ISO/IEC 29110
“Systems & Software Lifecycle Processes for Very Small Entities”

Welcome!
Agenda

• Introduction

• Systems & Software engineering standardization

• Problem statement

• VSE Solution: ISO29110

• Systems & Software engineering basic profile guides

• Conclusions

• Q&A
Introduction

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• (Safety) Systems & Software engineering consultant:
  • Systems engineer
  • Software Quality Assurance Manager
  • Process Manager
  • Safety Manager
  • RAMS engineer

• ISO JTC1 SC7 Belgium expert, ISO editor

• Certified ISO29110 Auditor
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Systems & Software engineering standardisation
ISO JTC1 SC7 Framework

Generic

ISO 15288:2015, System life cycle processes
ISO 12207:2015, Software life cycle processes
ISO 15289:2014, Content of life cycle Information Products
IEEE, Information Products Templates
ISO 15504: Process Assessment

ISO JTC1 SC7 Working Group (WG)

WG7: Life Cycle Management
WG2: Systems and Software Documentation
WG10: Process Assessment

Engineering Standards

Information Products (Documentation)

Process Assessment

Conformity Assessment
### ISO 15288:2015, System life cycle processes

#### Agreement Processes
- Acquisition Process (Clause 6.1.1)
- Supply Process (Clause 6.1.2)

#### Project Processes
- Project Planning Process (Clause 6.3.1)
- Project Assessment and Control Process (Clause 6.3.2)
- Decision Management Process (Clause 6.3.3)
- Risk Management Process (Clause 6.3.4)
- Configuration Management Process (Clause 6.3.5)
- Information Management Process (Clause 6.3.6)
- Measurement Process (Clause 6.3.7)
- Quality Assurance Process (Clause 6.3.8)
- Business or Mission Analysis Process (Clause 6.4.1)
- Stakeholder Needs & Requirements Definitions Process (Clause 6.4.2)

#### Technical Processes
- System Requirements Definition Process (Clause 6.4.3)
- Architecture Definition Process (Clause 6.4.4)
- Design Definition Process (Clause 6.4.5)
- System Analysis Process (Clause 6.4.6)
- Implementation Process (Clause 6.4.7)
- Integration Process (Clause 6.4.8)
- Verification Process (Clause 6.4.9)
- Transition Process (Clause 6.4.10)
- Validation Process (Clause 6.4.11)
- Operation Process (Clause 6.4.12)
- Maintenance Process (Clause 6.4.13)
- Disposal Process (Clause 6.4.14)

#### Organizational Project-enabling Processes
- Life Cycle Model Management Process (Clause 6.2.1)
- Infrastructure Management Process (Clause 6.2.2)
- Project Portfolio Management (Clause 6.2.3)
- Human Resource Management Process (Clause 6.2.4)
- Quality Management Process (Clause 6.2.5)
- Knowledge Management Process (Clause 6.2.6)

#### Decision Management Process
- Organizational Project-enabling Processes
- Technical Processes
- Project Processes
- Agreement Processes
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Problem statement

• VSEs are enterprises, organizations, departments or projects of up to 25 people.

• SMEs constitute the dominant form of business organisation in all countries world-wide, accounting for over 95% and up to 99% of the business population depending on country.

• From studies and surveys conducted, it is clear that the majority of International Standards do not address the need of VSEs.

• Conformance with these standards is difficult, if not impossible, giving VSEs no way, or very limited ways, to be recognized as entities that produce quality software in their domain.
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## ISO/IEC 29110 overview

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ISO 29110-5-6-2: Management and engineering guide: Generic profile group: Basic profile

The guide provides Project Management and System Realization processes which integrate practices based on the selection of:

- ISO/IEC 15288:2015, systems and software engineering - system life cycle processes
- ISO/IEC 15289:2014, Systems and Software engineering – Content of systems and software lifecycle process information products standards elements
ISO 29110-5-1-2: Management and engineering guide: Generic profile group: Basic profile

The guide provides *Project Management* and *Software Implementation processes* which integrate practices based on the selection of:

Process layer: interaction

- Project Management
- System Realization
- Software Implementation
- Hardware Development
Process layer: activities

**Project Management: activities**

- Project Planning
- Project Plan Execution
- Project Assessment and Control
- Project Closure

**System Definition & Realization: activities**

- Stakeholder Requirements
- System Architectural Design
- System Integration
- System Operation
- System Requirements Analysis
- System Implementation
- System Validation
- System Maintenance

**Software Implementation: activities**

- Software Implementation Initiation
- Software Architectural and Detailed Design
- Software Integration and Tests
- Software Construction
- Product Delivery
Process layer: product items

**Project Management: product items**
- Project Plan
- Project Repository
- Meeting Record
- Project Repository Backup
- Progress Status Record
- Correction Register
- Verification Results
- Change Request
- Acceptance Record

**System Definition & Realization: product items**
- Stakeholders Requirements
- System Requirements
- System Design
- System Elements
- System
- Traceability Record
- Test Cases, Procedures & Report
- Verification Reports
- Validation Report
- System User Manual
- System Operation Guide
- System Maintenance

**Software Implementation: product items**
- Requirements Specification
- Software Design
- Software Components
- Software
- Traceability Record
- Test Cases, Procedures & Report
- Verification Reports
- Validation Report
- Product Operation Guide
- Maintenance Documentation
- Software User Documentation
- Software Configuration
Process layer: roles

Project Management: roles
- Project Manager (PM)

System Definition & Realization: roles
- Work Team
  - Systems Engineer (SYS)
  - Designer (DES)
  - Developer (DEV)
  - IVV

Software Implementation: roles
- Work Team
  - Technical Leader (TL)
  - Designer (DES)
  - Analyst (AN)
  - Programmer (PR)
Project Management Overview

Project Management Process

- Project Plan
- Progress Status Record
- Project Repository
- Meeting Record
- Correction Register
- Change Request
- Project Repository Backup
- Project Plan Execution
- Project Assessment and Control
- Project Closure
- Acceptance Record
- Product

- Statement of Work

- PM, TL & CUS
- PM, WT & CUS
- PM, TL

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System Definition & Realization Overview

Stakeholder Requirements
Stakeholders Requirements Specification

System Requirements Analysis
System Requirements Specification
System Test Plan
System Requirement- Test Traceability Matrix

Verification
System Requirements Verification Report
System Test Plan Verification Report

System Architectural Design
System Design Document
System Integration Test Plan
Allocation Matrix

Verification
System Architecture Design Verification Report

System Implementation
SW Implementation (ISO 29110)
HW Fabrication

System Integration
System Integration Test Report

Verification
System Integration Test Report Verification Report

System Validation
System Validation Report

Verification
System Operation Verification Report
System Maintenance Verification Report

Maintenance procedure Verification Report

Traceability

SYS
DES
IVV
SW-Team
HW-Team
SILLIBERTY
Allocations

RBS

TBS

FBS

Function allocation

SBS

Requirements allocation

Interfaces

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Software Implementation Overview

Software Implementation Initiation
Project Plan
Statement of Work

Software Requirements Analysis
Requirements Specification
Testing
Test Cases & Procedures
Verification & Validation
Verification Results
Validation Results
Configuration Management
Change Request
Software Configuration

Software Architectural and Detailed Design
Software Design
Testing
Test Cases & Procedures
Verification
Verification Results
Configuration Management
Change Request
Software Configuration

Software Construction
Software Components
Testing
Unit Tests
Configuration Management
Change Request
Software Configuration

Product Delivery
Maintenance Documentation
Software Configuration

Verification
Verification Results
Configuration Management
Change Request
Software Configuration

Traceability Record
PM
WT
AN
CUS
TL
DES, AN
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Conclusions

By deploying this solution, the VSE can obtain the following benefits:

• An agreed set of project requirements and expected products is delivered to the customer.

• Disciplined management process that provides project visibility and corrective actions of project problems and deviations is performed.

• Systematic software implementation process that satisfies customer needs and ensures quality products

By certification the VSE can be recognized as an entity that produce quality in their domain.
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Thank you for attention!

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