*; and chair of the Computer Society's S2ESC Architecture Working Group. He will moderate the panel and provide an update on the *SWEBoK Evolution* effort.

REFERENCES

[1] IEEE Computer Society, *Towards a Definition of the IT Profession*, https://www.computer.org/cms/professional-education/pdf/IT White Paper - rev0.pdf, 2010.

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[3] Software Engineering Body of Knowledge Wiki http://swebokwiki.org.

[4] Enterprise Information Technology Body of Knowledge Wiki, http://eitbokwiki.org.

[5] Systems Engineering Body of Knowledge Wiki, http://sebokwiki.org.

[6] SFIA Foundation website http://www.sfia-online.org.

[7] ISO/IEC JTC 1/SC 7 WG 20, Software and Systems Bodies of Knowledge and Professionalization.