



Engineering for Industry  
Department of Software and IT Engineering



# The Development of a Set of Tools to Facilitate the Adoption and the Implementation of the ISO/IEC 29110 Standard by Very Small Entities

**Professor Claude Y Laporte, Eng., Ph.D.**

**Project Editor, ISO/IEC JTC1 SC7 Working Group 24**

**RIOSOFT 2011, Rio de Janeiro, Brazil**

**September 29<sup>th</sup> 2011**



# Content



- **Introduction**
- **Needs for Standards for Very Small Entities (VSEs)**
- **Approach used to develop the ISO/IEC 29110 Standard**
- **Survey of VSEs**
- **Network of VSE Support Centers**
- **Deployment Packages**
- **Pilot Projects**
- **Development of Profiles in Systems Engineering**
- **Next Steps**

**VSEs** = Very Small Entities are enterprises, projects or departments having up to 25 people.

**ISO/IEC JTC 1/SC7** = International Organization for Standardization/  
International Electrotechnical Commission Joint Technical Committee  
1/Sub Committee 7.

# École de Technologie Supérieure (ETS)

Over 5400 students, 130 professors, 24 general senior lecturers.

About 2000 **paid** industrial internships in over 800 companies each year (about 10,000\$ per internship)

## Undergraduate Programs

- **Software Engineering**
- **IT Engineering**
- **Construction Engineering**
- **Production Engineering**
- **Electrical Engineering**
- **Mechanical Engineering**
- **Logistics and Operations Engineering**

- 650 students
- **19 Professors** in the department have a mean industrial **experience of 10 years.**

## Graduate Programs

- **Software Engineering**
- **Information Technology**
- **Other programs**

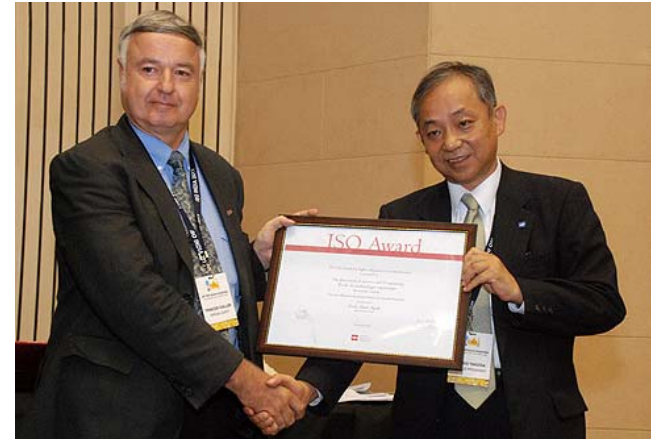
150 students.





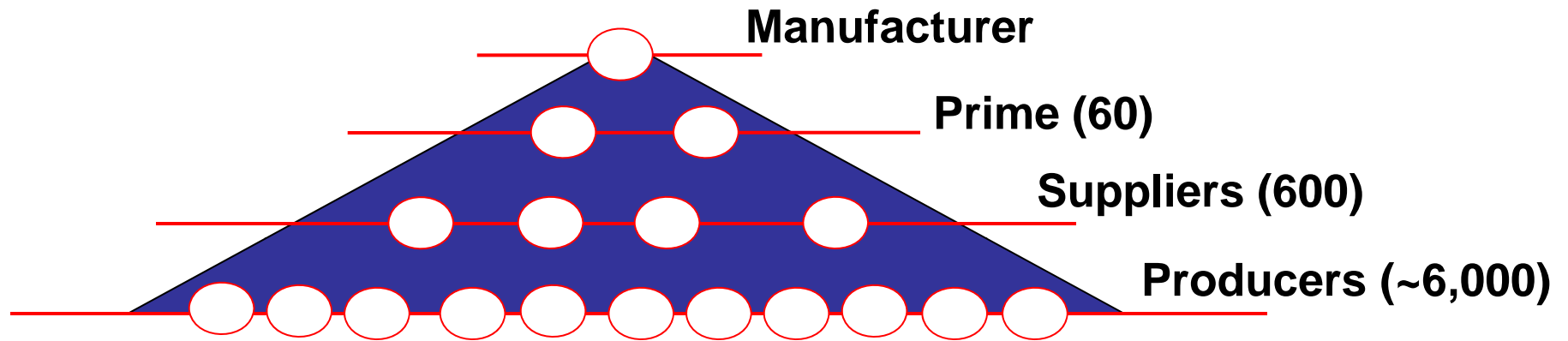
# Software and IT Engineering Department of ETS Won the 2011 ISO Award for Higher Education in Standardization

- The award was presented at the ISO General Assembly in India, September 21-23.
- ETS was one of eight finalists.
- The selection committee was particularly impressed by:
  - The integration of standardization aspects into conventional disciplines such as IT and software engineering.
  - The inclusion of standards in engineering subjects such as software quality assurance, maintenance and testing by experienced professors who participate in the work of technical committees and subcommittees
  - The publications related to the course could serve to provide insights to other institutions wishing to go the same way.



# The Importance of VSEs

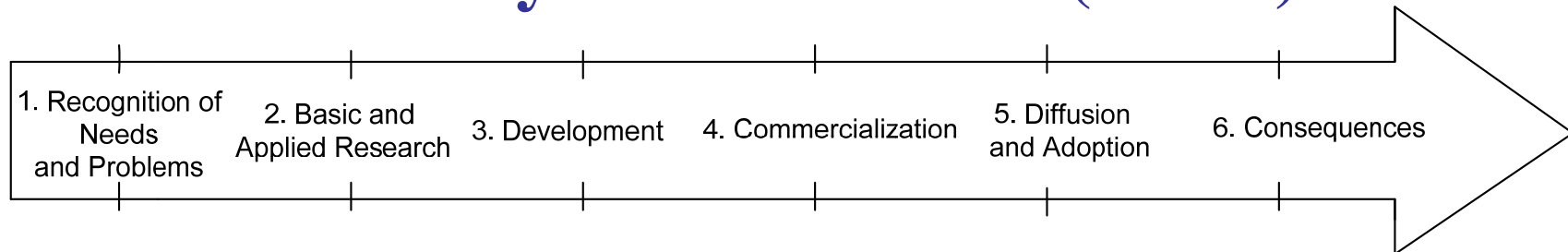
## An Example from Japan



A software defect from one of the producers went into a product and resulted in a loss of over \$200 million by the manufacturer

Adapted from: Shintani, Small Settings Workshop, Software Engineering Institute, 2005

# Development of ISO/IEC 29110 Standard for Very Small Entities (VSEs)



- **Phase 1 - Recognition of Needs and Problems.**
  - Began in Australia at an ISO Plenary meeting (2004)
- **Phase 2 - Basic and Applied Research**
  - Survey of Process Improvement Initiatives (2005)
  - Survey of VSEs worldwide (2006)
- **Phase 3 - Development**
  - The Development of International Standards for VSEs (2006 - 2010)
- **Phase 4 – Commercialization (2010)**
- **Phase 5 - Diffusion and Adoption**
  - Development of the Means to Accelerate the Adoption and Utilization of International Standards by VSEs (2006 - )
- **Phase 6 - Consequences (2011 - )**

(Rogers, 2003)

# Use of Software Engineering Standards by VSEs

## Our Hypothesis in 2005

- **Reasons for not using Software Engineering (SE) Standards**
  - Not written for or difficult to use by VSEs,
  - Current SE standards do not specifically address VSEs' needs,
  - Current SE standards requires critical mass (staff, budget, time) to implement,
  - Compliance with existing standards difficult to achieve,
  - Net benefits of using SE standards not obvious,
  - Most VSEs do not have the expertise to implement standards.
- **Benefits of Use** (but not seen by VSEs)
  - Reduction of risk (business, cost, schedule, quality),
  - Enables measurement of productivity and quality,

Standards were often developed by large organisations for large organisations !

## Survey of VSEs in 2006

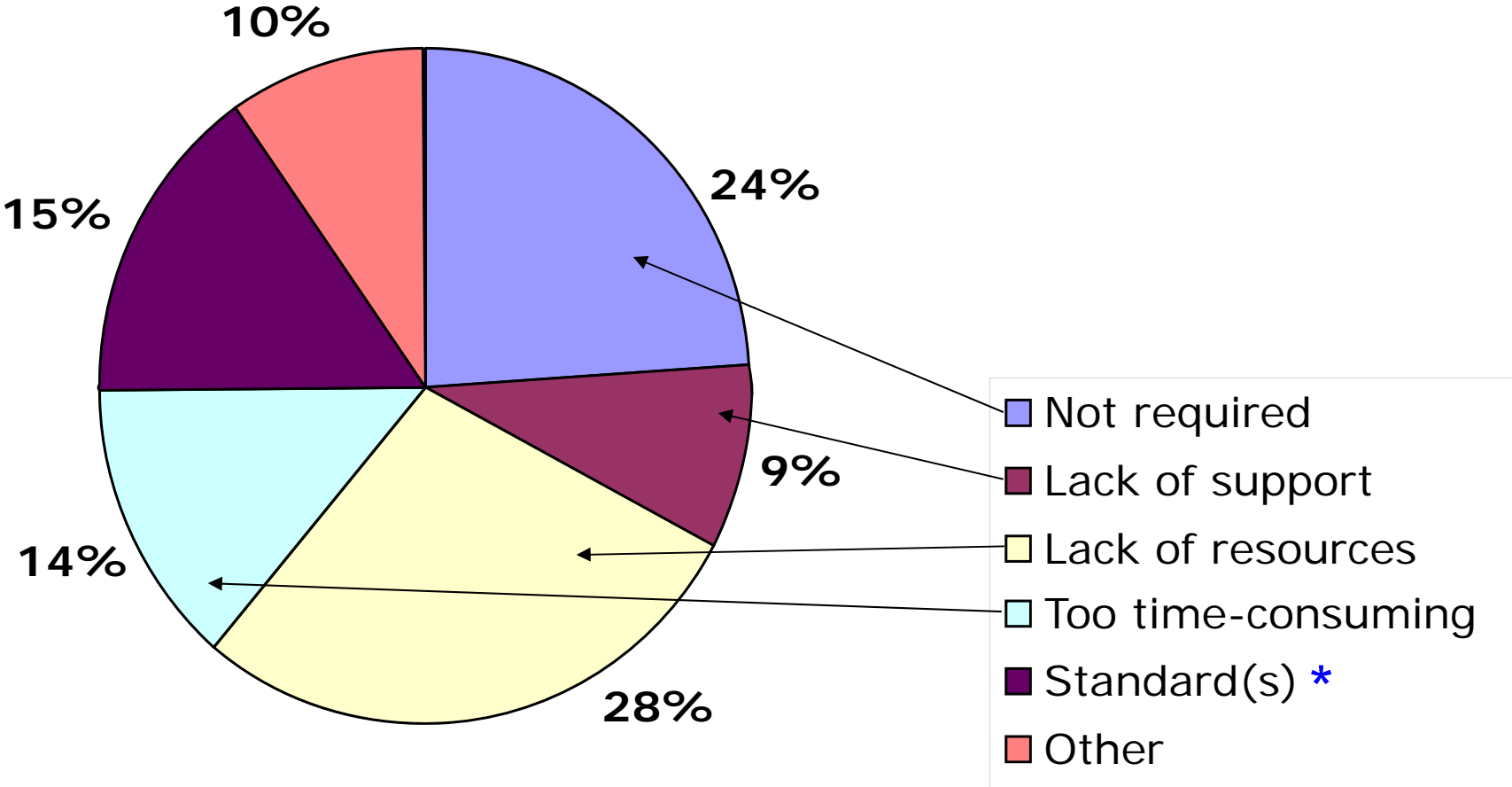
- **Objectives**
  - Identify VSEs' utilization of standards
  - Identify problems and potential solutions to help VSEs apply standards and become more capable and competitive.
- **Method**
  - Web-based Survey
  - Questionnaire translated in 9 languages
    - English, French, German, Korean, Portuguese, Russian, Spanish, Thai and Turkish.
  - Invitation to participate in survey widely broadcasted via:
    - WG 24 Network of contacts
    - Centers and initiatives focused on SMEs/VSEs
      - e.g., SIPA (Thailand), CETIC (Belgium), Parquesoft (Colombia)



## Over 435 Responses from 32 Countries

Country	Number of Responses	Country	Number of Responses	Country	Number of Responses
Argentina	2	Finland	13	New Zealand	1
Australia	10	France	4	Peru	4
Belgium	10	Germany	1	Russia	4
Brazil	72	India	57	South Africa	10
Bulgaria	3	Ireland	10	Spain	4
Canada	10	Italy	2	Taiwan	1
Chile	1	Japan	3	Thailand	59
Colombia	109	Korea (South)	4	Turkey	1
Czech Republic	3	Luxembourg	3	United Kingdom	2
Dominican Republic	1	Mexico	20	United States	3
Ecuador	9	Morocco	1		

# Why VSEs don't Use Standards?

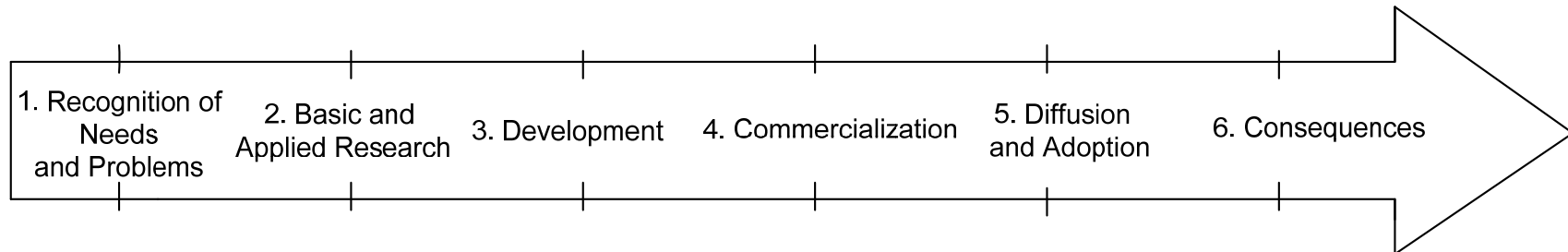


\* Difficult, Bureaucratic, not enough guidance.

## Requests from VSEs

- **Certification and Recognition**
  - Only 18% of VSEs were certified
    - Over 53% of larger companies were certified
  - Over 74% indicated that it was important to be either recognized or certified
    - ISO certification requested by 40%.
    - Market recognition requested by 28%
    - Only 4% are interested in a national certification
- **Needs Regarding Documentation**
  - 62% of VSEs were asking for more guidance and examples
  - 55% were requiring 'lightweight' standards that are easy to understand and apply and come with templates

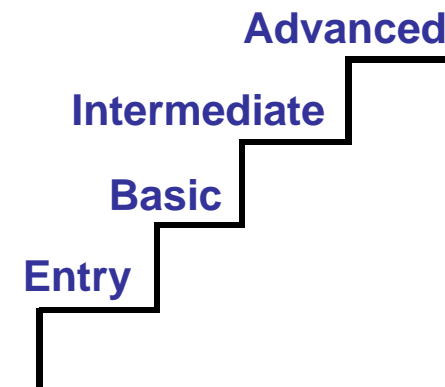
# Agenda



- **Phase 1 - Recognition of Needs and Problems (2004).**
- **Phase 2 - Basic and Applied Research (2005-2006)**
- **Phase 3 - Development**
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- **Phase 6 - Consequences (2011 - )**

## The Generic Profile Group\*

- **Four Profiles within the Generic Profile Group**
  - **Entry** - Targets VSEs typically developing 6 person-month projects or start-up VSEs;
  - **Basic** - Targets VSEs developing only one project at a time;
  - **Intermediate** – Targets VSEs developing multiple projects within the organizational context;
  - **Advanced** – Targets VSEs which want to sustain and grow as an independent competitive software development business.



\* VSEs that do not develop critical software products

# Documents Targeted by Audience

29110 Overview (TR 29110-1)

For VSEs

29110 Profiles (IS)

Framework and Taxonomy (IS 29110-2)

Specifications of VSE Profiles (IS 29110-4)

Specification - VSE Profile Group m  
(IS 29110-4-m)

For Standard  
producers, tool  
vendors, methodology  
vendors

List the Requirements  
i.e. 'What to do'

29110 Guides (TR)

Assessment Guide (TR 29110-3)

Management and Engineering Guide (TR 29110-5)

Management and  
Engineering Guide  
VSE Profile m-n  
(TR 29110-5-m-n)

For Assessors  
and VSEs

For VSEs

'How to do'

# ISO/IEC 29110 Part 5 – Table of Contents

**Foreword**

**Introduction**

**1. Scope**

**2. Normative references**

**3. Terms and definitions**

**4. Basic VSE profile management and engineering guide**

4.1 Introduction

4.2 Project Management (PM) process

4.3 Software Implementation (SI) process

4.4 Roles

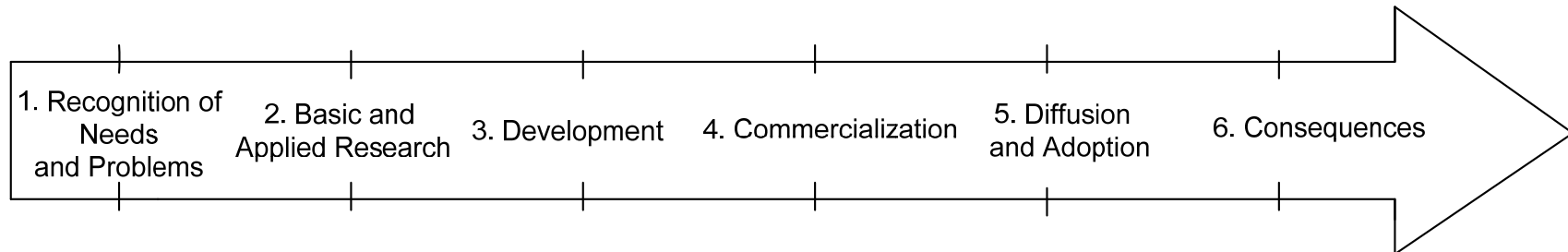
4.5 Product description

4.6 Software tools requirements

**Annex A (informative) – Deployment Package**

**Bibliography**

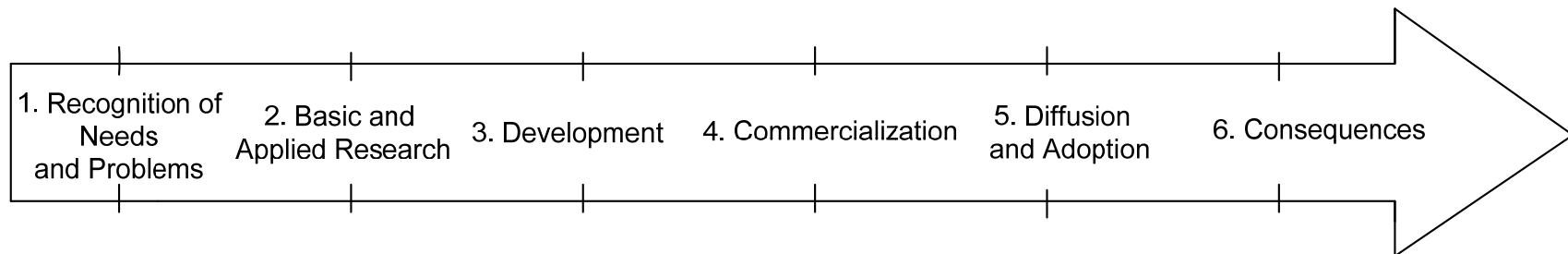
# Agenda



- **Phase 1 - Recognition of Needs and Problems (2004)**
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# Agenda



- **Phase 1 - Recognition of Needs and Problems (2004)**

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- **Phase 4 – Commercialization (2010)**

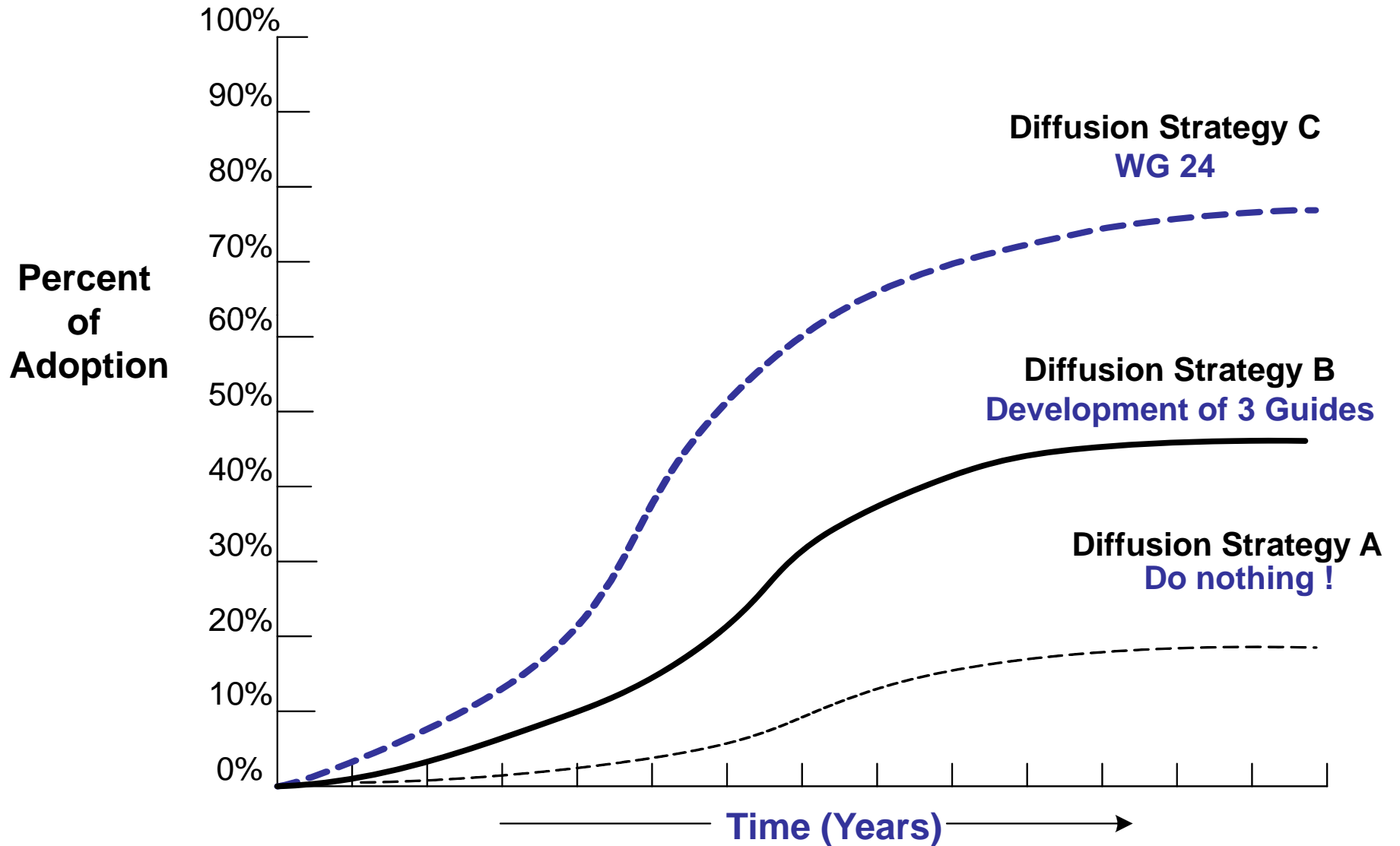
- **Phase 5 - Diffusion and Adoption (2006 - )**

- Development of the Means to Accelerate the Adoption and Utilization of International Standards by VSEs (2006 - )

- **Phase 6 - Consequences (2011 - )**

5. Diffusion

# Rate of Diffusion/Adoption



# Network of Support Centers for VSEs

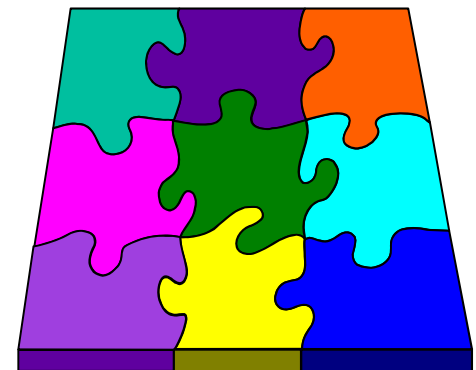
## • Main Objectives

- Accelerate deployment and implementation of ISO/IEC 29110 Standard
- Accelerate the development and application of Deployment Packages

- Belgium (Cetic)
- Brazil (RIOSoft) 
- Canada (ÉTS) 
- China (in discussion)
- Colombia (Parquesoft)
- Finland (Tampere University of Technology) 
- France (UBO)
- Haiti (in discussion) 
- Ireland (LERO)
- Japan (in discussion) 
- Luxembourg (Tudor Research Center)
- Mexico (UNAM) 
- Peru (in discussion)
- Thailand (Institute of Software Promotion for Industries)

## Deployment Packages (DPs)

- A set of artefacts developed to facilitate the implementation of a set of practices
  - Deployment packages are not intended to preclude or discourage the use of additional guidelines that VSEs find useful.
- Set of concrete steps to implement the Engineering and Management Guide.
- A VSE can implement its content, without having to implement the complete framework at the same time.



## Content of Deployment Packages

### 1. Technical Description

Purpose of this document

Why this topic is Important ?

### 2. Definitions

Generic Terms

Specific Terms

### 3. Relationships with ISO/IEC 29110 Part 5

### 4. Description of Processes, Activities, Tasks, Steps, Roles and Products

### 5. Template (s)

### 6. Example (s)

### 7. Checklist (s)

### 8. Tool (s)

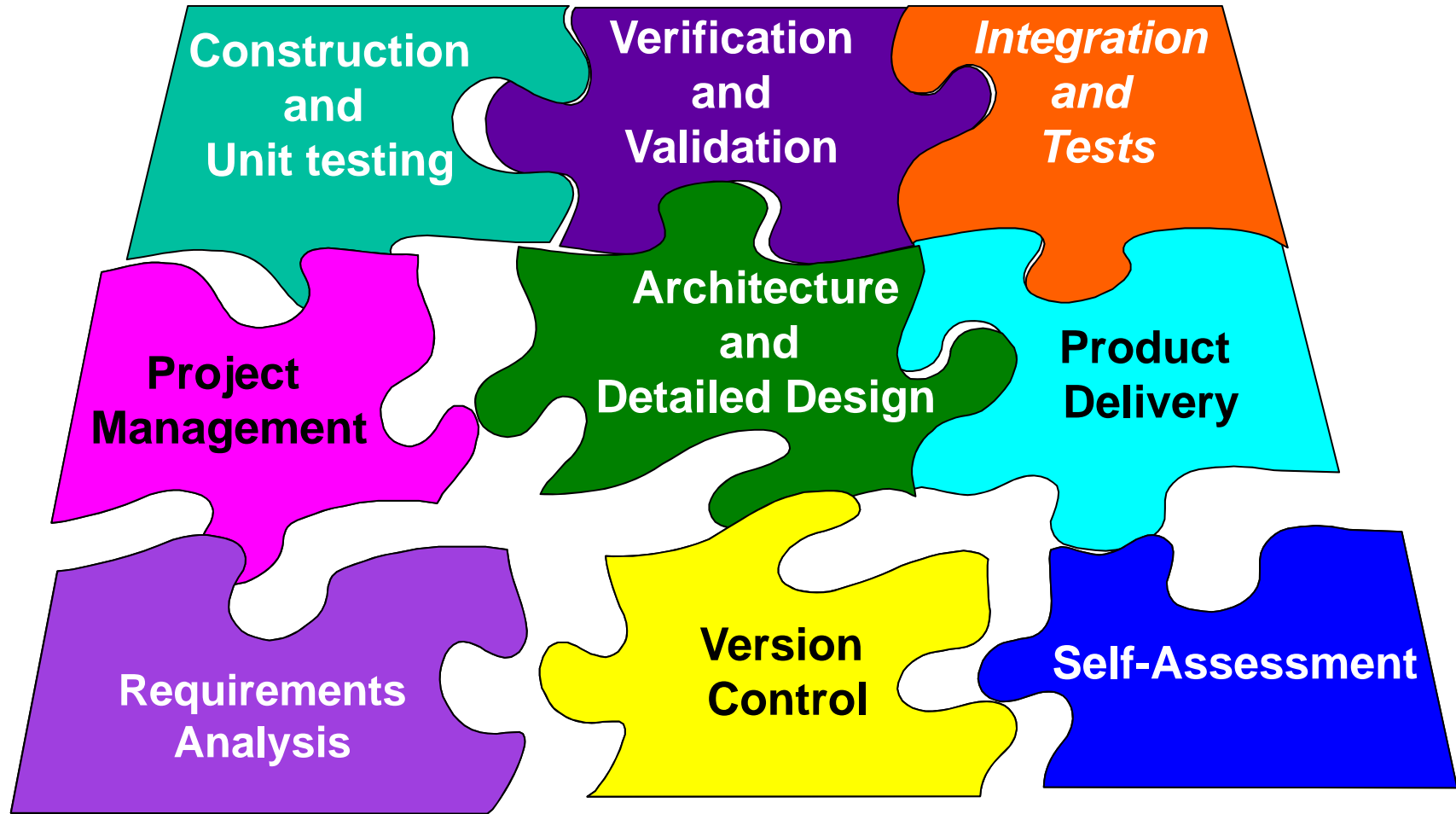
### 9. Reference to Standards and Models: ISO 9001, ISO/IEC 12207, CMMI

### 10. References

### 11. Evaluation Form

**Deployment Packages are free !**

# Deployment Packages for the Basic Profile



# Requirement Analysis Deployment Package

- **Activity covered** - Software Requirements Analysis

- **Task 1** - Requirements Identification

- **Steps**

- 1. Collect information about the application domain

- » During this Step, analyst captures the key concepts of the business domain of the customer. The customer assists the analyst by giving him all the information (existing documentation or explanation) that will facilitate this understanding.

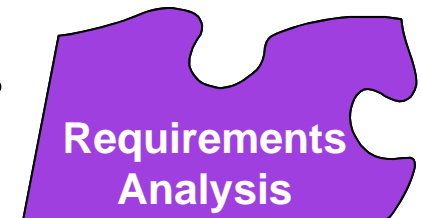
- 2. Identify project's scope

- 3. Identify and capture requirements

- 4. Structure and prioritize requirements

- Requirement Analysis [Traceability Tool](#)

- Requirement Analysis [Training Material](#)



# Eclipse Plug-in for the Engineering and Management Guide

The screenshot displays the Eclipse Process Framework Composer web application. The interface includes a top navigation bar with the application name and links for Feedback and About. A left sidebar contains a tree view with categories like Welcome, Disciplines, Roles, Products, Tasks, and Guidance. The main content area shows a 'Welcome' message and a 'Main Description' section. The 'Main Description' section contains the following text:

This is an implementation of the ISO/IEC 29110 Basic Profile. It is basically an experiment to try the Eclipse Process Framework (EPF) as a means to deploy the 29110 DPs in web format.

The Basic VSE Profile Management and Engineering Guide applies to a Very Small Entity (VSE) (enterprise, organisation, department or project up to 25 people) dedicated to software development. The project may fulfil an external or internal contract. The internal contract between the project team and its customer need not be explicit.

The Guide provides Project Management and Software Implementation processes which integrate practices based on the selection of ISO/IEC 12207- *Systems and Software Engineering — Software Life Cycle Processes:2008* and ISO/IEC 15289 *Systems and Software Engineering – Software Life Cycle Process – guidelines for the content of software life cycle process information products (documentation):2006* standards elements. Annex A provides information about Deployment Packages which will facilitate the implementation of these processes.

Using the Guide, VSE can obtain benefits in the following aspects:

- An agreed set of project requirements and expected products is delivered to the customer.
- A disciplined management process, that provides project visibility and corrective actions of project problems and deviations, is performed.
- A systematic software implementation process, that satisfies customer needs and ensures quality products, is followed.

To use the Guide the VSE needs to fulfil the following entry conditions:

- Project statement of work is documented;
- Feasibility of the project was performed before its start;
- Project team, including project manager, is assigned and trained; and
- Goods, services and infrastructure to start the project are available.

The purpose of the Project Management process is to establish and carry out in a systematic way the tasks of the software implementation project, which allows complying with the project's objectives in the expected quality, time and cost.

The purpose of the Software Implementation process is the systematic performance of the analysis, design, construction, integration and tests activities for new or modified software products according to the specified requirements.

PM process uses the customer's statement of work to elaborate the project plan. The PM project assessment and control tasks compare the project progress against the project plan and actions are taken to eliminate deviations or incorporate changes to the project plan. The PM project closure activity delivers the software configuration, produced by SI, and gets the customer's acceptance to formalize the end of the project. A project repository is established to save the work products and to control its versions during the



## Pilot Projects Completed in Canada

- **Building Maintenance Company**
  - VSE of 8 in Canada and 3 in France.
  - Will pilot verification practices : code review and requirements inspection
- **Insurance Company**
  - About 300 staffs.
  - QA department of 20
  - Will pilot configuration management practices
- **Security Company**
  - Develop security platforms
  - VSE of 29 employees
  - Will pilot requirements practices in the R&D group of 9 software developers
- **Web Site Development Company**
  - Develop internet sites
  - VSE of 25 employees
  - Will pilot test practices
- **Communications Company**
  - VSE of 25 employees spread in 2 cities
  - IT staff of 2
  - Will pilot requirements practices

\* In each team, one graduate student is a staff of the Organisation

## Pilot Projects Completed in Canada

- **Telecommunication Research Chair**
  - Implementation of ISO 29110 Draft Entry Profile process for Master and PhD students
  - Most projects are conducted by 1 graduate student



- **Research Laboratory in Medical Imagery and Orthopedic**
  - Implementation of ISO 29110 Draft Entry process for Master and PhD students
  - Most projects are conducted by 1 graduate student



## Education Interest Group

- Concept: Develop a set of Deployment Packages for Education
  - To help educators teach the future ISO standards for VSEs by developing and providing at no cost educational material,
  - To sensitize undergraduate and graduate students to the ISO standard for VSEs.
- Courses to Support ISO 29110 Standards and Technical Reports
  1. Introduction to ISO/IEC Software Engineering Standards (Ireland)
  2. Introduction to the ISO/IEC 29110 Standards, Technical Reports and Deployment Packages for VSEs (Canada)
  3. Development of a Software Engineering Process using ISO/IEC 29110 TR Part 5 – Engineering and Management Guide
  4. Software Development using ISO/IEC 29110 TR - Engineering and Management Guide (Czech Republic)
  5. Assessment of an ISO/IEC 29110-Based Software Process
  6. Conduct Deployment of ISO/IEC Standard in a VSE (Canada)

## 5. Diffusion

# A Public Web Site for ISO/IEC 29110

- Members of WG
- Introduction
- Survey of VSEs
- Network of Centers
- Deployment Packages
- Pilot Projects
- Education DPs
- Publications

Professor Claude Y. Laporte, eng., M. Sc., M. Sc. A. - Windows Internet Explorer

http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html

Google

Professor Claude Y. Laporte, eng., M. Sc., M. Sc. A.

Université du Québec  
École de technologie supérieure  
Génie logiciel et des technologies de l'information  
Professor Claude Y. Laporte M.Sc., M. Sc. A. Français

### Welcome to the Public Site of the ISO/IEC JTC1/SC7<sup>[1]</sup> Working Group 24

#### Life Cycle Processes for Very Small Entities (VSEs)

Industry recognizes very small entities (i.e. those with less than 25 people) for their contribution of valuable products and services. As software quality increasingly becomes a subject of concern, and as process approaches are maturing and earning the confidence of companies, the use of ISO/IEC JTC1/SC7 international standards is spreading in organizations of all sizes. However, these standards were not written for VSEs and are consequently difficult to apply in such settings. A new ISO/IEC JTC1/SC7 Working Group has been established to address these difficulties by developing profiles and providing guidance for compliance with ISO software engineering standards. A survey was conducted among very small entities on their utilization of standards, as well as to collect data to identify problems and potential solutions to help very small enterprises apply them.

<sup>[1]</sup> ISO/IEC JTC 1/SC7 stands for the International Organization for Standardization/ International Electrotechnical Commission Joint Technical Committee 1/Sub Committee 7

Professor Claude Y. Laporte's Home page

Université du Québec  
École de technologie supérieure  
Génie logiciel et des technologies de l'information

W3C HTML 4.01

Done Internet 100%

start 3 Windo... Inbox - Mi... Adobe Ac... 2 Micros... Fusion to... Professor ... 11:49 AM

<http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html>

## 29110 Public Web Sites

- **Belgium:** <http://www.cetic.be/rubrique370.html>
- **Brazil:** <http://www.netcenter4vse.org.br>
- **Canada:** [www.iso29110.ca](http://www.iso29110.ca) (*in construction*)
- **Finland:** <https://wiki.tut.fi/CoSE/VSE>
- **Ireland:** <http://www.lero.ie/project/iso29110>
- **Japan:** [www.vse.jp](http://www.vse.jp)
- **Thailand:** <http://www.center4vse.net/>

**One web site has been in operation since 2006 at ÉTS**  
<http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html>

# Papers and Communications

- Ribaud, V., Saliou, P., Laporte, C.Y., *Towards Experience Management for Very Small Entities*, International Journal On Advances in Software, 2011, vol 4, no 1&2
- Ribaud, V., Saliou, P., Laporte, C.Y., *Un assistant de mémoire pour les très petits projets d'ingénierie du logiciel*, Étude de Communication (ETC) N° 36, 2011
- O'Connor, Rory, V., Laporte, Claude, Y., [Using ISO/IEC 29110 to Harness Process Improvement in Very Small Entities](#), Euro SPI 2011, Roskilde, Denmark, June 27-29, 2011,
- O'Connor, Rory, V., Laporte, Claude, Y., [Deploying Lifecycle Profiles for Very Small Entities: An Early Stage Industry View](#), in R.V. O'Connor et al. (Eds.): SPICE 2011, CCIS 155, pp. 227–230, Dublin, Irlande, 30 mai-1 juin 2011.
- Laporte, C.Y., Alexandre, S., O'Connor, R., [A Software Engineering Lifecycle Standard for Very Small Enterprises](#), in R.V. O'Connor et al. (Eds.): EuroSPI 2008, CCIS 16, pp. 129–141,
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- Alexandre, S., Mäkinen, T., Varkoi, T., [Implementation of a Software Process Standard as an Electronic Process Guide](#), SPICE 2008 Conference, Nuremberg, May 26-28 2008.
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- Laporte, C.Y., April, A., Renault, A., [Applying ISO/IEC JTC 1/SC7 Software Engineering Standards in Very Small Enterprises](#), Crosstalk, Journal of Defense Software Engineering, February 2007, pp 29-30.
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- Laporte, C.Y., Renault, A., Alexandre, S., Uthayanaka, T. [The Application of ISO/IEC JTC 1/SC7 Software Engineering Standards in Very Small Enterprises](#), ISO Focus, International Organisation for Standardisation, September 2006, pp 36-38.



# Publications - Communications

- Elements of ISO/IEC 29110 are introduced in many chapters of 2 French textbooks on Software Quality Assurance
  - e.g. Chapter about standards, risks, reviews, etc.
- INCOSE Workshop (Phoenix, Arizona, Feb. 2011)
  - Presentation to Systems Engineers
- Project Management Institute (Montréal, April 2011)
  - Presentation to Project Managers
- French Association of Systems Engineers (Paris, May 24<sup>th</sup>)
- Book Chapter (Fall 2011)
  - Laporte, C.Y., Palza Vargas, E., The Development of International Standards to facilitate Process Improvements for Very Small Enterprises, Book: “Software Process Improvement and Management: Approaches and Tools for Practical Development” IGI Global Publisher. USA. 2011.



## Publications - Communications

- **ISO 29110 on Wikipedia**
  - English version
    - [http://en.wikipedia.org/wiki/ISO\\_29110:Software\\_Life\\_Cycle\\_Profiles\\_and\\_Guidelines\\_for\\_Very\\_Small\\_Entities\\_\(VSEs\)](http://en.wikipedia.org/wiki/ISO_29110:Software_Life_Cycle_Profiles_and_Guidelines_for_Very_Small_Entities_(VSEs))
    - Planned versions
      - Spanish, Portuguese
- **IEEE 730 Standard – Software Quality Assurance**
  - An annex was written about ISO 29110 standard
    - Description of VSE, needs.
    - Overview ISO 29110, profiles, processes.
    - Coverage of ISO 12207 SQA activities to 29110 Basic profile



# Technology Transfer Center for VSEs at the ÉTS

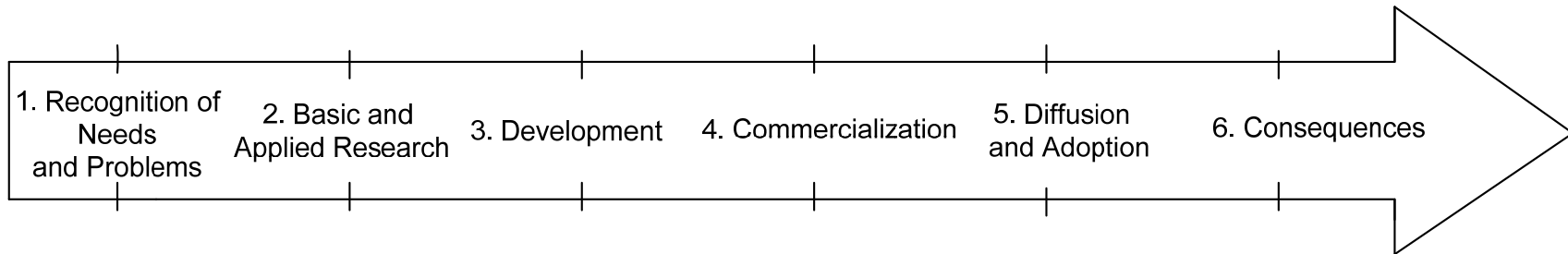
- **Mission**
  - To accelerate technology transfer to small and very small structures in Québec developing software products or software-based systems, or to provide IT services to make them more competitive, both at the national level and internationally, by developing and deploying software engineering practices tailored to their needs.
- **Objectives**
  1. Identify, promote, and disseminate best practices in software engineering and services for very small entities;
  2. Accelerate the process of technology transfer in software engineering for VSEs;
  3. Provide information and technical and strategic information to managers of VSEs, outsourcers, and Government of Québec agencies;
  4. Participate in the development of international standards for VSEs;
  5. Promote international standards for VSEs in Québec;
  6. Promote research in software engineering for VSEs;
  7. Promote training and development courses on ISO standards for VSEs.



# Thailand and APEC/ASEAN Countries

- **Thailand**
  - **Budget**
    - 1,000,000 \$ over 3 years
  - **Objectives**
    - ISO 29110 as a standard in Thailand within 2 years after publication by ISO
    - At least 10% growth rate of Thai industries especially a small size of entrepreneurs
    - Strengthen the ability of competitiveness of the Thai software industry
  - **Target**
    - 300 Thai VSEs assessed over 3 years
  - **Education**
    - Incorporate 29110 in undergraduate and graduate programs
- **APEC** (Asia-Pacific Economic Cooperation )/**ASEAN** (Association of Southeast Asian Nations, 10 countries)
  - 6 other countries are in the process of adopting ISO 29110

# Agenda



- **Phase 1 - Recognition of Needs and Problems (2004)**
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- **Phase 3 – Development (2006-2010)**
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- **Phase 6 - Consequences (2011 - )**

# Consequences

- Promoters of an innovation are often optimistic
  - Change agents and agencies tacitly assume that the consequences of innovations will be positive.
- Consequences of an innovation usually manifest themselves over extended periods of time (e.g. months, years)
- Possible consequences (undesirable, direct or indirect, anticipated or unanticipated) by:
  - **Imposing the standards** on all the VSEs in a country or on all a customer's VSEs
    - e.g. from a large enterprise or a government agency
  - **Motivating VSEs** to adopt the standards
    - Government support: Awareness, training, certification, etc.
  - **Not imposing the standards** on VSEs (*laissez-faire*)



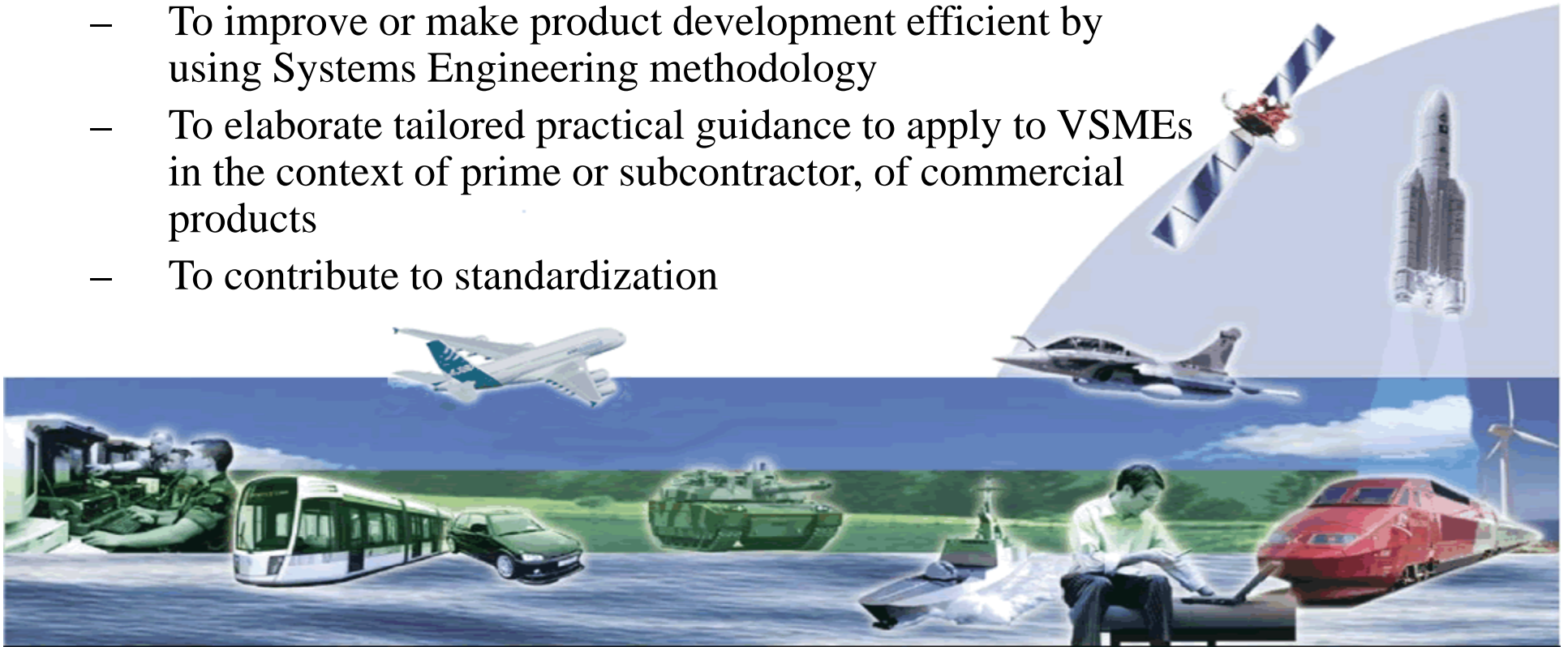
## Implementation of ISO/IEC 29110 in Thailand

«Thailand is now using the new software engineering standard ISO29110 in piloting software procurement related in Thai government agencies. There are around 200 government agencies interested in this direction. Within 3 years, Thailand hope to mandate ISO29110 as the minimum requirement for all Thai government related for software and system procurement.»

Dr. Anukul Tamprasirt, November 29th 2010

# Development of Profiles and DPs in Systems Engineering Similar to ISO/IEC 29110

- Project done under sponsorship of INCOSE/AFIS
  - International Council on Systems Engineering (INCOSE)
  - Association Française d'ingénierie système (AFIS)
- Goals
  - To improve or make product development efficient by using Systems Engineering methodology
  - To elaborate tailored practical guidance to apply to VSMEs in the context of prime or subcontractor, of commercial products
  - To contribute to standardization



# Systems Engineering for VSEs

- The initial strategy was to use the INCOSE Systems Engineering (SE) Handbook as the framework for a new ISO standard for VSEs involved in Systems Engineering (SE)
- It was proposed, in December 2010, to ‘switch’ from the INCOSE Handbook to the ISO/IEC 15288 standard and keep the Handbook for the development of the set of DPs.
- Accomplishments
  - A survey was performed
  - INCOSE Workshop (Phoenix, USA) in February 2011
    - ISO/IEC 29110 has been presented and discussed
    - Systems engineers reviewed Part 5-1-2 to propose SE Activities, tasks, documents, etc. to the Project Management Process and Implementation process
    - Draft document has been sent for reviews and updated
  - A proposal to develop a new Standard for VSE involved in SE has been tabled by Canada at the ISO SC7 Plenary meeting in Paris in May 2011
    - To develop a SE Basic profile (i.e. Part 4 and Part 5) to match the ISO 29110 Basic profile
- The proposal to develop a new SE standard has been approved

# Conclusion



- **Tools developed to help VSEs implement ISO/IEC 29110**
  - Network of International collaboration Centers to support VSEs
  - Deployment Packages and software tools (e.g. Plug-ins)
  - Public Web sites
  - Pilot Projects, Educational material
  - Articles, book chapter, textbooks
  - Wikipedia
- **Tools under development**
  - Development of a ‘light’ evaluation method
  - Development of formal certification method
  - Development of Deployment Packages (DP) in SharePoint
  - Development of ‘Expert Mode’ DP (2-3 pages)
  - Documentation of Pilot Projects and Case Studies
  - Evaluation of the benefits/impacts of ISO/IEC 29110
  - Development of self-learning/video modules

**The set of tools should help VSEs to be more competitive by implementing ISO/IEC 29110**



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- **Public site of WG 24**

- **Free access to Deployment Packages, presentation material and articles:**

- **<http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html>**



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**Abregado  
Merci  
Thank you**

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