

작은 조직을 위한 시스템 및 SW 엔지니어링 표준 및 실습

● 단기강좌 목적

- 4차 산업혁명 시대의 디지털 트랜스포메이션으로 가상 공간, 물리 공간, 사회 공간의 경계가 희석되는 신개념의 복합시스템이 등장할 것이며 심화된 복잡성의 문제해결을 위한 SW 엔지니어링 역량의 중요성이 증대되고 있음.
- 대형시스템에 주로 적용되었던 시스템엔지니어링 표준의 SW 엔지니어링 표준과의 통합이 진행되었고, 특히 중소기업의 95% 이상을 차지하는 작은 조직에 적용 가능한 가볍고 빠른 통합 표준이 필요함에 따라 2011년 국제표준(ISO/IEC 29110) 개발 워킹그룹이 발족되었음.
- 현재, 개발 워킹그룹 팀리더이며 Software Quality Assurance(SQA) 저자인 캐나다 몬트리올 대학의 Laporte 교수를 모시고, 국내 시스템 및 SW 엔지니어링 관련 기관과 기업의 SW 품질보증과 신뢰성 확보를 위한 국제표준(ISO 29110) 기반 프로세스의 보급 및 관심 저변확대를 위하여 한국시스템엔지니어링학회가 주최하고 SE Technology가 주관하는 본 단기강좌를 개설함.

● 커리큘럼

일 정	시 간	프로그램	교 육 내 용
1일 차 (11.29)	10:00~11:20	세미나 1	- 시스템 및 SW 엔지니어링 표준 및 가이드 개요 및 성과 - 표준개발 배경 및 4단계 로드맵 소개 - 표준, 관리 및 엔지니어링 가이드, 적용 - 멕시코 등 적용사례 및 성과
	11:30~12:50	세미나 2	- 제한된 비용과 일정 하에서 고품질 SW를 개발하기 위해 작은 조직에게 필요한 것은 무엇인가? - SW 개발 위험관리 및 국제표준(ISO 29110) 필요성 - SW 품질보증(SQA: Software Quality Assurance) 개론
	13:00~14:00	중 식	
	14:00~17:00	세미나 3	- ISO 29110 표준 기반 SW 품질보증 및 교육절차 개선 - 작은 조직의 현황과 문제점 - 표준 및 가이드 기반 SW 품질보증(SQA) - SQA 교육과정 및 19개국 교육절차 개선
2일 차 (11.30)	10:00~12:50	워 크 쉘	- 작은 조직을 위한 ISO 29110 표준 및 가이드 개발과 시스템 및 SW 엔지니어링 프로세스 적용 실습 - ISO 29110 표준 및 가이드 개발 현황 - 손쉬운 적용을 위한 전개 패키지 교육 - 가상 SW개발 과제(rice cooker) 실습 - 과제관리 프로세스 실습(일부) - SW 구현 프로세스 실습(no coding)
	13:00~14:00	중 식	
	14:00~17:00	워 크 쉘	

● 강 사 소 개

Dr. Claude Y. Laporte has been a Professor since 2000 at the École de technologie supérieure (ÉTS), a 11,000-student engineering school, where he teaches software engineering. His research interests include software process improvement in small and very small enterprises, as well as software quality assurance. He has worked in defence and transportation enterprises for over 20 years. He received a Master's degree in Physics from the Université de Montréal, a Master's degree in Applied Sciences from the École Polytechnique de Montréal and a Ph.D. from the Université de Bretagne Occidentale (France). He was awarded an honorary doctorate by the Universidad de San Martín de Porres (Peru) in 2013.



He is the Project Editor of the ISO/IEC 29110 series of systems and software engineering life cycle standards and guides developed specifically for Very Small Entities. He is the Co-chair of the INCOSE Systems Engineering for Very Small Entities WG. He is a member of INCOSE and life member of IEEE. He has been a member of the professional association of engineers of the Province of Québec. He is the co-author of two French books on software quality assurance published in 2011 by Hermes Science-Lavoisier and one English textbook, on the same topic, published by John Wiley and Sons in 2018. Dr. Laporte is a co-author of a French book, published in 2017, targeted at managers of small systems engineering organizations.

Web site address: <http://profs.etsmtl.ca/claporte/English/index.html>

Software Quality Assurance English textbook:

<http://ca.wiley.com/WileyCDA/WileyTitle/productCd-1118501829.html>

Systems engineering French book:

<http://www.cepadues.com/livres/les-cles-ingenierie-des-systemes-9782364935976.html>

● 세 미 나 1

The ISO/IEC 29110 Systems and Software Engineering International Standards and Guides for Very Small Entities – Overview and Accomplishments

Professor Claude Y Laporte, M.Sc., M.Sc. A., Ph.D.
Lead Editor of ISO/IEC 29110 Series

Very Small Entities (VSEs), i.e. enterprises, organizations (e.g. public or non-profit organization), projects or departments having up to 25 people, are very important to the economy. However, it has been established that VSEs often do not utilize existing systems and software engineering standards. To address the needs of VSEs, a set of international standards and guides, the ISO/IEC 29110 series, has been developed by experts in many countries. ISO/IEC 29110 is targeted at VSEs developing software products or systems typically composed of hardware and software components. The ISO/IEC 29110 provides a four-stage roadmap to VSEs, ranging from start-ups to well-established organizations.

We present the set of ISO/IEC 29110 standards and management and engineering guides and their implementations in start-ups and in larger software organizations in Mexico and internationally. Then, the implementation of the new ISO/IEC 29110 for systems engineering is briefly presented. We present the business benefits of ISO/IEC 29110 for VSEs, their customers and their employees. We will briefly discuss the teaching of ISO/IEC 29110 at the undergraduate and graduate levels in Mexico and internationally. Finally, the future developments of ISO/IEC 29110, such as standards and guides for the space domain, are presented.

● 세 미 나 2

What is needed by Small Organizations to Develop Quality Software within Budget and Schedule?

Professor Claude Y Laporte, M.Sc., M.Sc. A., Ph.D.
Lead Editor of ISO/IEC 29110 Series

Failure to deliver a quality software product on time and within budget threatens the survival and the competitiveness of software development organizations and impact their customers. One way to mitigate these risks is by having software development organizations to put in place recognized software quality assurance practices.

In many organizations, Software Quality Assurance (SQA) is a synonym for testing. SQA covers a wide spectrum of software engineering practices to provide a level of confidence that the software developed will meet the requirements of the customer and will be delivered within schedule and budget.

Very Small Entities (VSEs), organizations with up to 25 people, are very important to the worldwide economy. However, it has been established that VSEs often do not utilize existing systems and software engineering standards. To address the needs of VSEs, a set of international standards and guides, the ISO/IEC 29110 series, has been developed by experts in many countries. The ISO/IEC 29110 series, such as the management and engineering guides, is targeted at VSEs developing software products or systems that are typically composed of hardware and software components. The ISO/IEC 29110 provides a four-stage roadmap to VSEs ranging from start-ups to well-established organizations.

An overview of SQA and ISO/IEC 29110 will be presented to enable managers, customers, suppliers, developers, auditors, SQA personnel, professors and students to motivate them in learning and applying Software Quality Assurance and ISO/IEC 29110.

Teaching process improvement and software quality assurance with the ISO/IEC 29110 Standards and Guides for Very Small Entities

Professor Claude Y Laporte, M.Sc., M.Sc. A., Ph.D.
Lead Editor of ISO/IEC 29110 Series

Very Small Entities (VSEs), i.e. enterprises, organizations (e.g. public or non-profit organization), projects or departments having up to 25 people, are very important to the economy. However, it has been established that VSEs often do not utilize existing systems and software engineering standards. To address the needs of VSEs, a set of international standards and guides, the ISO/IEC 29110 series, has been developed by experts of many countries. ISO/IEC 29110 is targeted at VSEs developing software products or systems typically composed of hardware and software components. The ISO/IEC 29110 provides a four-stage roadmap to VSEs, ranging from start-ups to well-established organizations.

We present the set of ISO/IEC 29110 standards and management and engineering guides and their implementations in start-ups and in larger organizations. Then, the implementation of the new ISO/IEC 29110 for systems engineering is briefly presented. We present the business benefits of ISO/IEC 29110 for VSEs, their customers and their employees.

Since the ISO/IEC 29110 engineering and management guides are easily understandable and freely available, it has greatly helped their adoption. More than 19 countries, such as Canada, Colombia, Brazil, Haiti, Jordan, Malaysia, Mexico, Peru, Thailand and United States are teaching the ISO/IEC 29110. A few universities have also obtained an ISO/IEC 29110 certification. The ISO/IEC 29110 has been used by many students to develop their first products.

Process improvement could be taught in lecture format and with a 10-week implementation project in an organization by teams of graduate students. The SPI course is taught using a 'problem-goal-solution' approach where students learn that any process improvement initiative must be based on issues preventing an organization in achieving its organizational goals whether the organization is a company or a not-for-profit organization. Since a large percentage of students attending the process improvement course are working in small settings or in small projects of a large organization, the emphasis on the use of the CMMI[®] was gradually reduced to switch to the ISO/IEC 29110. An important aspect of this course is the management of technological change where students learn and put in practice in their project the 'soft' issues which are part of most SPI organizational initiatives.

Software quality assurance (SQA) could be taught in the undergraduate and graduate software engineering curricula. A typical course includes a 10-week project in which teams of students apply the SQA practices taught in class in a software development project. The ISO/IEC 29110 standard and the management and engineering guides have been used for the project. Throughout the 10-week project, student-teams collect measures, such as the number of defects and the rework effort, and the performance of each team is analyzed. This analysis allows discussion to take place on the impacts of SQA practices as a way to support the development of quality software on time and within budget.

We will present a few projects conducted in organizations with the ISO/IEC 29110 by graduate students that are employees of the organization.

ISO/IEC 29110 Systems and Software Engineering Standards and Guides for Very Small Entities Workshop

Overview and Implementation in a Mini project

Presenter

Dr. Claude Y Laporte
Professor at the École de technologies supérieures, Montréal, Canada
Lead Editor of the ISO/IEC 29110 series

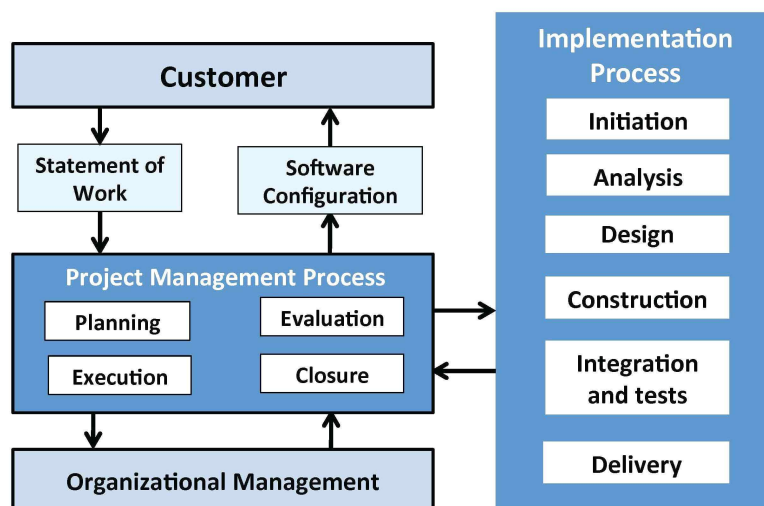
Description of the Workshop

Very Small Entities (VSEs) are enterprises, departments or projects having up to 25 people. VSEs, involved in software development, are very important to the world economy. Failure to deliver a quality product on time and within budget threatens the competitiveness of organizations of all sizes. One way to mitigate these risks is by having VSEs to put in place recognized software engineering practices. Many international standards and models, like the ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288, that have been developed to capture proven engineering and management practices. However, they were not designed having in mind the needs and expertise of VSEs. They are consequently difficult to apply in such settings.

An ISO/IEC JTC1/SC7 Working Group, Working Group 24, was established in 2005 to address these difficulties by developing the ISO/IEC 29110 Engineering standards and guides that are specifically tailored to the needs of VSEs. The first set of ISO/IEC 29110 standards and guides were published in 2011 for VSEs developing software. Since 2011, Working Group 24 has also developed a set of standards and guides for VSEs involved in the development of systems. Systems, in the context of ISO/IEC 29110, are typically composed of hardware and software components.

In this workshop, we present the development of ISO/IEC 29110 standards and guides. This workshop also presents the set of tools, such as the Deployment Packages, developed to facilitate and accelerate the implementation of ISO/IEC 29110.

During the workshop, participants will learn ISO/IEC 29110 by conducting a fictitious software development project of a rice cooker by applying the activities and tasks of the project management process and the software implementation process of the Basic profile of ISO/IEC 29110 as illustrated in the figure below.



Project Management and Software Implementation Processes

The objectives of the workshop are:

- Use the activities of the Project Management process to plan, execute, evaluate and close the rice cooker project
- Use the activities of the Software Implementation process to simulate the development of the software

During the workshop, there not enough time to develop all the documents of the Basic profile. As an example, no code will be developed.

ISO/IEC JTC 1/SC7 stands for the International Organization for Standardization/International Electrotechnical Commission Joint Technical Committee 1/Sub Committee 7, which is in charge of the development and maintenance of software and systems engineering standards.