Systems and Software Engineering

**Generic Profile Group: Basic Profile Guide for Very Small Entities**

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# Introduction

Very Small Entities (VSEs) around the world are contributing to valuable products and services. For the purpose of ISO/IEC 29110, a Very Small Entity (VSE) is an enterprise, an organization, a department or a project having up to 25 people. Since many VSEs develop and/or maintain system elements and software components used in systems, or sold to be used by others, recognition of VSEs as suppliers of high quality products is required.

From studies and surveys conducted, it is clear that the majority of International Standards do not address the needs of VSEs. Implementation of and conformance with these standards is difficult, if not impossible. Subsequently VSEs have no, or very limited, ways to be recognized as entities that produce quality systems/system elements including software in their domain. Therefore, VSEs are often cut off from some economic activities.

It has been found that VSEs find it difficult to relate International Standards to their business needs and to justify the application of standards to their business practices. Most VSEs can neither afford the resources, in terms of number of employees, expertise, budget and time, nor do they see a net benefit in establishing systems or software lifecycle processes. To rectify some of these difficulties, a set of guides has been developed according to a set of VSE characteristics. The guides are based on subsets of appropriate standards processes, activities, tasks, and outcomes, referred to as Profiles. The purpose of a profile is to define a subset of International Standards relevant to the VSEs’ context; for example, processes, activities, tasks, and outcomes of ISO/IEC 12207[2] for software; and processes, activities, tasks, and outcomes of ISO/IEC 15288[3] for systems; and information products (documentation) of ISO/IEC/IEEE 15289[4] for software and systems.

ISO/IEC 29110 is intended to be used with any lifecycles such as: waterfall, iterative, incremental, evolutionary or agile. The ISO/IEC 29110 series, targeted by audience, has been developed to improve system or software and/or service quality, and process performance.

## Systems Engineering Deployment Packages

In order to facilitate the implementation, by VSEs, of a Profile, a set of Deployment Packages are available.

A deployment package is a set of artefacts developed to facilitate the implementation of a set of practices, of the selected framework, in a VSE. But, a deployment package is not a complete process reference model. Deployment packages are not intended to preclude or discourage the use of additional guidelines that VSEs find useful.

The elements of a typical deployment package are: technical description, relationships with ISO/IEC 29110, key definitions, detailed description of processes, activities, tasks, steps, roles, products, template, checklist, example, references and mapping to standards and models, and a list of tools.

Hence by deploying and implementing a package, a VSE can see its concrete step to achieve or demonstrate coverage to Part 5. Deployment Packages are designed such that a VSE can implement its content, without having to implement the complete framework at the same time.



**The Nine (9) Deployment Packages**

1. System Requirements Engineering
2. System Architecture
3. Interface Management
4. System Integration
5. Verification and Validation
6. Configuration Management
7. Project Management
8. System Deployment
9. Self-Assessment

**Table of Content of a System Engineering Deployment Package:**

**1. Technical Description**

* Purpose of this document
* Why this Topic is important?

**2. Definitions**

**3. Relationships with ISO/IEC 29110**

**4. Overview of Processes, Activities, Tasks, Roles and Products**

**5. Description of Processes, Activities, Tasks, Steps, Roles and Products**

* Role Description
* System Description
* Artefact Description

6. **Template(s)**

**7. Example(s)**

**8. Checklist(s)**

**9. Tool(s)**

**10. References to other Standards and Models (e.g. ISO 9001, ISO/IEC 15288, CMMI-DEV®)**

**11. References**

**12. Evaluation form**

**﻿**

For the Basic Profile, a set of Systems Engineering Deployment Packages are available, at no cost, on the

Internet:

1. System Requirements Engineering
2. System Architecture
3. Interface Management
4. System Integration
5. Verification and Validation
6. Configuration Management
7. Project Management
8. System Deployment
9. Self-Assessment

# Scope

1.

## Fields of application

This guide is applicable to Very Small Entities (VSEs). VSEs are enterprises, organizations, departments or projects having up to 25 people. The lifecycle processes described in the set of International Standards (IS) and Technical Reports (TR) are not intended to preclude or discourage their use by organizations bigger than VSEs.

This guide provides the management and engineering guide to the Basic Profile described in ISO/IEC 29110-4-6 through Project Management and System Definition and realization processes. This guide should be used in conjunction with ISO/IEC 29110.

This guide is for non-critical systems development projects. The system development should fulfil the project requirements and the system description.

Using the guide, a VSE can obtain benefits in the following aspects:

* An agreed set of project requirements (technical part of contract) and expected products are agreed by the Acquirer.
* A disciplined management process, that provides project visibility and corrective actions of project problems and deviations, is performed.
* A systematic System Definition and Realization process, that satisfies Acquirer needs and ensures quality products, is followed.
* VSEs developing software that is part of a larger system, and for stand-alone software products and services, are encouraged to use the management and engineering guide of the Basic Profile

## Target Audience

This guide is targeted at VSEs who do not develop critical systems and do not have experience with SE process planning and implementation using ISO/IEC 15288.

It is intended to be used with any processes, techniques and methods that enhance the VSE’s Stakeholder satisfaction and productivity.

## Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC TR 29110-1, Software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 1: Overview

**Terms and definitions**

| **Term** | **Definition** |
| --- | --- |
| **acquirer** | stakeholder that acquires or procures a product or service from a supplier |
| **critical system** | those items (e.g. functions, parts, software, characteristics, processes) having significant effect on the product realization and use of the product – including safety, performance, form, fit, function, producibility, service life, etc. – that require specific actions to ensure they are adequately managed |
| **disposed system** | system that has been transformed (i.e. state change) by applying the disposal process |
| **operator** | entity that performs the operations of a system |
| **Systems Engineering Plan (SEP)** | top‐level plan for managing the SE effort which, as such, defines how the project will be organized,structured, and conducted and how the total engineering process will be controlled to provide a productthat satisfies stakeholder requirements |
| **Small and Medium Enterprise** | enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding50 million euro, and/or an annual balance sheet total not exceeding 43 million euro) |
| **system** | combination of interacting elements organized to achieve one or more stated purposes |
| **trade-off** | decision-making actions that select from various requirements and alternative solutions on the basis ofnet benefit to the stakeholders |
| **user** | individual or group that benefits from a system during its utilization |
| **system structure** | decomposition of a system of interest into a set of interacting systems and system elements |
| **statement of work**  | document used by the acquirer that includes the needs and expectations, the scope, objectives anddeliverables |
| **work breakdown structure**  | [Output/Input] deliverable-oriented hierarchical decomposition of the work to be executed by theproject team to accomplish the project objectives and create the required deliverables |

# Symbols and abbreviated terms

## Naming, diagramming and definition conventions

| **Term** | **Description** |
| --- | --- |
| **Name**  | Process identifier followed by its abbreviation in brackets “( )”. |
| **Purpose**  | General goals and results expected of the effective implementation of the process. The implementation of the process should provide tangible benefits to the stakeholders. The purpose is identified by the abbreviation of the process name. |
| **Objectives** | Specific goals to ensure the accomplishment of the process purpose. The objectives are identified by the abbreviation of the process name, followed by the letter “O” and a consecutive number, for example PM.O1, SR.O2, etc. |
| **Input Products** | Products required to perform the process and its corresponding source, which can be another process or an external entity to the project, such as the Acquirer. Identified by the abbreviation of the process name and showed as two column table of product names and sources. |
| **Output Products** | Products generated by the process and its corresponding destination, which can be another process or an external entity to the project, such as Acquirer or Organizational Management. Identified by the abbreviation of the process name and showed as two column table of product names and destinations. |
| **Internal Products**  | Products generated and consumed by the process. Identified by the abbreviation of the process name and showed as one column table of the product names. All products’ names are printed in cursive and initiate with capital letters. Some products have one or more statuses attached to the product name surrounded by square brackets “[ ]”and separated by ”,”. The product status may change during the process execution. See **Product Descriptions** table in **ISO/IEC TR 29110-5-6-2** for the alphabetical list of the products, its descriptions, possible statuses and the source of the product. The source can be another process or an external entity to the project, such as the Acquirer. |
| **Rectangle boxes** | The rectangle boxes following the description of processes objectives make the correspondence with ISO/IEC 15288:2008 standard. |
| **Roles involved** | Names and abbreviation of the functions to be performed by project team members.Several roles may be played by a single person and one role may be assumed by several persons. Roles are assigned to project participants based on the characteristics of the project. The role list is identified by the abbreviation of the process name and showed as two-column table. See the Roles section in this documentfor the alphabetical list of the roles, its abbreviations and required competencies description. |
| **Diagram** | Graphical representation of the processes. The large round-edged rectangles indicate process or activities and the smaller square-edged rectangles indicate the products. The directional or bidirectional thick arrows indicate the major flow of information between processes or activities. The thin directional or bidirectional arrows indicate the input or output products. The notation used in the diagrams does not imply the use of any specific process lifecycle. |
| **Activity** | A set of cohesive tasks. Task is a requirement, recommendation, or permissible action, intended to contribute to the achievement of one or more objectives of a process. A process activity is the first level of process workflow decomposition and the second one is a task. Activities are identified by process name abbreviation followed by consecutive number and the activity name. |
| **Activity Description** | Each activity description is identified by the activity name and the list of related objectives surrounded by brackets “( )”. For example PM.1 Project Planning (PM.O1, PM.O5, PM.O6,PM.O7) means that the activity PM.1 Project Planning contributes to the achievement of the listed objectives: PM.O1, PM.O5, PM.O6 and PM.O7. The activity description begins with the task summary and is followed by the task descriptions table. The task description doesn’t impose any technique or method to perform it. The selection of the techniques or methods is left to the VSE or project team. |
| **Incorporation to *Project Repository*** | List of products to be saved in *Project Repository*; the *Configuration Management Strategy* has to be applied to some of them See Section **7.7.2** **PM incorporation to Project Repository** and **8.7.2 SR incorporation to the Project Repository** in **ISO/IEC TR 29110-5-6-2**. It is useful as a checklist for project manager and technical leader. |

## Abbreviated Terms

| **Acronym** | **Term** |
| --- | --- |
| ACQ | Acquirer |
| HW | Hardware |
| IVV | Integration, Verification, Validation |
| PO | Purchase Order |
| PM | Project Management |
| PJM | Project Manager |
| SBS | System Breakdown Structure |
| SDD | System Design Document |
| SEMP | System Engineering Management Plan |
| SEP | Systems Engineering Plan |
| SMART | Specific, Measurable, Achievable, Relevant and Traceable |
| SME | Small and Medium Enterprise |
| SBS | System Breakdown Structure |
| SOW | Statement of Work |
| SR | System Definition and Realization |
| STK | Stakeholder |
| SW | Software |
| TPM | Technical Performance Management |
| VSE | Very Small Entity |
| WBS | Work Breakdown Structure |

# Overview

The Basic Profile Management and Engineering Guide applies to a Very Small Entity (VSE), i.e. enterprise, organization, department or project having up to 25 people, dedicated to system development of noncritical systems. The project may fulfil an external or internal contract. The internal contract between the project team and its Acquirer need not be explicit.

The Guide provides Project Management (PM) and System Definition and Realization (SR) processes which integrate practices based on the selection of ISO/IEC 15288, *Systems and software engineering*

*—System life cycle processes* and ISO/IEC/IEEE 15289, *Systems and software engineering – Content of lifecycle information products (documentation)* standards elements. Annex A provides information about

This part of ISO/IEC 29110 is intended to be used by the VSE to establish processes to implement any development approach or methodology including, e.g. agile, evolutionary, incremental, test driven development, etc. based on the VSE organization or project needs.

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

* A set of project requirements (technical part of the contract) and expected products are agreed with the Acquirer.
* A disciplined management process, that provides project visibility and corrective actions of project problems and deviations, is performed;
* A systematic System Definition and Realization process, that satisfies Acquirer needs and ensures quality products, is followed.

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

* Project *Needs and Expectations* are documented;
* Feasibility of the project was performed before its start;
* Project team, including project manager and system engineer, is assigned and trained; and
* Goods, services and infrastructure to start the project are available.

**Tasks Description Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Task** | **Input Products** |  **Output Products** |
| The abbreviation of roles involved in the task execution. | Description of the task to be performed. Each task is identified by activity ID and consecutive number, for example PM1.1, PM1.2, and so on. | Products needed to execute the task. | Products created or modified by the execution of the task. |

# Project Management (PM) Process

## PM Purpose

The purpose of the Project Management process is to establish and carry out in a systematic way the *Tasks* of the system development project, which allows complying with the project’s *Objectives* in the expected quality, time and costs.

This guide is intended to be used by the VSE to establish processes to implement any development approach or methodology including, e.g. agile, evolutionary, incremental, test driven development, etc. based on the VSE organization or project needs.

## PM Objectives

**PM.O1.** The *Project Plan*, the *Statement of Work* (SOW) and commitments are reviewed and accepted by both the Acquirer and the Project Manager. The *Tasks* and *Resources* necessary to complete the work are sized and estimated.

**PM.O2.** Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status*

*Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Acquirer acceptance documented in the *Product Acceptance Record*.

**PM.O3.** *Change Requests* are addressed through their reception and analysis. Changes to system requirements are evaluated by the project team for cost, schedule, risks and technical impact.

**PM.O4.** Review meetings with the Work Team and the Acquirer, suppliers are held. Agreements are registered and tracked.

**PM.O5.** A *Risk Management Approach* is developed. Risks are identified, analyzed, prioritized, and monitored as they develop and during the conduct of the project. Resources to manage the risks are determined.

**PM.O6.** A *Product Management Strategy* is developed. Items of *Product* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Acquirer and

Work Team. The storage, handling and delivery of the items are controlled.

**PM.O7.** Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *System Requirements Specifications*. NOTE The implementation of the Quality Assurance is through the performance of the verifications, validations and review *Tasks* performed in Project Management and System Definition and Realization processes.

**PM.O8.** A *Disposal Management Approach* is developed to end the existence of a system entity.

## Table 1 — PM Input Products

|  |  |
| --- | --- |
| **Name** | **Source** |
| Statement of Work | Acquirer |
| All deliverables from SR | Work Team |
| Change Request | Acquirer, StakeholdersWork TeamSuppliers |

## Table 2 — PM Output Products

|  |  |
| --- | --- |
| **Name** | **Source** |
| Project Plan  | System Definition and Realization |
| Product Acceptance Record  | Organizational Management |
| Project Repository  | System Definition and Realization |
| Meeting Record | Acquirer, Stakeholders |
| Product | Acquirer, StakeholdersSystem Definition and RealizationSuppliers |
| Purchase order | Suppliers |

## Table 3 — PM Internal Products

|  |
| --- |
| **Name** |
| Change Request |
| Correction Register |
| Justification Document |
| Meeting Record |
| Progress Status Record |
| Project Repository |
| Product Acceptance Record |
| Verification Report |

## Table 4 — PM roles involved

|  |  |
| --- | --- |
| **Role** | **Abbreviation** |
| Acquirer | ACQ |
| Stakeholders | STK |
| Project Manager | PJM |
| Work Team | WT |
| Designer | DES |
| Systems Engineer | SYS |

## PM diagram

The following diagram shows the flow of information between the Project Management Process activities



**Figure 3 — Project Management process diagram**

## Table 5 — Project Management Tools

|  |  |
| --- | --- |
| **Activity** | **Resource Documents** |
| Project PlanningProject Plan ExecutionProject Assessment and ControlProject Closure | Tool allowing document, manage and control the *Project**Plan.*Tool allowing Project scheduling, tasks definition,resources and cost management.Tool allowing the measurement of the project executionTool to manage project configuration and changes. |

# System Definition and Realization (SR) process

## SR Purpose

The purpose of the System Definition and Realization process is the systematic performance

of the specification of system/system element, analysis, design, construction, integration and verification/validation activities for new or modified system according to the specified requirements.

This guide is intended to be used by the VSE to establish processes to implement any development approach or methodology including, e.g. agile, evolutionary, incremental, test driven development, etc. based on the VSE organization or project needs.

**SR.O1 Example** refers to the **Mapping between the objectives of ISO/IEC TR 29110-5-6-2 and ISO/IEC 15288:2008** found in **Annex B (informative)** in the **ISO/IEC TR 29110-5-6-2** document**.** These tables can be used to develop your basic deployment packages. Example deployment packages are made available through the <http://profs.etsmtl.ca/claporte/english/VSE/> provided by Claude Y. Laporte, Ph.D., Engineering.

**SR.O1 Example**

|  |
| --- |
| *6.3.1 Project planning process**d) Plans for the execution of the project are activated and maintained.**[ISO/IEC 15288:2008, 6.3.1]* |

## SR Objectives

**SR.O1.** *Tasks* of the activities are performed through the accomplishment of the current *Project Plan*.

**SR.O2**. System requirements are defined, analyzed for correctness and testability, approved by the Acquirer, baselined and communicated.

**SR.O3.** The System architectural design is developed and baselined. It describes the *System elements* and internal and external interfaces of them. Consistency and traceability to system requirements are established.

NOTE: System architecture and detailed design can be performed separately according to the project schedule.

**SR.O4.** System elements defined by the design are produced or acquired. Acceptance tests are defined and performed to verify the consistency with requirements and the design. Traceability to the requirements and design are established.

**SR.O5.** System elements are integrated. Defects encountered during integration are corrected and consistency and traceability to *System Architecture* are established.

**SR.O6.** A *System Configuration*, as agreed in the Project Plan, and that includes the engineering artefacts is integrated, baselined and stored at the *Project Repository*. Needs for changes to the *Product* are detected and related change requests are initiated.

**SR.O7.** Verification and Validation *Tasks* of all required work products are performed using a defined criteria to achieve consistency among output and input products in each activity. Defects are identified, and corrected; records are stored in the *Verification/Validation Reports*.

NOTE: It’s not the intention that all verification activities and work products are made available to the acquirer and other stakeholders. Verifications should be performed by individuals that have organizational freedom, authority, to permit objective evaluation, and to initiate, effect, resolve and verify problem resolution.

## Table 6 — SR Input Products

|  |  |
| --- | --- |
| **Name** | **Source** |
| *Project Plan* | Project Management |
| *Project Repository* | Project Management |

## Table 7 — SR Output Products

|  |  |
| --- | --- |
| **Name** | **Destination** |
| *All deliverables from SR* | Project Management |

## Table 8 — SR Internal Products

|  |
| --- |
| **Name** |
| *Validation Report* |
| *Verification Report* |

## Table 9 — SR roles involved

|  |  |
| --- | --- |
| **Role** | **Abbreviation** |
| Acquirer | ACQ |
| Systems Engineer | SYS |
| Designer | DES |
| Developer | DEV |
| IVV Engineer | IVV |
| Project Manager | PJM |
| Stakeholder | STK |
| Supplier | SUP |
| Work Team | WT |

## SR diagram

Overview SR diagram

The following diagram shows the flow of information between the System Definition and Realization Process activities including the most relevant work products and their relationship.



**Figure 4 — System Definition and Realization process diagram**

## SR Activities

These activities are instrumental in the development of the deployment package content.

### 6.4.1 SR.1 System Definition and Realization Initiation (SR.O1)

The System Definition and Realization Initiation activity ensures that the *Project Plan* established in

Project Planning activity is committed to by the Work Team. The activity provides:

* Review of the *Project Plan* by the Work Team to determine task assignment.
* Commitment to *Project Plan* by the Work Team and Project Manager.
* An established implementation environment.

### 6.4.2 SR.2 System Requirements Engineering (SR.O2, SR.O6, SR.O7)

The System Requirements Engineering activity elicits and analyses the Acquirer and other Stakeholders’ requirements, including legal and/or regulatory requirements. It establishes the agreed system requirements. In parallel of the architectural design activities, it establishes System Element requirements. The activity provides:

* Work Team review of the *Project Plan* to determine task assignment.
* Elicitation, analysis and specification of Acquirer and other stakeholders’ requirements.
* Specification and agreement on the System requirements.
* Specification of system elements’ requirements
* Verification of implemented system against System and System elements requirements
* Validation of Stakeholder, System and System Elements requirements
* Validation of implemented system against Stakeholder requirements
* Establish and update the traceability between Stakeholders, System, System Elements requirements
* Establish and update the coverage of Requirements by IVV artefacts
* Configuration management of System Requirements Engineering products as agreed in the Configuration Management Plan

### 6.4.3 SR.3 System Architectural Design (SR.O3, SR.O6, SR.O7)

The System Architectural activity transforms the system requirements to the system functional and physical architecture. The activity provides:

* Work Team review of the *Project Plan* to determine task assignment.
* Design the system functional architecture and associated interfaces.
* Design the system physical architecture and associated interfaces, allocation of the functional to the physical architecture.
* Work Team review of the System *Requirements Specifications.*
* *Functional and physical Design* verified and defects corrected.
* Verified *IVV Plan (Integration, Verification, validation, Qualification) and Verification Procedures*.
* **﻿**Traceability between the functional architecture definition and the System Requirements and between the physical architecture definition, the System Elements and the functional architecture definition.
* Design products placed under configuration management.

### 6.4.4 SR.4 System Construction (SR.O4, SR.O6, SR.O7)

The System Construction involves Physical Construction and/or Software Construction. The Software Construction develops the software elements of the system from the *System Design.* The Hardware Construction develops the Hardware system elements from the *System Design*, that include (or not) software elements. The activity provides:

* Work Team review of the *Project Plan* to determine task assignment.
* Work Team review of the Physical *Design*.
* *Hardware System Elements* to be developed and tested.
* *Software System Elements* to be developed and tested.
* Traceability between Hardware *Construction, Software Construction* and *Physical Architecture,*

### 6.4.5 SR.5 System Integration, Verification and Validation (SR.O5, SR.O6, SR.O7)

The System Integration and verification, validation activity ensures that the integrated System Elements (e.g. Hardware, Hardware + Software) satisfy the system requirements. The activity provides:

* Work Team review of the *Project Plan* to determine task assignment.
* Understanding of *IVV plan and Procedures* and the integration environment.
* Integrated *System Elements*, corrected defects and documented results.
* Documented and verified operational and system user documentations.
* Verified System baseline.

### 6.4.6 SR.6 Product Delivery (SR.O6, SR.O7)

The Product Delivery activity provides the integrated System (i.e. Product) to the Acquirer and other stakeholders. The activity provides:

* Work Team review of the *Project Plan* to determine task assignment.
* Verified System *Maintenance Document*.
* Delivery of the *Product* and applicable system documentation in accordance with the *Delivery Instructions*.

**SR incorporation to the Project Repository**

The list of products to be saved in the *Project Repository are found in* ***ISO/IEC TR 29110-5-6-2:2014(E) in the project repository section.***After the incorporation, the *Configuration Management* has to be applied to: System *Requirements Specifications, System Design, Traceability Matrix, IVV Plan and IVV Procedure, System Elements (Hardware, Hardware + Software, Software), System, System Operation Guide, System User Documentation, Maintenance and Training Documentation*.

## Table 10 — System Definition and Realization Tools

|  |  |
| --- | --- |
| **Activity** | **Resource Documents** |
| System Definition and Realization InitiationSystem Requirements EngineeringSystem DesignSystem IntegrationSystem VerificationProduct Delivery | * Requirements Engineering tool allowing elicitation, definition, management and traceability of requirements through the system life cycle (including exchanges with suppliers).
* Design tool allowing definition of the functional and physical architecture, definition of interfaces and traceability to the Requirements (including modelling tools).
* Tools allowing integration, verification, validation, qualification of the system.
* Tool to manage defects within a configuration management process
* Tools allowing training the stakeholders in the delivery phase to the use and maintenance of the system.

Tools for documentation management. |
| System Construction | Construction Tools allowing developing the products of the system (hardware, software). |

# Roles

There are extensive and detailed descriptions of the roles found in ISO/IEC TR 29110-5-6-2:2014(E). This information should be used in conjunction with the 9 deployment packages.

This is an alphabetical list of the roles, their abbreviations and suggested competencies description.

## Table 10 — Roles

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Role** | **Abbreviation** | **Competency** |
| 1 | Acquirer | ACQ | * The Acquirer is the Stakeholders representative. He is responsible for the acquisition of the System.
* The acquirer may be internal or external to the supplier organization.
* Acquisition of a product may involve, but does not necessarily require, a legal contract or a financial transaction between the acquirer and supplier. In some context the Acquirer is the end user of the system.
* Knowledge of the Stakeholders processes and ability to explain the Stakeholders requirements. The Acquirer is the role of the organization that receives the product or service. In some context the Acquirer is the end user of the system.
* The Acquirer must have the authority to approve the requirements and their changes.
* The Stakeholders includes user representatives in order to ensure that the operational environment is addressed.
* Knowledge and experience in the application domain.
 |
| 2 | Designer | DES | * Knowledge and experience in the architecture design.
* Knowledge of the revision techniques.
* Knowledge and experience in the planning and performance of integration tests.
* Knowledge of the editing techniques.
* Experience on the system development and maintenance.
 |
| 3 | Developer | DEV | * Knowledge in fabrication, development (HW, SW)
* Knowledge and experience in the application domain
 |
| 4 | IVV Engineer | IVV | * Knowledge of the Requirements, Design
* Knowledge in inspection, peer review, simulation, and review techniques
* Knowledge in testing techniques
 |
| 5 | Project Manager | PJM | Leadership capability with experience making decisions, planning, personnel management, delegation and supervision, finances and system development. |
| 6 | Stakeholder | STK | * Stakeholders are actors that have an interest in the system, all along its life cycle, such as, representatives of users, users, maintainers, security, trainers, regulatory bodies, suppliers.
* STK should have Knowledge of the Stakeholder (e.g. manufacturer, maintainer, tester, logistic) processes and ability to explain the Stakeholder requirements.
* The Stakeholder (representative) must have the authority to approve the requirements and their changes.
* Knowledge and experience in the application domain.
 |
| 7 | Supplier | SUP | Supplier of a System Element of the system: hardware, software, or hardware with software. |
| 8 | System Engineer | SYS | * Knowledge and experience eliciting, specifying and analyzing the requirements.
* Knowledge in designing user interfaces and ergonomic criteria.
* Knowledge of the revision techniques.
* Knowledge of the requirements authoring.
* Knowledge of the business domain
* Experience on system development, integration, operation and maintenance
* Experience on the system development and maintenance.
 |
| 9 | Work Team | WT | * Knowledge and experience according to their roles on the project:
	+ SYS, DES, DEV, IVV.
* Knowledge on the standards used by the Acquirer and/or by the VSE.
 |

# Product Description

There are extensive and detailed descriptions of the product development cycle found in ISO/IEC TR 29110-5-6-2:2014(E), Section 10 Product description. This information should be used in conjunction with the Deployment Package Product Deployment Systems Engineering Basic Profile.

This is an alphabetical list of the input, output and internal process products, its descriptions, possible states and the source of the product. The source can be another process or an external entity to the project, such as the Acquirer. This list is showed as a four-column table for presentation purpose only.

ISO/IEC/IEEE 15289:2011 definitions of Information Products were used to develop the Product

Descriptions of Table 23 in the ISO/IEC TR 29110-5-6-2:2014(E), Section 10 Product description.

The product status gives the information to the project team about the type of work (tasks) already done on the product (for example: evaluated, verified, tested, baselined). This information can be used to start next tasks which can use the product as an input. Some products have no status assigned because they are only informative and they do not change the content (for example: Acceptance Record, Correction Register, Project Repository Backup, Verification/Validation Results).

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