



Aligning the COBIT and ITIL Frameworks Into an Academic Science Education Curricula

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Abstract

In this paper a COBIT and ITIL frameworks are discussed as a part of IT academic courses at the Faculty of Natural Sciences and Mathematics (FNSM), Republic of Macedonia. FNSM develops unique and professional standards into the higher education. It offers modern faculty premises and facilities with state-of-the-art IT infrastructure, research and academic collaboration with Universities around the globe and affiliation with many industry partners. COBIT is a proven set of standardized processes that businesses can use to ensure that information technology is effectively and securely integrated with business goals. COBIT is a framework and a knowledge base for IT processes and their management. The IT Infrastructure Library (ITIL) is a set of books comprising an IT service management Best Practices framework.

These two frameworks are worldwide recognized for professional certification. Aligning COBIT and ITIL courses with academic subjects, makes these frameworks understandable to students and prepares them to successfully attend professional COBIT and ITIL courses and take the COBIT and ITIL Certificates. This paper presents our experiences into aligning the COBIT and ITIL frameworks in academic science education curricula at the Faculty of Natural Sciences and Mathematics.

1. Introduction

There are several methodologies, standards, tools, frameworks and good practices for managing information technology. The most applicable and used today are ISO/IEC 27002, COBIT and ITIL [1],[2],[3]. Each has its positive aspects and its limitations. COBIT and ITIL have been used by information technology professionals in the IT service management (ITSM) space for many years. Used together, COBIT and ITIL provide guidance for the governance and management of IT-related services by enterprises.

IT governance is a structure of relationships and processes. It helps achieve business goals by adding value, balancing risks and gaining returns of investments. IT governance comprises: principles (responsibility, accountability, activities); internal and external stakeholders (suppliers, customers, general public, users, governments); scope (strategic alignment - aligning IT with business, value delivery, risk management, resource management, performance management) [4].

The Control Objectives for Information and related Technology (COBIT) is a set of best practices (framework) for information technology (IT) management created by the Information Systems Audit and Control Association (ISACA), and the IT Governance Institute (ITGI) in 1996 [5], [6], [7], [8].

COBIT provides managers, auditors, and IT users with a set of generally accepted measures, indicators, processes and best practices to assist them in maximizing the benefits derived through the use of information technology and developing appropriate IT governance and control in a company.

The IT Infrastructure Library (ITIL) is a set of books comprising an IT service management Best Practices framework [1]. ITIL is created by and for the British government, later expanded for use in all organizations. It gives a detailed description of important IT practices, with comprehensive checklists, tasks, procedures and responsibilities.

COBIT and ITIL are even used in academic programs for learning graduate students the principles of governing IT in organizations [9],[10].

2. The COBIT Framework

The Control Objectives for Information and related Technology (COBIT) is a framework for information (IT) management risks created by the Information Systems Audit and Control Association (ISACA), and the IT Governance Institute (ITGI). COBIT, provides managers, auditors, and IT users with a set



of generally accepted information technology control objectives to assist them in maximizing the benefits derived through the use of information technology and developing the appropriate IT governance and control in a company. COBIT is a proven set of standardized processes that businesses can use to ensure that information technology is effectively and securely integrated with business goals [2], [3], [6].

COBIT was developed by the IT Governance Institute and the Information Systems Audit and Control Foundation in 1992. The first edition was published in 1996; the second edition in 1998; the third edition in 2000, and the first on-line edition became available in 2003. In 2005, the fourth edition was initially released. COBIT 5 was released in June 2012. In December 2012, one add-on document was released, COBIT 5 for information security. In June 2013, a second add-on document was released, COBIT 5 for assurance.

Managers, auditors, and users benefit from the development of COBIT because it helps them understand their IT systems and decide the level of security and control that is necessary to protect their companies' assets through the development of an IT governance model.

ISACA offers following COBIT basic courses:

- COBIT Foundation Course, consisting of 3 days classroom training course or 18 hour online training
- COBIT Foundation Certificate, the exam is consisting of 50 multiple-choice questions and requires a score of 50% or higher to pass. Exam duration is 40 minutes. There are no mandatory pre-requisites for the exam.

3. The ITIL Framework

The Information Technology Infrastructure Library (ITIL) is the de facto global standard for IT services management. ITIL provides comprehensive technical documentation and best practices for planning, provisioning, and supporting IT processes and services. Enterprise IT executives put a high value on such best practice frameworks.

The ITIL is a set of books comprising an IT service management Best Practices framework [2], [3], [6]. ITIL is created by and for the British Government, later expanded for use in all organizations. It gives a detailed description of important IT practices, with comprehensive checklists, tasks, procedures and responsibilities. And can be tailored to any IT organization. IT service providers use ITIL concepts and practices to: Increase satisfaction of customers; IT services, Enhance communication with customers; Achieve higher reliability in mission-critical systems and infrastructure; Improve the cost/benefit of services; Create a "common sense" among staff.

The IT Service Management Forum (itSMF) is an independent and internationally-recognized forum for IT Service Management professionals worldwide. The itSMF is concerned with promoting ITIL, Best Practice in IT Service Management and has a strong interest in the International ISO/IEC2000 standard. ITIL contains a series of statements defining the procedures, controls and resources that should be applied to a variety of IT – related processes.

Since July 2013, ITIL has been owned by AXELOS Ltd, a joint venture between HM Cabinet Office and Capita Plc. AXELOS licenses organizations to use the ITIL intellectual property, accredits licensed Examination Institutes, and manages updates to the framework.

The ITIL best practices are currently detailed within five core publications: ITIL Service Strategy, ITIL Service Design, ITIL Service Transition, ITIL Service Operation, ITIL Continual Service Improvement.

The ITIL Qualification Scheme provides a modular approach to the ITIL framework, and is comprised of a series of qualifications focused on different aspects of ITIL best practice. The scheme is consisting of the following levels: Foundation Level, Practitioner level, Intermediate level, Expert level and Master level.

The exam is consisting of 40 multiple-choice questions and requires a score of 65% or higher to pass. Exam duration is 60 minutes.

4. The undergraduate academic IT curricula at Faculty of Natural Sciences and Mathematics (FNSM)

At the Faculty of Natural Sciences and Mathematics (FNSM), Ss. Cyril and Methodius University, Skopje, Republic of Macedonia exists 2 IT undergraduate educational professional modules (Internet and mobile technologies and Computer networks administration), 4 IT undergraduate educational academic modules (Software engineering, Computer Architectures and Networks, Information



Systems and Informatics education) and 2 IT science and informatics undergraduate educational academic modules (mathematics-informatics and Physics of Computer Hardware). All these modules produce Bachelor of Science degrees.

FNSM develops unique and professional standards in the Macedonian higher education. The general FNMS development premise is: No academic programme can stand alone. It is important to form value-added alliances in a number of areas that include other academic programs, top management from leading corporations in industry, and trade associations.

Following our experience of aligning COBIT and ITIL frameworks into IT academic education at MIT University, Skopje, Republic of Macedonia [9] starting from 2012 we aligned these two frameworks into IT academic education at FNSM, Skopje, Republic of Macedonia. The ITIL framework completely has been introduced into ICT management subject in the third semester, and COBIT framework partially into a Software engineering subject in the fourth and sixth semester, and partially (only for students of the Software engineering module) in a Software quality subject in the eight semester.

In the first year (2012/2013) around 60% of the students were prepared to attend ITIL Foundation Course and take the certificate. This percentage could be higher if ICT management Subject was at least in the fifth semester (not in the third semester). The next two years (2013/2014 and 2014/2015) situation became better after involvement of some changes into curricula (more additional material and homework assignments for the ITIL frameworks). The percentages of the students prepared to attend the ITIL Foundation Course and take the certificate was 83% and 91% respectively. Without involved changes into teaching methodology the third semester teaching of ITIL was too early for the students to successfully connect this experience with the theory and practice of the subjects in the first and second semester.

Aligning COBIT Foundation Course into Software engineering subject in fourth semester for the students of professional IT modules showed that they were not well prepared and did not showed satisfactory results (only 36% of the students were prepared to successfully attend COBIT Foundation Course and take the COBIT Foundation Certificates). Next two years (2013/2014 and 2014/2015) some changes of the teaching methodology has been done (were developed more additional materials and given to the students more excersises and homeworks). The perenteges of the students prepared to successfully attend COBIT Foundation Course and take the COBIT Foundation Certificates incrieded to 67% and 82% respectively. The best percentages (93% and 96% respectively) of the students were prepared to successfully attend COBIT Foundation Course and take the COBIT Foundation Certificates for the studnets of Software engineering module where the materials of the COBIT Framework were teaching in the eight semestar. These students were fully prepared succesfully to connect the COBIT Framework experience with the theory and practice of the subjects in the previous semesters.

5. Conclusion

COBIT is a proven set of standardized processes that businesses can use to ensure that information technology is effectively and securely integrated with business goals. COBIT is a framework and a knowledge base for IT processes and their management. The IT Infrastructure Library (ITIL) is a set of books comprising an IT service management Best Practices framework. These two frameworks are worldwide recognized for professional certification.

Aligning these frameworks with IT academic courses can move forward the students in understanding and preparing them to successfully attend professional COBIT and ITIL courses and take the COBIT and ITIL Certificates.

After aligning the COBIT and ITIL frameworks (Foundation levels) into an academic science education curricula at FNSM we could conclude that aligning these frameworks in third semester courses is too early for the students to successfully connect this experience with the theory and practice of the subjects in the first and second semester. Better results were obtained where ITIL and COBIT frameworks were aligned with fourth and sixth semester courses and when more additional material and homework assignments for the ITIL and COBIT frameworks were introduced. Teaching the COBIT framework in eight semester course gave the best results and even without introducing more additional material and homework assignments. These students were fully prepared succesfully to connect the COBIT Framework experience with the theory and practice of the subjects in the previous semesters.



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