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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/IEC DIS 29110-5-1-3

Systems and software engineering — Life cycle profiles for very small entities (VSEs) —

Part 5-1-3: Software engineering guidelines for the generic Intermediate profile.

ICS: 35.080

ISO/IEC JTC 1/SC 7

Secretariat: **BIS**

Voting begins on:
2025-08-04

Voting terminates on:
2025-10-27

This document is circulated as received from the committee secretariat.

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

This first edition replaces the ISO/IEC TR 29110-5-1-3:2017.

The main changes are as follows:

- Many task statements have been reworded to facilitate their understanding.
- Conditional tasks have been added to develop optional work products (e.g. operation guide) that have been requested by a customer. This notation replaces the 'Optional' notation [e.g. *(optional)] used in the TR that caused ambiguities.
- Terms have been added to [Clause 3](#) such that this document is self-contained.
- A few terms have been modified to align this document with the updated version of standards such as the ISO/IEC/IEEE 12207 and the ISO/IEC/IEEE 15289.
- Texts have been added to task statements to provide additional information to facilitate the understanding or use of this document.

Introduction

0.1 Introduction to the ISO/IEC 29110 series

For the ISO/IEC 29110 series, a very small entity (VSE) is an enterprise, an organisation (e.g., government agency, non-profit organisation), a department or a project having up to 25 people. Many VSEs develop and/or maintain systems and the software components used in those systems, either as independent products or incorporated into the larger system. Due to this, a recognition of VSEs as suppliers of high-quality products is required.

VSEs around the world are creating valuable products and services. According to the World Bank, small and medium-sized enterprises (SMEs) account for about 90 % of enterprises worldwide. According to the Organisation for Economic Co-operation and Development (OECD), SMEs represent 99 % of all businesses and generate about 60 % of employment. Almost one person out of three is employed in a micro firm with less than 10 employees. The European Union reports that micro firms, with fewer than 10 persons, account for 93.5 % of all enterprises and small firms, with 10 to 49 employees, account for 5.5 % of all enterprises. The challenge facing governments and economies is to provide a business environment that supports the competitiveness of this large heterogeneous business population and that promotes a vibrant entrepreneurial culture.

From studies and surveys conducted, the majority of International Standards did not address the needs of VSEs. Implementation of and conformity with these standards is difficult, if not impossible.

Consequently, 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 excluded 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 effort required to apply 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 over-complex systems or software life cycle processes. To address some of these difficulties, a set of guidelines has been developed based on a set of VSE characteristics. The guidelines 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/IEEE 12207 for software; and processes, activities, tasks, and outcomes of ISO/IEC/IEEE 15288 for systems; and information products (documentation) of ISO/IEC/IEEE 15289 for software and systems.

VSEs can achieve recognition through implementing a profile and by being audited against ISO/IEC 29110 specifications.

The ISO/IEC 29110 series can be applied at any phase of system or software development within a life cycle. The ISO/IEC 29110 series is intended to be used by VSEs that do not have experience or expertise in adapting/tailoring ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288 standards to the needs of a specific project. VSEs that have expertise in adapting/tailoring ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288 are encouraged to use those standards instead of the ISO/IEC 29110 series.

The ISO/IEC 29110 series is intended to be used with any lifecycle such as waterfall, iterative, incremental, evolutionary or agile.

Systems, in the context of the ISO/IEC 29110 series, are typically composed of hardware and software components.

The ISO/IEC 29110 series, targeted by audience, has been developed to improve system or software and/or service quality, and process performance. Figure 1 describes the ISO/IEC 29110 series and positions the parts within the framework of reference.

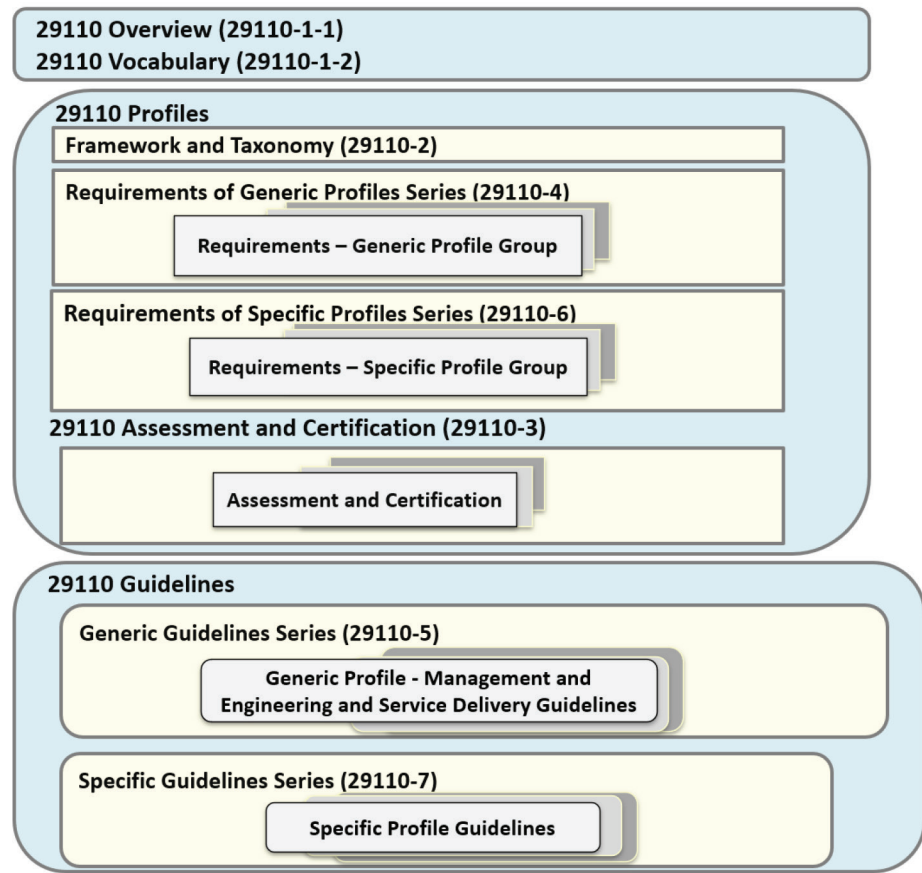


Figure 1 — ISO/IEC 29110 series

ISO/IEC 29110-1-1 introduces processes, lifecycle and standardization concepts, the taxonomy (catalogue) of ISO/IEC 29110 profiles and the ISO/IEC 29110 series. ISO/IEC 29110-1-1 also introduces the characteristics and needs of a VSE, and clarifies the rationale for specific profiles, documents, standards and guidelines. ISO/IEC 29110-1-2 defines the terms common to the ISO/IEC 29110 series. ISO/IEC 29110-1-1 and ISO/IEC 29110-1-2 are targeted at VSEs and their customers, assessors, standards producers, tool vendors and methodology vendors.

ISO/IEC 29110-2 introduces the concepts for systems and software engineering profiles for VSEs. It establishes the logic behind the definition and application of profiles. For standardized profiles, it specifies the elements common to all profiles (structure, requirements, conformance, assessment). For domain-specific profiles (profiles that are not standardised and developed outside of the ISO process), it provides general guidance adapted from the definition of standardised profiles. ISO/IEC 29110-2 is targeted at profile producers, tool vendors and methodology vendors.

ISO/IEC 29110-3 defines certification schemes, assessment guidelines and compliance requirements for process capability assessment, conformity assessments, and self-assessments for process improvements. ISO/IEC 29110-3 also contains information that can be useful to developers of certification and assessment methods and developers of certification and assessment tools. ISO/IEC 29110-3 is addressed to people who have direct involvement with the assessment process, e.g., the auditor, certification and accreditation bodies and the sponsor of the audit, who need guidance on ensuring that the requirements for performing an audit have been met. ISO/IEC 29110-3 is targeted at VSEs and their customers, assessors, accreditation bodies.

ISO/IEC 29110-4 provides the specifications for all generic profiles of the generic profile group that are based on subsets of appropriate standards elements. ISO/IEC 29110-4 is targeted at VSEs, customers, standards producers, tool vendors and methodology vendors.

ISO/IEC 29110-5 provides a management, engineering and service delivery guidelines for profiles of the generic profile group. ISO/IEC 29110-5 is targeted at VSEs and their customers.

ISO/IEC 29110-6 provides the specifications for specific profiles that are based on subsets of appropriate standards elements. ISO/IEC 29110-6 is targeted at VSEs, customers, standards producers, tool vendors and methodology vendors.

ISO/IEC 29110-7 provides a guideline for each profile of the specific profile group. ISO/IEC 29110-7 is targeted at VSEs and their customers.

If a new profile is needed, ISO/IEC 29110-4 or ISO/IEC 29110-6 can be developed with minimal impact to existing documents.

0.2 Introduction to this document

This document is the second software profile of a four-profile software engineering roadmap (i.e. Entry, Basic, Intermediate and Advanced).

This document is intended to be used by VSEs to support the software product which they developed.

This document is intended to be used by VSEs to add accessibility tasks to the software implementation process.

This document is intended to be used with any processes, techniques and methods that enhance the VSE's customer satisfaction and productivity.

The life cycle processes described in the ISO/IEC 29110 series are not intended to preclude or discourage their use by organizations larger than VSEs.

To use this document, a VSE should fulfil the following conditions:

- project agreement was documented, approved by the management of the VSE and baselined before the start of the project;
- a project feasibility study was performed before the project start;
- the project team, including project manager, is assigned and trained;
- development cycle(s) should be documented (e.g., waterfall, iterative, incremental, evolutionary, agile);
- goods, services and infrastructure to start the project are available.

Using this document, a VSE can obtain the following benefits:

- an agreed set of project requirements and expected work 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 work products is followed.

VSEs that develop systems that have software components are invited to use the systems engineering Basic profile guidelines of the ISO/IEC 29110 series (i.e. ISO/IEC 29110-5-6-2).

In this document, [Annex A](#) provides a set of deployment package to facilitate incremental adoption of best practices, allowing VSEs to enhance their capabilities in a manageable and adaptable way.

Conformity requirements for implementations of this document can be found in ISO/IEC 29110-4-1.

Systems and software engineering — Life cycle profiles for very small entities (VSEs) —

Part 5-1-3:

Software engineering guidelines for the generic Intermediate profile.

1 Scope

This document provides management and engineering guidelines to the software intermediate profile specified in ISO/IEC 29110-4-1 through project management and software implementation processes.

This document applies to VSEs that do not develop safety critical software.

This document applies for software development projects, which can fulfil an external or internal agreement.

This document is applicable to VSEs developing a single product by a single work team.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

accessibility

extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use

3.2

activity

set of cohesive tasks of a process

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.3]

3.3

advanced profile

profile targeted at VSEs which want to sustain and grow as an independent competitive system and/or software development business

[SOURCE: ISO/IEC 29110-1-2:2024]

3.4

agreement

mutual acknowledgement of terms and conditions under which a working relationship is conducted

EXAMPLE Contract, memorandum of agreement.

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.5]

3.5

baseline

formally approved version of a configuration item, regardless of media, formally designated and fixed at a specific time during the configuration item's life cycle

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.12]

3.6

basic profile

profile targeted at VSEs developing a single product by a single work team

[SOURCE: ISO/IEC 29110-1-2:2024, 4.14]

3.7

conditional process

process that may be mandatory under some specified conditions, may be optional under other specified conditions, and may be out of scope or not applicable under other specified conditions

Note 1 to entry: These are to be observed if the specified conditions apply.

[SOURCE: ISO/IEC 29110-5-1-2:2024, 3.10]

3.8

conditional task

task that can be mandatory under some specified condition(s), can be optional under other specified conditions, and can be out of scope or not applicable under other specified conditions

Note 1 to entry: These are to be observed if the specified condition(s) apply.

[SOURCE: ISO/IEC 29110-1-2:2024, 3.28]

3.9

customer

person or organization that could or does receive a product or a service that is intended for or required by this person or organization

EXAMPLE Consumer, client, end-user, retailer, receiver of product or service from an internal process, beneficiary and purchaser.

Note 1 to entry: A customer can be internal or external to the organization.

[SOURCE: ISO 9000:2015, 3.2.4, modified - added 'service']

3.10

defect

imperfection or deficiency in a work product where that work product does not meet its requirements or specifications and needs to be either repaired or replaced

[SOURCE: IEEE 1044:2009, IEEE dictionary]

3.11

deployment package

DP

set of artefacts developed to facilitate the implementation of a set of practices, of the selected framework, in a very small entity

[SOURCE: ISO/IEC 29110-1-2:2024, 4.24]

3.12

Entry profile

profile targeted at start-up VSEs (i.e. VSEs who started their operation fewer than three years ago) and/or at VSEs working on a single small project (e.g. project size of less than 6 person-months)

[SOURCE: ISO/IEC 29110-1-2:2024, 3.40]

3.13

expected result

observable predicted behaviour of the test item under specified conditions based on its specification or another source

[SOURCE: ISO/IEC/IEEE 29119-1:2022, 3.35]

3.14

generic profile group

profile group applicable to VSEs (very small entities) that do not develop business critical systems or software products

[SOURCE: ISO/IEC 29110-1-2:2024]

3.15

intermediate profile

profile targeted at VSEs involved in the development of more than one project in parallel with more than one work team

[SOURCE: ISO/IEC 29110-1-2:2024]

3.16

integration testing

testing in which software components, hardware components, or both are combined and tested to evaluate the interaction among them

[SOURCE: ISO/IEC/IEEE 24765:2017, 3.2034, modified — Note 1 to entry has been removed.]

3.17

process

set of interrelated or interacting activities that transforms inputs into outputs

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.43]

3.18

process purpose

high-level objective of performing the process and the likely outcomes of effective implementation of the process

[SOURCE: ISO/IEC/IEEE 24774:2021, 3.12]

3.19

process outcome

observable result of the successful achievement of the process

[SOURCE: ISO/IEC/IEEE 24774:2021, 3.11]

3.20 profile

subset of appropriate standards' processes and their outcomes, activities and tasks combined to accomplish a particular function

Note 1 to entry: The base standards used to develop profiles for VSEs are the ISO/IEC/IEEE 12207, the ISO/IEC/IEEE 15288 and the ISO/IEC/IEEE 15289

[SOURCE: ISO/IEC 29110-1-2:2024]

3.21 project

endeavour with defined start and finish dates undertaken to create a product or service in accordance with specified resources and requirements

Note 1 to entry: A project is sometimes viewed as a unique process comprising coordinated and controlled technical management and technical activities.

Note 2 to entry: Continuous development approaches such as agile and DevOps can create products and services without the defined start and finish criteria of projects.

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.47]

3.22 report

information item that describes the results of activities such as investigations, observations, assessments, or tests

[SOURCE: ISO/IEC/IEEE 15289:2019, 3.1.22]

3.23 review

process or meeting during which a work product, or set of work products, is presented to project personnel, managers, users, customers, or other interested parties for comment or approval

[SOURCE: ISO/IEC 29110-1-2:2024, 4.51]

3.24 risk

effect of uncertainty on objectives

Note 1 to entry: An effect is a deviation from the expected — positive and/or negative.

Note 2 to entry: Objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process).

Note 3 to entry: Risk is often characterized by reference to potential events and consequences, or a combination of these.

Note 4 to entry: Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence.

Note 5 to entry: Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood.

[SOURCE: ISO Guide 31073:2022, 3.1.1]

3.25 requirement

statement that translates or expresses a need and its associated constraints and conditions

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.56, modified — Notes to entry have been removed.]

3.26

security

protection against intentional subversion or forced failure

Note 1 to entry: Security includes authenticity, accountability, confidentiality, integrity, availability, nonrepudiation, and reliability, all of which have the related issue of their assurance.

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.61]

3.27

small and medium-sized enterprise

SME

enterprises with less than 250 persons employed

[SOURCE: ISO/IEC 29110-1-2:2024]

3.28

software product

set of computer programs, procedures, and possibly associated documentation and data

Note 1 to entry: A software product is a software system viewed as the output product resulting from a process

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.68, modified — Note 1 to entry has been added.]

3.29

stakeholder

individual or organization having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations

EXAMPLE Users, end user organizations, supporters, developers, customers, producers, trainers, maintainers, disposers, acquirers, suppliers, regulatory bodies, and people influenced positively or negatively by a system

Note 1 to entry: Some stakeholders can have interests that oppose each other or oppose the system.

Note 2 to entry: Stakeholders include those who are affected or impacted by a system.

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.73, modified — EXAMPLE and note 1 to entry have been added.]

3.30

task

required, recommended, or permissible action, intended to contribute to the achievement of one or more outcomes of a process

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.80]

3.31

test item

work product that is an object of testing

[SOURCE: ISO/IEC/IEEE 29119-1:2022, 3.107]

3.32

test result

indication of whether or not a specific test case has passed or failed, i.e. if the actual result observed as test item output corresponds to the expected result or if deviations were observed

[SOURCE: ISO/IEC/IEEE 29119-1:2022, 3.122]

3.33

testing

set of activities conducted to facilitate discovery and/or evaluation of properties of one or more test items

[SOURCE: ISO/IEC/IEEE 29119-1:2022, 3.131]

3.34

traceability

association established between two or more logical entities, especially entities having a predecessor-successor or primary-secondary relationship to one another, such as requirements, system elements, verifications, or tasks

EXAMPLE Software features and test cases are typically traced to software requirements.

[SOURCE: ISO/IEC/IEEE 12207:XXXX, 3.1.83]

3.35

validation

confirmation, through the provision of objective evidence, that the requirements (3.1.56) for a specific intended use or application have been fulfilled

Note 1 to entry: In a life cycle context, validation involves the set of activities for gaining confidence that a system is able to accomplish its intended use, goals, and objectives in an environment like the operational environment. The right system was built.

[SOURCE: ISO 9000:2015, 3.8.13, modified — Notes 1 to 3 to entry have been removed; a new Note 1 to entry has been added.]

3.36

verification

confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

Note 1 to entry: Verification is a set of activities that compares a system or system element against the required characteristics. This includes, but is not limited to specified requirements, design, descriptions, and the system itself. The system was built right.

[SOURCE: ISO 9000:2015, 3.8.12, modified — Notes 1 to 3 to entry have been replaced by a new note 1 to entry.]

3.37

version control

establishment and maintenance of baselines and the identification and control of changes to baselines that make it possible to return to the previous baseline

[SOURCE: ISO/IEC/IEEE 26511:2018, 3.1.40]

3.38

very small entity

VSE

enterprise, organization (e.g. government agency, non-profit organization), department or project having up to 25 people

[SOURCE: ISO/IEC 29110-1-2:2024, 4.71, modified — "(e.g. government agency, non-profit organization)" has been added.]

3.39

work product

WP

artefact produced by a process

EXAMPLE Project plan, requirements specification, design documentation, source code, test meeting minutes, schedules, budgets.

Note 1 to entry: A subset of the work products can be baselined to be used as the basis of further work and some form the set of project deliverables.

[SOURCE: ISO/IEC 20246:2017, 3.20]

4 Conventions and abbreviated terms

4.1 General

Conventions for naming, diagramming, describing and defining profiles are defined in ISO/IEC 29110-2-1:2015.

4.2 Naming, diagramming and definition conventions

The following process structure description and notation are used to describe the processes.

Process name – process identifier, followed by its abbreviation in parenthesis “()”.

Process purpose – high-level objective of performing the process and the likely outcomes of effective implementation of the process.

Process outcomes – observable result of the successful achievement of the process purpose. Outcomes are identified by the abbreviation of the process name, followed by the letter “O” and a consecutive number, for example PM.O1, SI.O2.

Input work products – Work products (WP) which can be used to perform the process and its corresponding source, which can be another process or an external entity to the project, such as the customer. Identified by the abbreviation of the process name.

Output work products – Work products generated by the process and its corresponding destination, which can be another process or an external entity to the project, such as customer. Identified by the abbreviation of the process name.

Internal work products – Work products generated (i.e. output work product) and consumed (i.e. input work product) by the process. An internal work product is not reviewed or approved by the customer.

All work products’ names initiate with capital letters. Some work products should have one or more statuses attached to the work product name surrounded by square brackets “[]” and separated by “,”. The work product state may change during the process execution. See [Clause 11](#) for the alphabetical list of the work products, its descriptions, possible states and the source of the work product. The source can be another process or an external entity to the project, such as the customer.

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 tables. See [Clause 10](#) for the alphabetical list of the roles, its abbreviations and recommended 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 work 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 work products. The notation used in the diagrams does not imply the use of any specific process life cycle.

Activity – A set of cohesive tasks of a process. The task statements in this guideline are not imperative. A process activity is the first level of process workflow decomposition, and the second one is a task. Activities are identified by a 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 process outcomes surrounded by parenthesis “()”. For example, PM.O1 project planning (contributes to PM.O1, PM.O5, PM.O6, PM.O7) means that the activity PM.O1 project planning contributes to the achievement of the listed objectives: PM.O1, PM.O5, PM.O6 and PM.O7.

Task description – Each task description begins with an active verb (e.g. assign, test) and is followed by an object (e.g. review the project plan). To facilitate their implementation, a few tasks are broken down in elementary tasks. 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.

Tasks description table contains four columns corresponding to:

- Role: the abbreviation of role(s) involved in the task execution.
- Task: description of the task to be performed. Each task is identified by activity ID and consecutive number, for example PM.01.01, PM.01.02, and so on. A few 'Notes' are added to provide additional information intended to assist the understanding or use of tasks. Each 'Note' is numbered using the following notation x).
- Input work products: work products needed to execute the task.
- Output work products: work products created or modified by the execution of the task.

NOTE 1 A conditional task is executed if its associated work product (e.g. software user documentation) is required by the customer and listed in the delivery instructions. The conditional task statement is preceded with this text: "x) Conditional task:".

Incorporation to project repository – list of work products to be saved in the project repository; the version control strategy should be applied to some of them. A few work products (e.g. requirements) are baselined, a change to a baselined work product can be done through an approved change request.

NOTE 2 Tables used in process description are for presentation purposes only.

NOTE 3 The term 'Basic' is using a capital 'B' to indicate an ISO/IEC 29110 profile (e.g., the Basic profile) while the term 'basic' is used when referring to the most important part of something (e.g., basic principles).

NOTE 4 A work product is baselined when it should be approved and uploaded in the repository.

4.3 Notation used to document new processes, additions and modifications to the Basic profile processes

The Intermediate profile is the third profile of a four-profile roadmap (i.e. Entry, Basic, Intermediate and Advanced). The Intermediate profile has been designed to build upon the processes of the Basic profiles such that, when moving from the Basic profile to the Intermediate profile, a VSE has to add to its existing Basic profile processes the new processes (e.g. objectives, activities, tasks, roles and work products) described in this document.

Since, in the Intermediate profile, there are additions and modifications to the Basic profile processes, this document has been written such that it will be easy for a VSE to identify these additions and modifications. The project management (PM) and software implementation (SI) processes, of the Basic profile, have been complemented with additional objectives, tasks and work products in a context where a VSE is conducting more than one project in parallel with more than one work team. The following notation is used to highlight the addition/deletion/modification to the Basic profile:

- added text:
- is underlined;
- except for the processes of the Intermediate profile;
- deleted/modified text is strike out as follows: ~~the text is stroked out~~;

The Intermediate profile has two new processes that are not in the Basic profile: the business management (BM) process and a conditional process, the acquisition management (AM) process. The execution of the AM process is required only if a product/service needs to be obtained from an external Supplier by a VSE. To facilitate the identification of additional abbreviations, roles and work products of the BM and AM processes of the Intermediate profile, these items are underlined. To facilitate reading, the BM and AM processes have not been underlined.

The Intermediate profile terminology has been aligned with ISO/IEC/IEEE 12207 and ISO/IEC/IEEE 15289. The following terms of old standards have been replaced with the new terms:

- "agreement" and "contract" have been replaced with "agreement";

- work products are identified with a unique code WP.XX where XX is a sequential number in [Clause 11](#). These codes have not been used in the descriptions of activities and tasks to facilitate readability.

4.4 Abbreviated terms

AM	acquisition management
BM	Business management
BSM	business manager
OLR	organizational lessons learned record
OR	organizational repository
PJM	project manager
PLR	project lessons learned record
PO	purchase order
RFP	request for proposal
RR	resource request
SUP	supplier
VSE	very small entity

5 Overview

The Intermediate profile management and engineering guidelines applies to a very small entity (VSE) which are familiar with or have implemented the software Basic guidelines (ISO/IEC 29110-5-1-2) for their software development projects.

This document provides organizational management, project management, software implementation and acquisition processes which integrate practices mainly based on the selection of ISO/IEC/IEEE 12207 and ISO/IEC/IEEE 15289 standards elements. [Annex A](#) provides information about deployment packages that facilitate the implementation of these processes.

[Table 1](#) illustrates the 4-stage software engineering roadmap. The 1st column on the left lists the 2 processes of the ISO/IEC 29110-5-1-1 Entry profile. The list of processes of the ISO/IEC 29110-5-1-2 Basic profile of the 2nd column is incrementally built from the left column, so that the processes for the 2nd column are all the ones from the Entry profile plus a conditional process, new tasks and new work products. The list of the processes of the Intermediate profile of the 3rd column are the processes in the second column plus two new processes. The list of the process of the Advanced profile of the 4th column are the processes in the 3rd column plus one new process.

Table 1 — Software engineering 4-stage roadmap

ISO/IEC 29110-5-1-1 Entry profile	ISO/IEC 29110-5-1-2 Basic profile	ISO/IEC 29110-5-1-3 Intermediate profile	ISO/IEC 29110-5-1-4 Advanced profile
— software implementation process — project management process	Processes of ISO/IEC 29110-5-1-1 and: — additional tasks and work products	Processes of ISO/IEC 29110-5-1-2 and: — business management — support process	Processes of ISO/IEC 29110-5-1-3 and: — conditional process: software transition and disposal process

This document is intended to be used by VSEs to establish processes to implement any development approach or methodology including for example, agile, evolutionary, incremental, test-driven development, etc. based on a VSE or project needs.

The purpose of the business management (BM) process is to identify opportunities, evaluate all in-place agreements or requests from customers for fit with organisational goals and resources, obtain and provide the VSE with the necessary resources to perform all projects, monitor and evaluate all projects, conduct lessons learned to improve the VSE and protect its intellectual property and the security of its assets and information items.

The purpose of the project management (PM) process is to establish and carry out in a systematic way the tasks of the software implementation process, which allows complying with the project's objectives in the expected quality, time and costs.

The purpose of the software implementation (SI) process is the systematic performance of the analysis, design, construction, integration and test activities for new or modified software work products according to the specified requirements.

The purpose of the acquisition management (AM) process, a conditional process, is to obtain products and/or services required by the VSE. The execution of the AM process is only required if a product/service needs to be obtained from a supplier by the VSE, i.e. a conditional process.

The purpose of the support process is to establish and carry out in a systematic way the ongoing support of the software product delivered to a VSE's customer, so as to deliver a support service to the customer as part of an agreement. This involves activities such as service level management to specify and supervise the support service and maintain good customer relationships, incident management to handle customer support communications, record and restore service, and production change management to manage/minimize the risks associated with delivering production software changes through planning, testing, control and communication. Please refer to the support process described in [Annex B](#).

The processes are interrelated (see [Figure 2](#)). The arrow connecting the AM process to the other processes is dashed to indicate that this process is a conditional process.

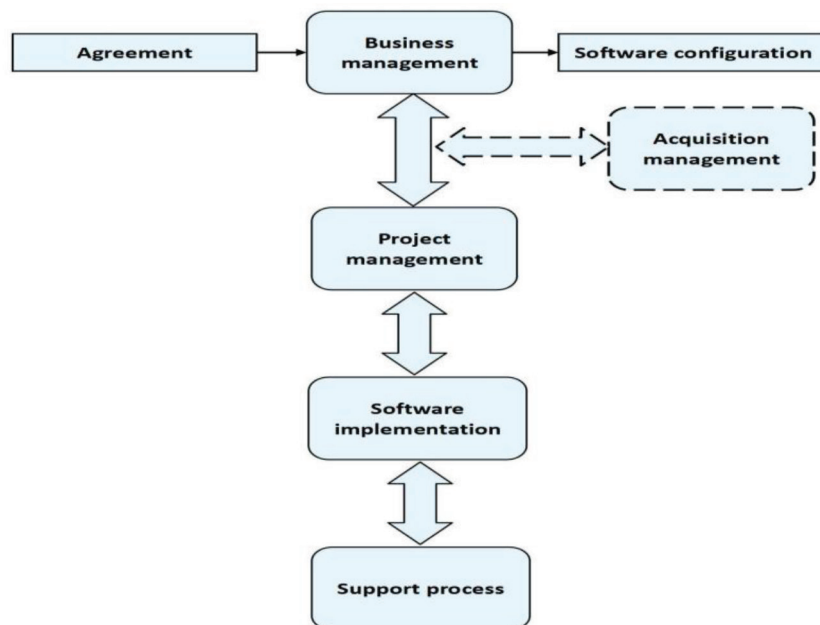


Figure 2 — Processes of the Intermediate profile

6 Business management (BM) process

6.1 BM process purpose

The purpose of the business management process is to identify opportunities, evaluate all in-place agreements or requests from customers for fit with organizational objectives and resources, obtain and provide the VSE with the necessary resources to perform all projects, monitor and evaluate all projects, conduct lessons learned to improve the VSE and protect its intellectual property and the security of its assets and information items.

This document is intended to be used by a VSE to establish processes to implement any development approach or methodology including, for example, agile, evolutionary, incremental, test-driven development based on the VSE or project needs.

6.2 BM process outcomes

- BM.01. Initiate and sustain necessary, sufficient and suitable projects to meet the objectives of the VSE.
- BM.02. Provide to the customer the work product that meets the agreed requirements.
- BM.03. Provide the VSE with necessary human resources and to maintain their competencies, consistent with business needs.
- BM.04. Provide an enabling infrastructure and services to all projects to support the VSE and the project objectives throughout the life cycle.
- BM.05. Collect and analyse measures of all projects and to improve or maintain the management and engineering processes of the VSE.
- BM.06. Protect the intellectual property and the security of the assets and information items of the VSE.
- BM.07. Establish an organizational repository, integrate and store the projects' relevant documentation. The organizational repository has to protect the security of its assets and information items.

6.3 BM roles involved

[Table 2](#) provides a list of roles involved in the BM process.

Table 2 — BM roles involved

Role	Abbreviation
Business manager	BSM
Project manager	PJM
Customer	CUS

6.4 BM process description

6.4.1 BM process diagram

[Figure 3](#) shows the flow of information between the business management process activities including the most relevant work products and their relationships.

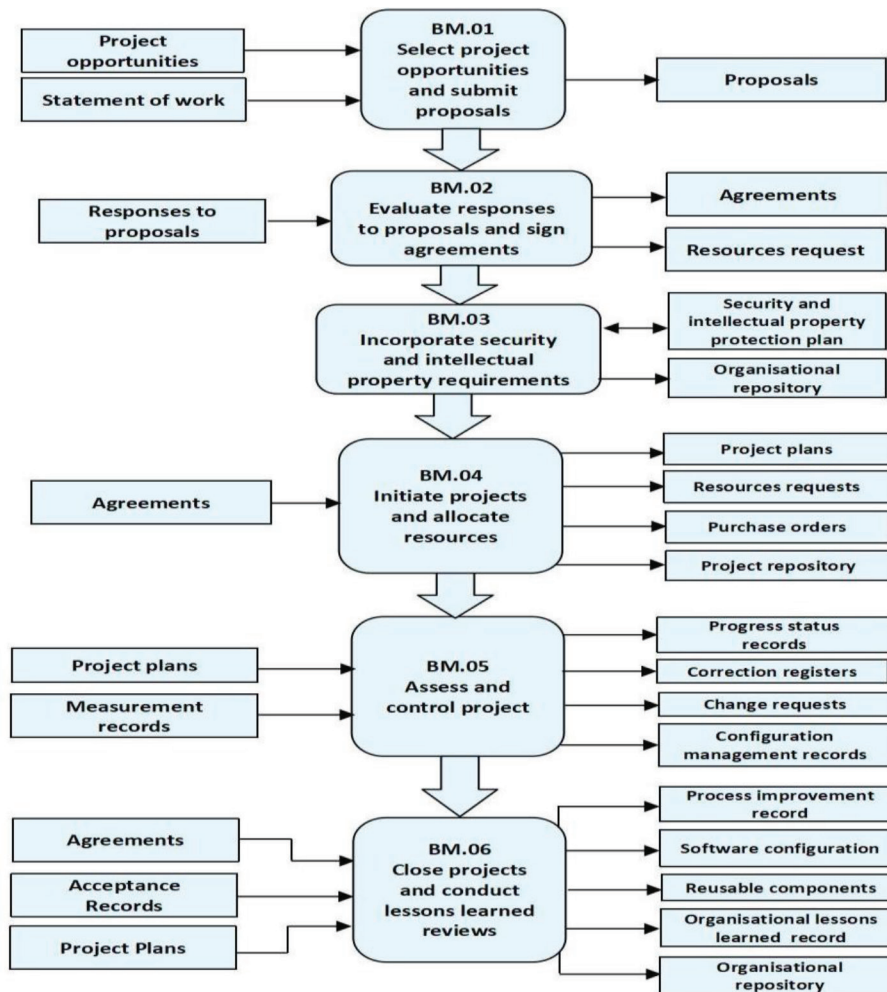


Figure 3 — Business management process diagram

6.4.2 BM process activities

The business management process has the following activities:

- BM.01. Select project opportunities and submit proposals;
- BM.02. Evaluate responses to proposals and sign agreements;
- BM.03. Incorporate security and intellectual property requirements;
- BM.04. Initiate projects and allocate resources;
- BM.05. Conduct periodic project assess and control projects;
- BM.06. Close projects and conduct lessons learned reviews.

6.4.2.1 BM.01 Select project opportunities and submit proposals (contributes to outcome BM.01)

The select project opportunities and submit proposals activity describes the tasks and information items needed to document project opportunities and proposals sent to potential customers.

The activity provides:

- project opportunities, and

— proposals submitted to potential customers.

The list of tasks of activity BM.01 is given in [Table 3](#).

Table 3 — BM.01 task list

Role	Task list	Input work products	Output work products
BSM PJMs	BM.01.01 Document project opportunities. 1) Agreements (e.g. contracts) and a statement of work from past projects could be used to document the project opportunities.	Statements of work [preliminary] Agreements [preliminary]	Project opportunities [initiated]
BSM PJMs	BM.01.02 Select project opportunities.	Project opportunities [updated]	Project opportunities [approved]
BSM PJMs	BM.01.03 Prepare and approve proposals. 1) Proposals could be developed using the proposal template in the work product description section of this document.	Project opportunities [approved]	Proposal [approved]
BSM PJMs	BM.01.04 Submit proposals to potential customers.	Proposal [approved]	Proposal [submitted]

6.4.2.2 BM.02. Evaluate responses to proposals and sign agreements (contributes to outcome BM.01)

The evaluate responses to proposals and sign agreements activity involves the evaluation of the responses to proposals received from customers, the negotiation and signature of agreements with customers. Once an agreement is signed, a project manager is assigned to the project and the project manager documents its project plan.

The activity provides:

- request for proposal(s), and
- agreements.

The list of tasks of activity BM.02 is given in [Table 4](#).

Table 4 — BM.02 task list

Role	Task list	Input work products	Output work products
BSM	BM.02.01 Evaluate all responses to proposals from potential customers and prepare agreements for the accepted proposals.	Proposals [submitted]	Agreement [initiated]
BSM CUS	BM.02.02 Negotiate, finalize and sign all agreements with customers.	Agreement [initiated]	Agreement [approved]
BSM PJMs	BM.02.03 Approve projects and assign project managers to develop project plans and resources requests. 1) Update project opportunities (if applicable). 2) Project plans are developed according to the planning activity of the pm process.	Agreement [approved]	Projects managers [assigned] Project opportunities [updated]

6.4.2.3 BM.03 Incorporate security and intellectual property requirements (contributes to outcome BM.06)

The incorporate security and intellectual property requirements activity documents the tasks and information items needed to develop and implement security of its assets and information items and the protection of the intellectual property of the VSE.

The activity provides:

- security and Intellectual property protection plan, and
- organisational repository to store assets and information items securely.

The list of tasks of BM.03 is given in [Table 5](#).

Table 5 — BM.03 task list

Role	Task list	Input work products	Output work products
BSM	BM.03.01 Develop a security and intellectual property protection plan using the template provided in the work product description table.	Business objectives [approved]	Security and intellectual property protection plan [initiated]
BSM PjMs	BM.03.02 Review and approve the security and intellectual property protection plan. 1) The security and intellectual property protection plan is approved by the BSM.	Security and intellectual property protection plan [initiated]	Security and intellectual property protection plan [approved]
BSM PjMs	BM.03.03 Implement the security and intellectual property protection plan.	Security and intellectual property protection plan [approved]	Security and intellectual property protection plan [implemented]
BSM	BM.03.04 Establish and maintain an organisational repository. 1) The repository has to protect the security and intellectual property of the VSE and its customers.	Security and intellectual property protection plan [approved]	Organisational repository [established]

6.4.2.4 BM.04. Initiate projects and allocate resources (contributes to outcome BM.03, BM.03, BM.07)

The initiate projects and allocate resources activity is initiated with the approval of project plans and the resources requests. Human resources are allocated to projects. If products or services have to be acquired, purchase orders are approved. A project repository is established.

The activity provides:

- approved project plans,
- approved resources requests,
- approved purchased orders, and
- human resource record.

The list of tasks of activity BM.04 is given in [Table 6](#).