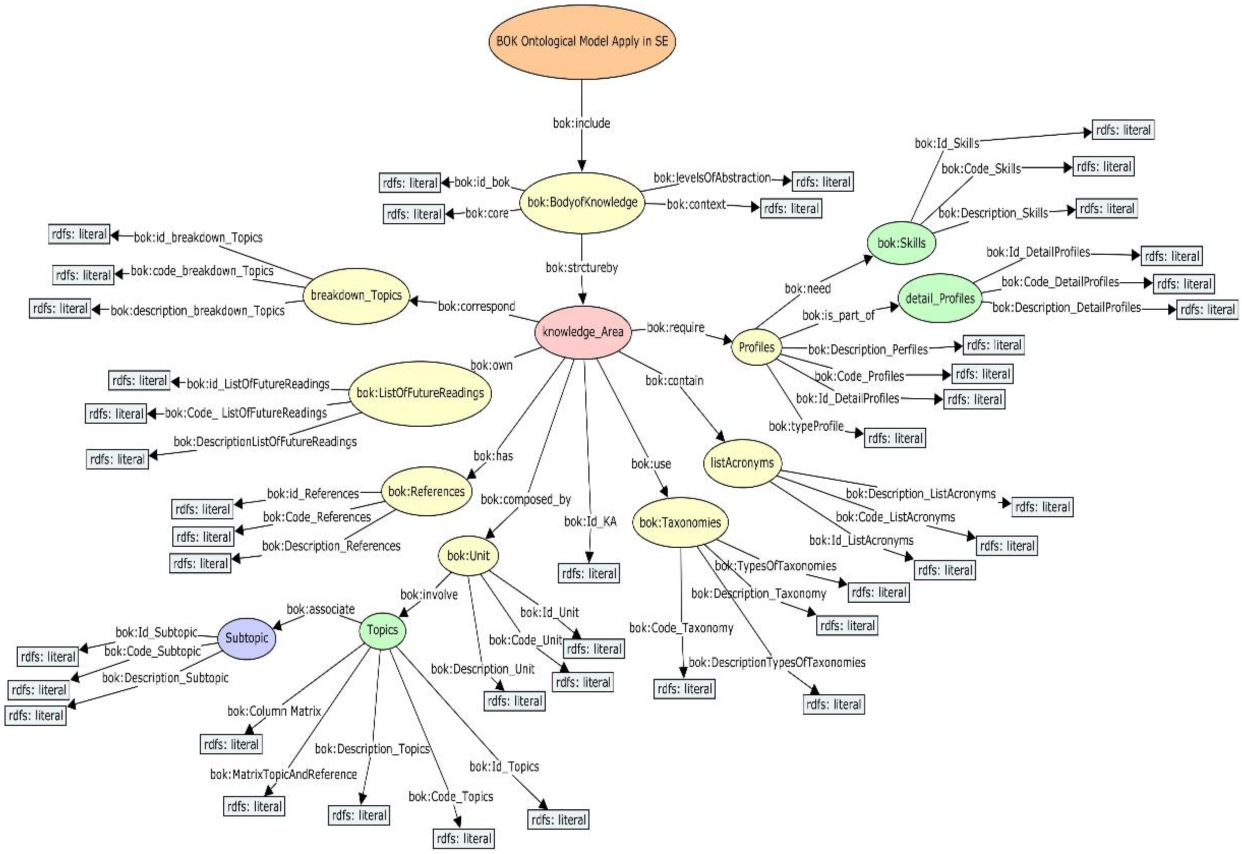

Figure 2. Ontological Model to Describe BOK (Quezada, P., Garbajosa, J., and Enciso, L. (2016))

Step 2: Evaluation of profiles through ontological models.

The ontology proposal was used to evaluate the labor and professional profiles in the area of software engineering. General ontology concepts and properties described in Scenario 2 are made, as these are needed for evaluation.

To evaluate profiles it was used SWEBOK 2014, where only the Quality Knowledge Are (QKA) was taken account. The area is divided into Knowledge Units (KU), Knowledge Topics (KT), in order to deepen the concepts of knowledge and identify sub-topics.

On the other hand, it was necessary to consider another level in the structure of BOK, where the topics will be more detailed Knowledge Subtopic (KS). The KS has addressed different knowledge and skills. In the same way, to develop a BOK it is necessary to take into account: Process Model, Deliverables, Organization, Technology focus, Tools, Assignment focus and Exercise domain Han, J. (2011). The sub-topics were extracted by experts Software Engineering, each sub-topic considered the breakdown of QKA.

Table 3. Shows the breakdown of the subtopics found in the topics of QSKA are presented.

SWEBOK 2014 Quality Knowledge Area

KA	KU	KT	KS
Software Quality	1. Software Quality Fundamentals 2. Software Quality Management Processes 3. Practical Considerations	1. Software Engineering Culture and Ethics	Features and concepts of software quality Software development Software Maintenance Software Requirements Measurement methods and acceptance criteria for evaluating the quality
		Value and Costs of Quality	Software Product Product requirements

		Prevention cost Cost of appreciation Cost of internal failure Cost of external failure Software Projects Scope of the software project Software Requirements Software life cycle
	Models and Quality Characteristics	Quality Software Taxonomy or Software Quality model Software quality attributes Characteristics models of software quality Negotiation of the quality of Software product Planning of Software product quality Transaction of the quality of Software product Software Product
		Models of quality of the Software Product (internal, external, and job quality) Quality of the software engineering process Quality of software product
	Software Quality Improvement	Software Product Software life cycle Process Process of detection error/defect Quality improvement process Quality construction, through prevention and early detection of errors Software Engineering Process Product evaluation Scope of the software project Project management
	Software Safety	Software applications Develop safety-critical software. Software test environments Software functional requirements Software performance requirements Development processes Software quality assurance Controlling software risk
	2. Software Quality Management Processes	Software Product Software life cycle Process Software Requirements Planning of Software product quality Software development Quality plan Software Maintenance Plans of Management, Development, and Maintenance for the software. Quality standards Activities and tasks of quality Software Configuration Management Software Projects

Verification & Validation	Planning verification and validation of product Software life cycle Process Software development Software Maintenance Verification and Validation of Product Techniques and tools for verification and validation of the product.
Reviews and Audits	Management reviews Technical reviews Inspections Walk-throughs Audits
3. Software Quality Requirements	Influencing factors Reliability Software integrity levels Process quality software Design methods Programming languages Software Technologies Software development Software Maintenance Taxonomy or Software Quality model
Defect Characterization	Reliability models built based fault collected Software Testing Software Engineering Process Implementation of management techniques software quality
Software Quality	Static techniques Intensive techniques of personnel Analytical Techniques Dynamic techniques Quality testing
Management Techniques	Software quality models Metrics software quality Software Product Software Quality Software life cycle Process Quality processes and software improvement Cost of quality processes Cost generic quality models Development processes Software Engineering Process Software Engineering Management
Software Quality Measurement	Reports of the software quality management Software quality metrics Software life cycle Process Software Engineering Process Software Engineering Management Development and maintenance processes

Step 3: Selection of the occupational and professional profiles.

Given a corpus of both occupational offers and professional profiles, it was obtained from of universities and employment platforms of Ecuador, two samples were taken for evaluation with SWEBOK 2014 profiles, considering among them the naked eye that may have greater alignment with a possible minor alignment with the samples to be worked, are:

1. Possibly aligned

Engineering in Computer Systems and Computer

Computer Engineering and Computer Science

2. Not aligned

Career Computer Education

Electronic and Computer Engineering Quezada, P., Garbajosa, J., and Enciso, L. (2016)

Experimentation. - To test our theory, an experiment in which 2 profiles were used. It is based on a macro algorithm that includes the following steps:

Manual description experimentation. - Manual testing is performed based on the SWEBOK 2014 guide, by reference to the area of knowledge subtopics Quality. To get the result 1, the following comparisons were performed using a matrix intersection.

R1 = (C3= ((C1=STQ vs PP) + (C2=STQ vs OP)/2)

C1 = ∑comparations/Nro. l of comparations

C2 = ∑comparations/Nro. of comparations

C3 = (∑C1 + \∑C2)/\Nro. Of Subtopic

Where:

R1 = alignment between professional and job profiles

C1 = Quality and Profiles (Skills)

C2= Quality Subtopic and Jobs offerts

C3 = Results C1 and C2

STQ = SWEBOK Topic Quality

PP = Professional Profile

OP = Ocupacional Profile Quezada, P., Garbajosa, J., and Enciso, L. (2016)

In both crosses (C1 and C2), in order to obtain numerical data, if there is any similarity it is assigned one (1), otherwise, the field being analyzed is left in blank. Upon completion of the comparison result C1 and C2 in percentages for each subtopic, versus the professional profiles and occupational, respectively bids are obtained. Once the percentages obtained, we proceed to C3, which consisted on comparing the total percentages of the C1 and C2. Quezada, P., Garbajosa, J., and Enciso, L. (2016). In the figure 3, show the experimentation, and application of the evaluation.

Figure 3. Experimentation and application of evaluation

KNOWLEDGE ASSESSMENT BETWEEN LABOR OFFER AND SKILL				
skill / labor offer	ENGINEERING IN COMPUTER SYSTEMS AND COMPUTER	COMPUTER ENGINEERING AND COMPUTER SCIENCE	EDUCATIVE INFORMATIVE	ENGINEERING IN ELECTRONICS AND COMPUTERS
Multitrabajos - IT Solutions Architect	47%	50%	38%	34%
Multitrabajos- Systems Engineer	41%	45%	32%	29%
Multitrabajos- .Net Developer	35%	38%	26%	22%
Software Developer, Web and/or Mobile Applications	38%	42%	29%	26%

CONCLUSIONS

The definition of BOK in the context of software engineering is important to respond the training needs of future professionals, so they in order to they acquire the competencies in the social, business, educational, and industrial.

The Body of Knowledge as Standard is the sum total of our human understanding of the world around us. Studies in the area of strength and conditioning make up one of the many fields of knowledge, and strength and conditioning professionals must understand how our understanding is created to successfully use it to optimize their professional practices, approaches, and exercise prescriptions and applied them in occupational context.

A general structure of BOK in the software engineering it was established. This structure begins with the set of KA, continues with KU, KT and ends with KST according to the research area.

A BOK generally uses a tree structure to represent knowledge, and a certain limit is set to its height to help its understandability and readability. In the same context the main objective of a BOK is to provide classification of knowledge and its detailed explanation.

BOK provides the basis for curriculum development and maintenance and supports professional development and any current and future certification schemes. Lastly, it promotes integration and connections with related disciplines.

A SWEBOK 2014 can fulfill to stakeholders role in supporting education, certification, professional stature, professional development, and organizational improvement.

FUTURE WORK

Contribute to improving the overall structure of the BOK where Knowledge Area includes both the area of engineering, science.

Joining the IEEE and ACM efforts in improving the SWEBOK Guide.

Adapting the curriculum of software engineering to the current needs of science and industry. Deploying the SWEBOK guide in improving the curriculum in undergraduate and graduate programs in Ecuador.

Analyze the skills, abilities, competencies of Software Engineering and the possible application in the professional profiles.

Analyze the professionalism and code of ethics of the Software Engineering to improve the ontological model.

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