

The Development of Systems Engineering International Standards and Support Tools for Very Small Entities

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July 12th 2012



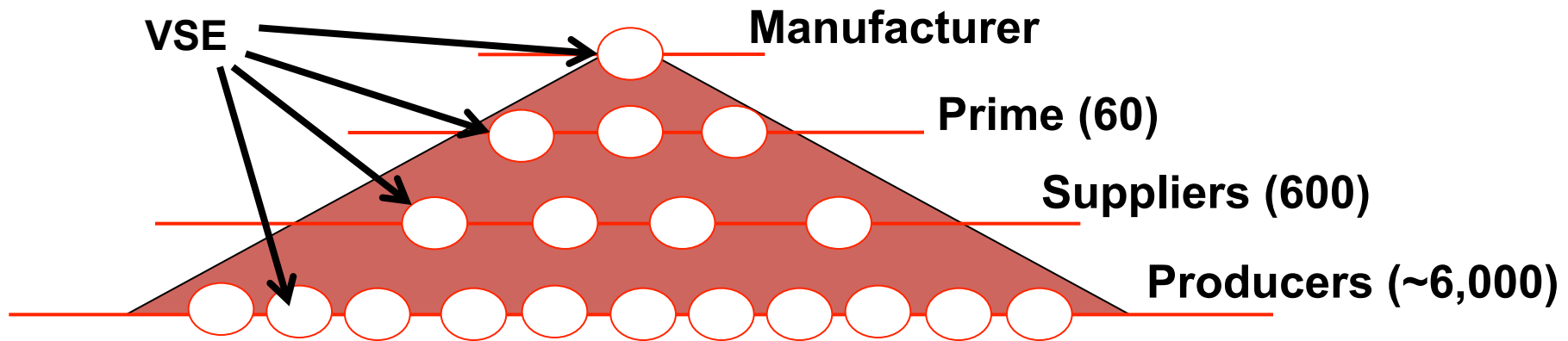
Content

- Introduction
- Importance of Very Small Entities (VSEs) - Context
- Development of International Standards for VSEs
- Basic Systems and Engineering profile : differences with software engineering
- Deployment packages
- ISO/JTC1/WG24 - standardization activities
- Conclusion: 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.

The Importance of VSEs



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, 2006)

Context

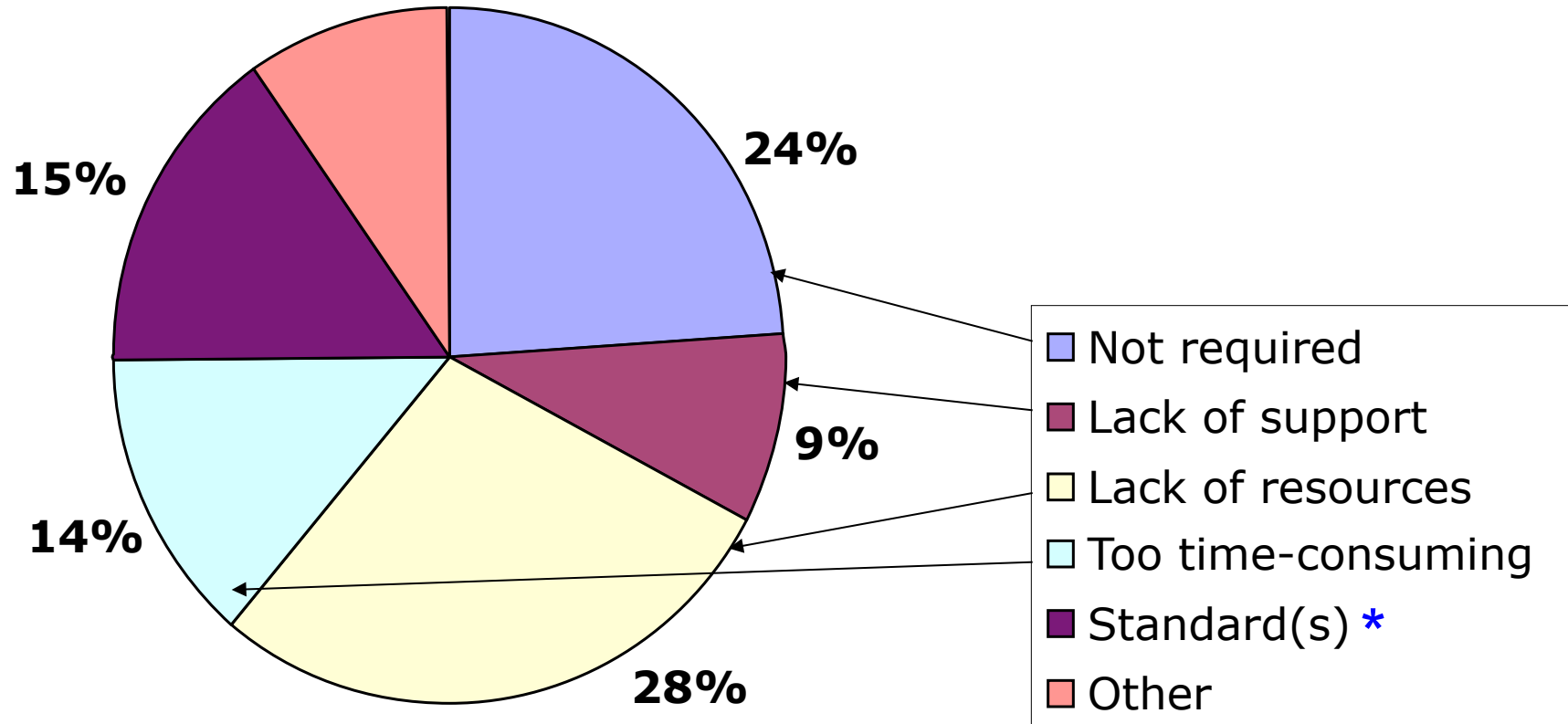
- Systems Engineering concepts have been adopted and adapted by most industries in various domains for development products and services.
- Most of VSEs cannot afford the resources, in terms of number of employees, cost and time, nor do they see a net benefit in establishing system life cycle processes
 - Difficulties to implement standards: no resources
 - Methodologies are not always written, shared.
 - Processes are often improvised.

Context

- VSEs are implied involved in schemes such as Extended Enterprise, Groups of Enterprises, Innovation Platforms
 - Integration into the Systems Engineering process customers sometimes with risks associated
 - Passage of a statute of supplier to systems engineering
 - New relationships with contractors and / or partners
- The consequence can be profound cultural changes
 - New methodologies
 - New tools or workshops
 - New risk-taking
 - New actors in a global context

Context

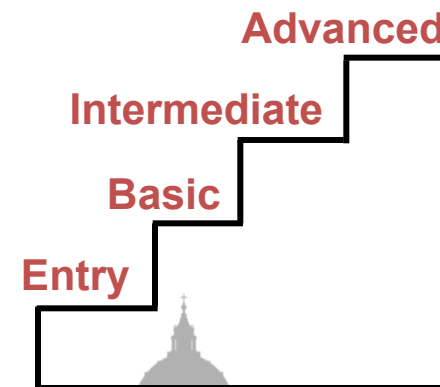
Why don't VSEs use Standards?



* Difficult, Bureaucratic, not enough guidance.

Development of International Standards for VSEs

- **Four Profiles within the Generic Profile Group**
 - **Entry** - Targets VSEs typically developing 6 person-month projects or start-ups;
 - **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.



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

Obtained approval from ISO to make TRs available at no cost

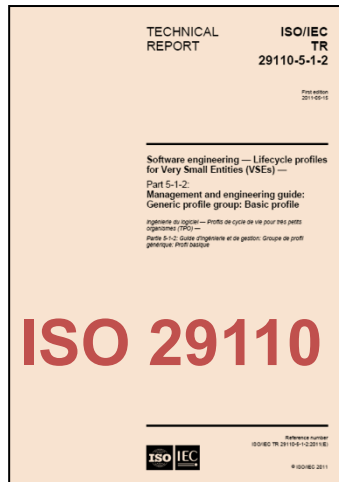
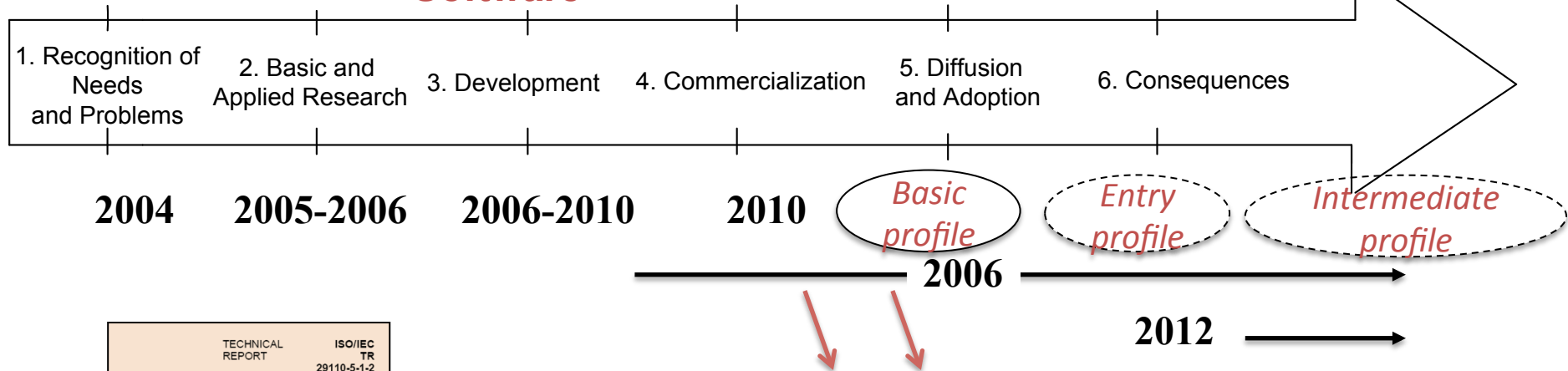


Development of International Standards for VSEs

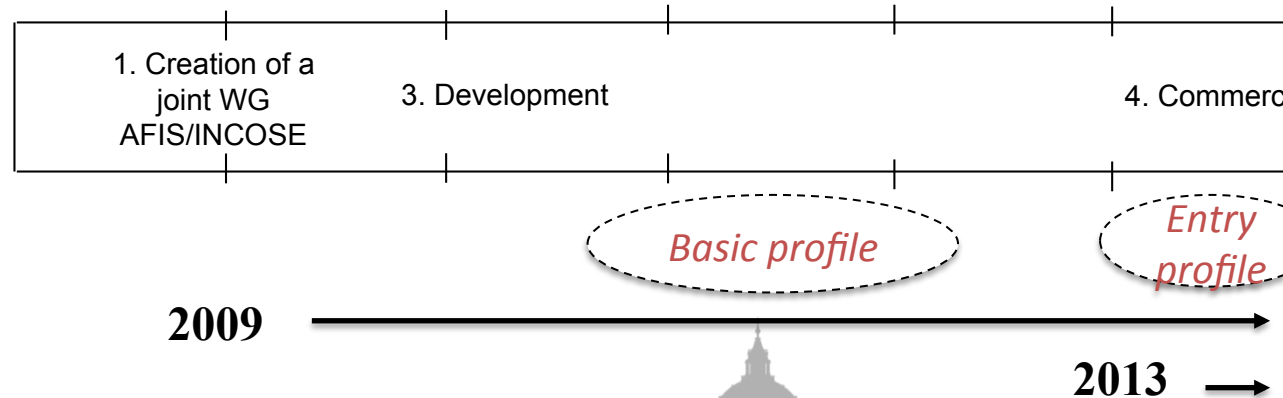


(adapted from Rogers, 2003)

Software

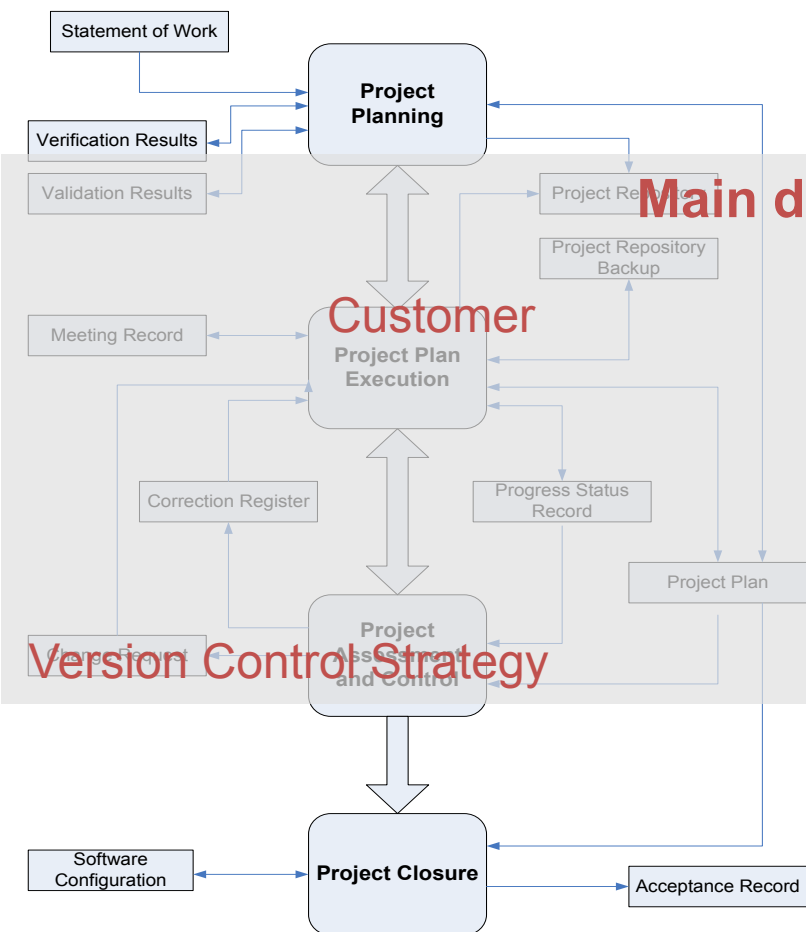


System

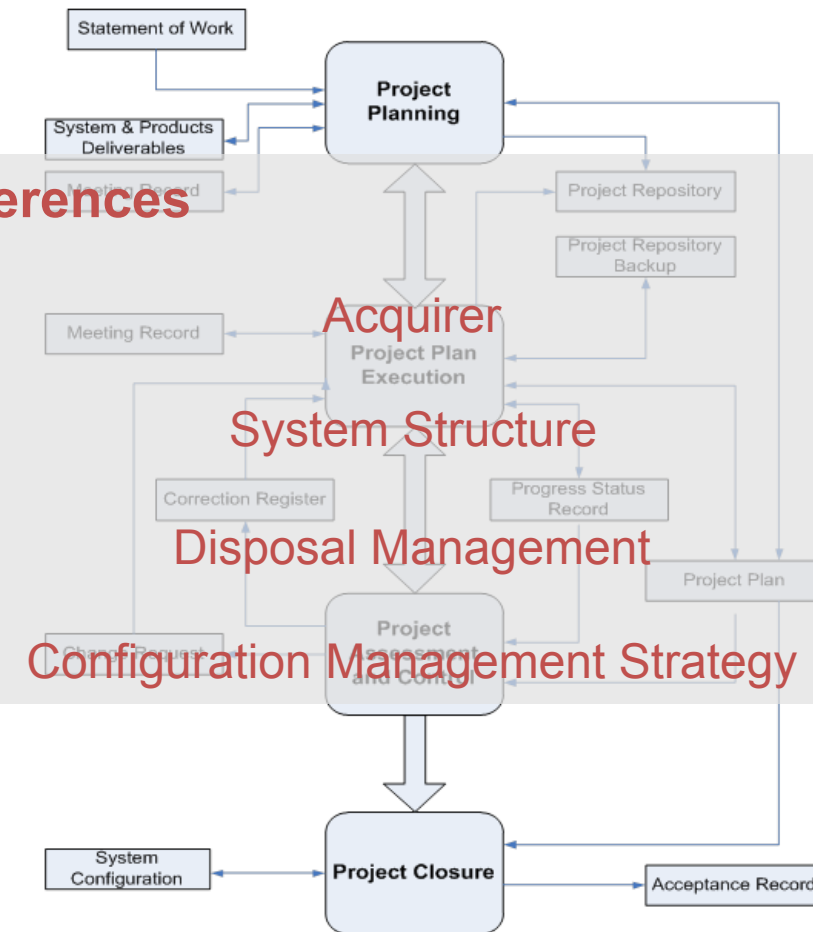


Project Management

Software Project Management Process

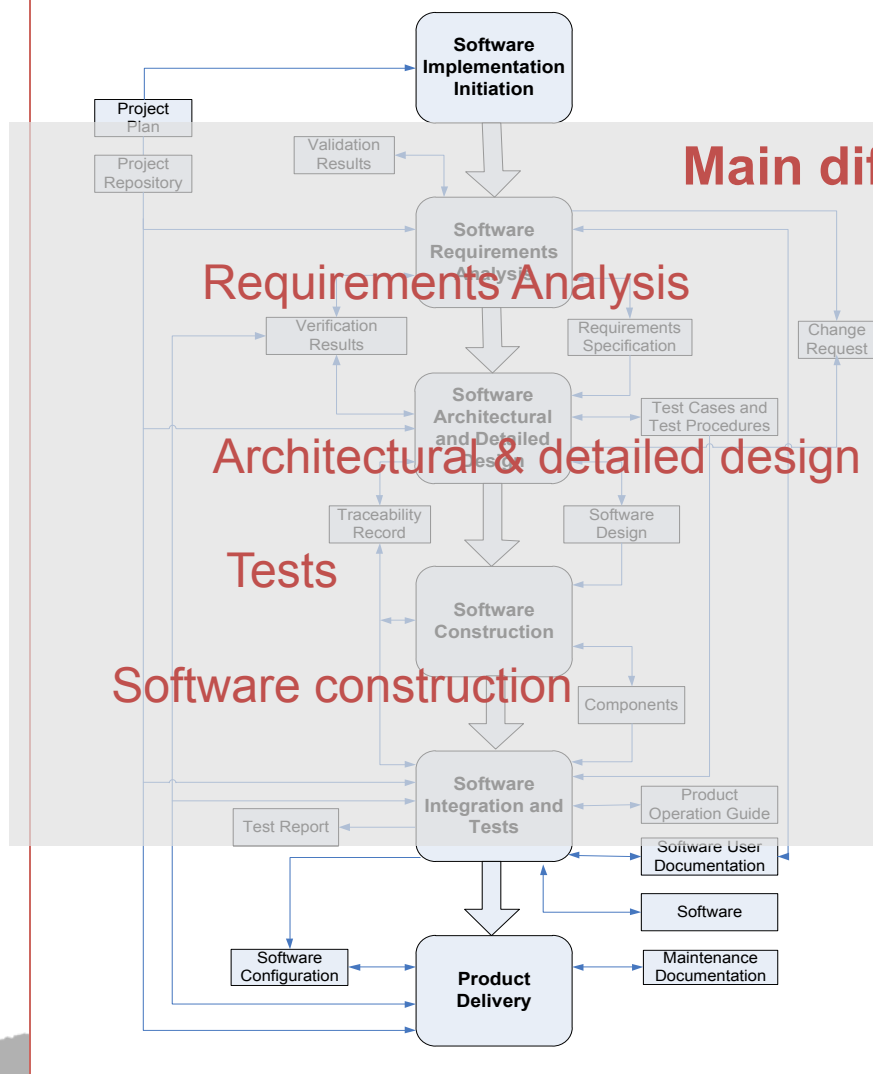


System Project Management Process

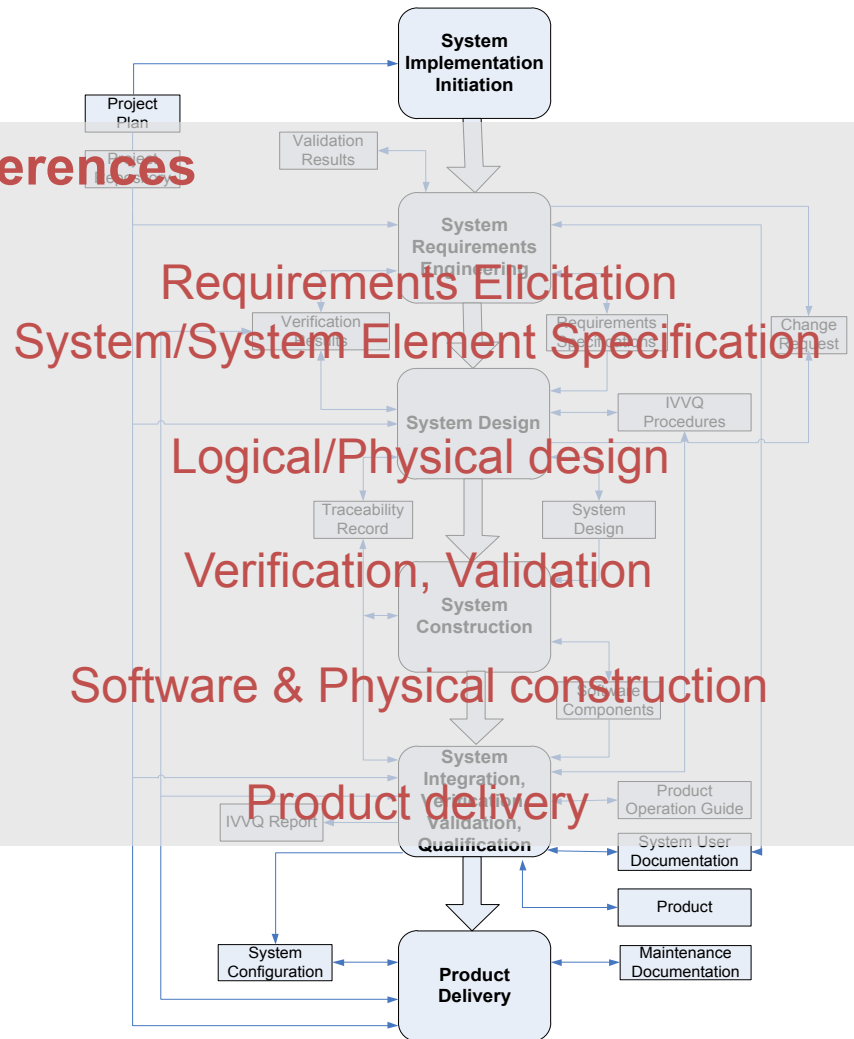


Implementation process

Software Implementation Process



System Implementation Process



Main differences

Requirements Analysis

Architectural & detailed design

Tests

Software construction

Requirements Elicitation

System/System Element Specification

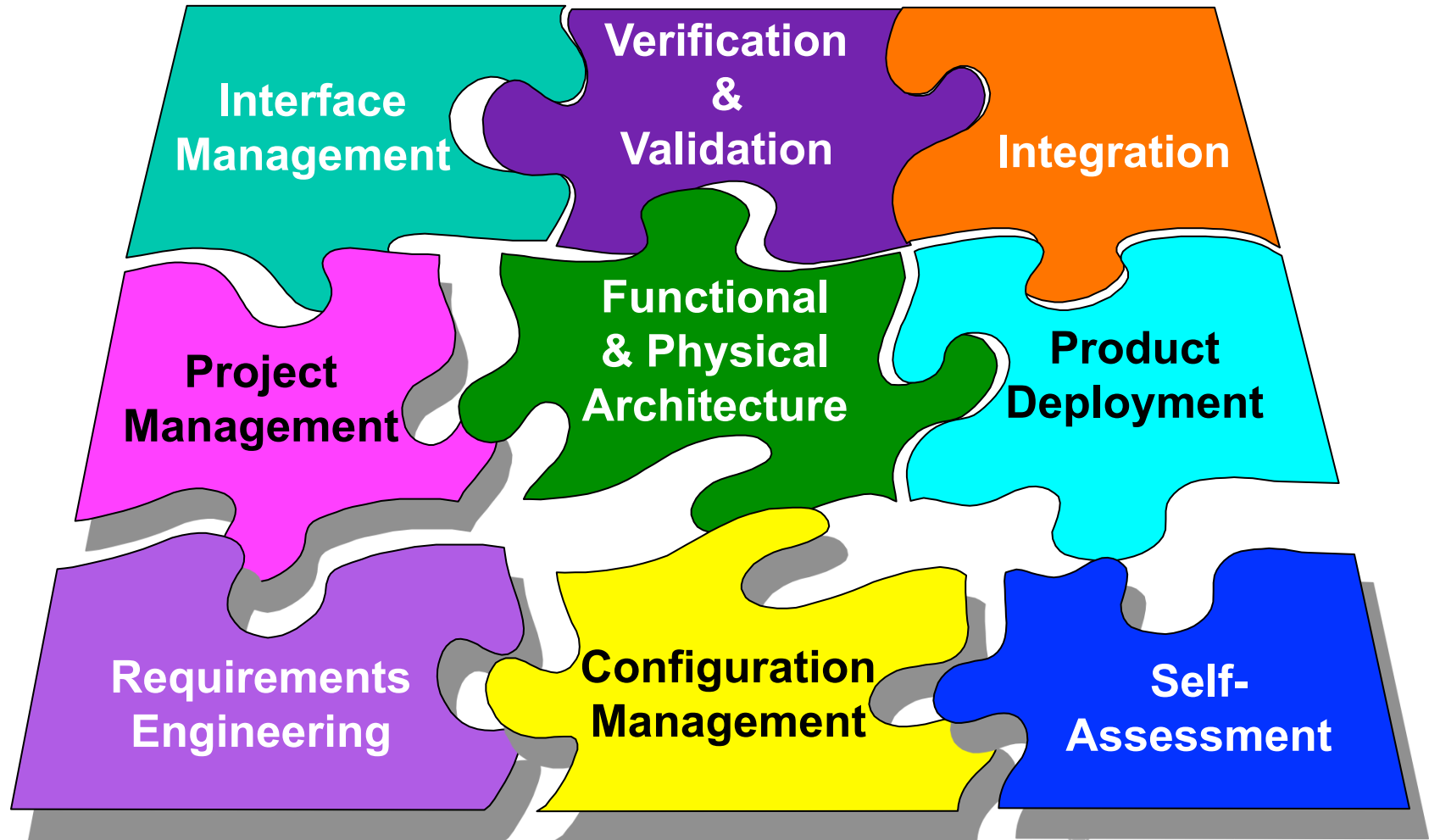
Logical/Physical design

Verification, Validation

Software & Physical construction

Product delivery

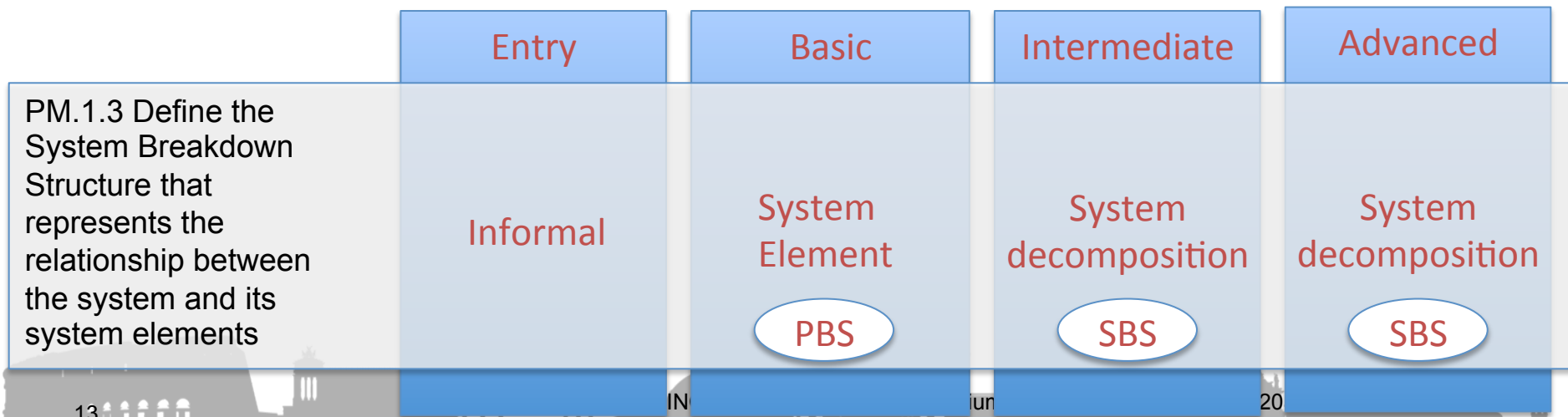
Deployment packages



ISO/JTC1/WG24 – Jeju Korea



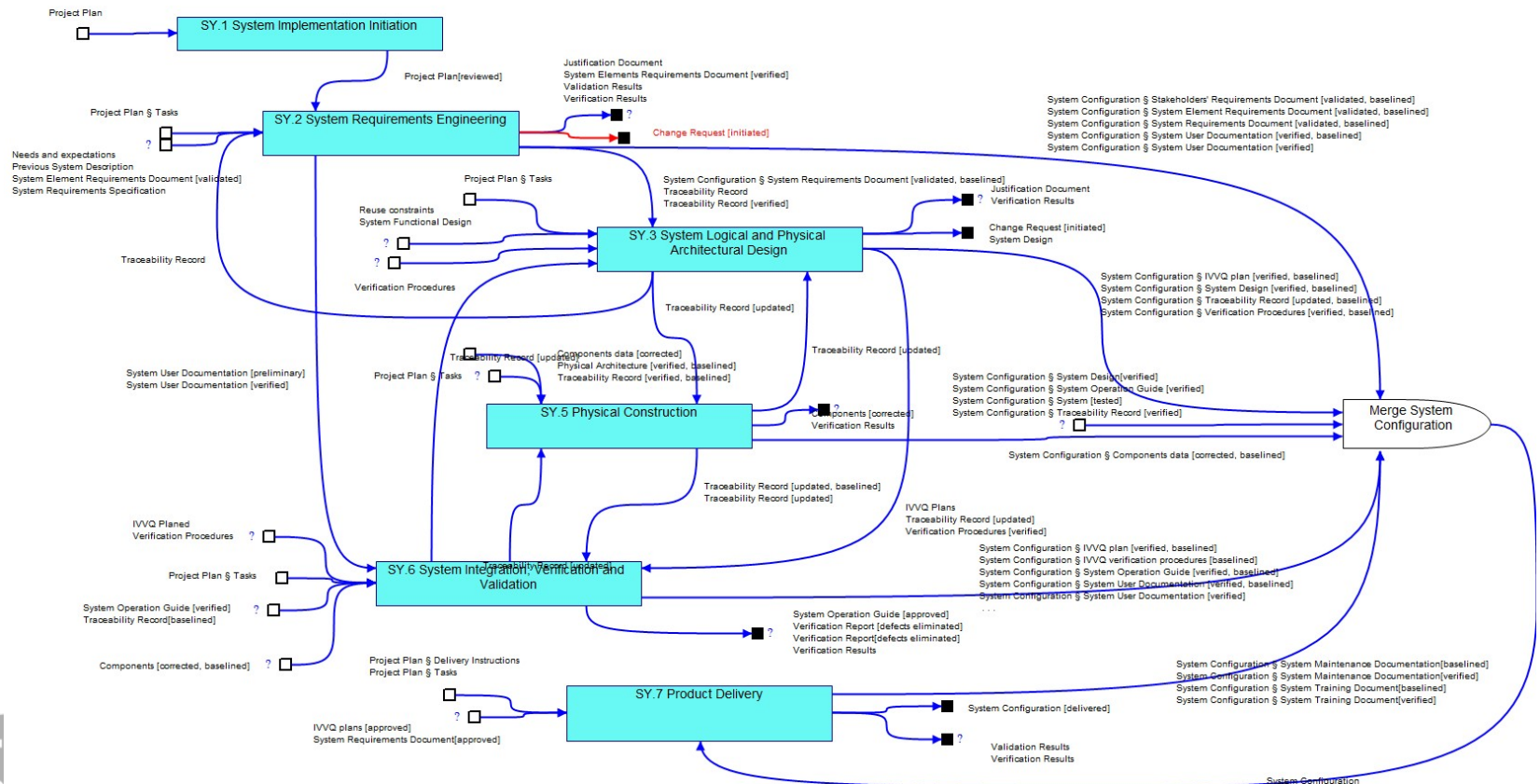
- SE basic profile
 - 336 comments : Japan, USA, France, Brazil, Canada, Australia, Germany
 - Next revision available mid-August for review
- In parallel establishment of a big picture in order to harmonize the SE profiles group



What is suitable for VSEs?

- Make it simple ! Use process modeling to focus on the target: VSEs

Process: System Implementation



Conclusion: next steps

- ISO/JTC1/WG24: update the part 5 of the “SE basic profile”

iterations



ISO Stage ID	Document Type	Exit (Ballot Completed) .60
10	NWI	Combined
20	WD	2011-11
30	PDTR	2012-05
40	DTR.1	2012-11
40	DTR.2	2013-05
60	TR	2013-09

- SE for VSMEs WG
 - Develop mapping between profiles, simplify processes if necessary (Oct 2012) for review at ISO WG24 meeting (12-16 Nov)
 - Develop deployment packages (End 2012)
 - Develop intermediate profile (2013-) in parallel with Software