

Software and Systems Engineering Processes — Requirements and Evaluation

Part 1

Agreement processes — Acquisition and Supply

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Foreword

This Standard was prepared by the KEBS Technical Committee 94 on Software Engineering, IT Service Management, IT Governance and Artificial Intelligence, under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

The complexity of software systems has increased to an unprecedented level. This has led to new opportunities, but also to increased challenges for the organizations that create and utilize systems. These challenges exist throughout the life cycle of a system and at all levels of architectural detail. This document provides a common process framework for describing the processes within the life cycle of systems created by humans, adopting a Software Engineering approach. This framework provides for the assessment and improvement of the processes.

Organizations are producers and users of software systems. One organization (acting as an acquirer) can task another (acting as a supplier) for products or services. This is achieved using agreements. Agreements allow both acquirers and suppliers to realize value and support business strategies for their organizations.

The Agreement processes are organizational processes that apply outside of the span of a project's life, as well as for a project's lifespan. Generally, organizations act simultaneously or successively as both acquirers and suppliers of software systems. The Agreement processes can be used with less formality when the acquirer and the supplier are in the same organization. Similarly, they can be used within the organization to agree on the respective responsibilities of organization, project and technical functions.

During the preparation of this standard, reference was made to the following documents:

- i) ISO/IEC/IEEE 12207:2017
- ii) ISO/IEC/IEC 15288:2015

Acknowledgement is hereby made for the assistance derived from these sources.

Software and Systems Engineering Processes — Requirements and Evaluation

— Part 1 — Agreement processes — acquisition and supply

1 Scope and application

1.1 Scope

This standard specifies the requirements for acquisition, supply processes within the in software and system engineering life cycle and determines evaluation criteria for conformance to these requirements.

1.2 Application

This Standard does not apply to the technical processes within the software lifestyle cycle.

Although this Kenya Standard does not establish a management system, it is intended to be compatible with the quality management system provided by ISO 9001, the service management system provided by ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013), and the information security management system provided by ISO/IEC 27000.

2 Conformance

2.1 Full conformance

2.1.1 Full conformance to outcomes

A claim of full conformance declares the set of processes for which conformance is claimed. Full conformance to outcomes is achieved by demonstrating that all of the outcomes of the declared set of processes as prescribed in **Clause 4** have been achieved. In this situation, the provisions for activities and tasks of the declared set of processes in **Annex A** of this standards are guidance rather than requirements.

2.1.2 Full conformance to tasks

A claim of full conformance declares the set of processes for which conformance is claimed. Full conformance to tasks is achieved by demonstrating that all of the requirements of the activities and tasks of the declared set of processes in **Annex A** of this standard have been achieved. In this situation, the provisions for the outcomes of the declared set of processes in **Clause 4** are guidance rather than requirements.

NOTE A claim of full conformance to tasks may be appropriate in contractual situations where an acquirer or a regulator requires detailed understanding of the suppliers' processes.

3 Terms, definitions Acronyms and Abbreviations

For the purpose of this standard, the definitions given in part 1, IEC 60050-3300 and IEEE 100, and those below apply.

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org>
- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEEE Standards Dictionary Online: available at <http://ieeexplore.ieee.org/xpls/dictionary.jsp>

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Definitions for other terms typically can be found in ISO/IEC/IEEE 24765, *System and software engineering — Vocabulary*, available at <www.computer.org/sevocab>.

3.1.1

acquirer

stakeholder that acquires or procures a product or service from a supplier

Note 1 to entry: Other terms commonly used for an acquirer are buyer, customer, owner, purchaser or internal/organizational sponsor.

3.1.2

acquisition

process of obtaining a system, product or service

3.1.3

activity

set of cohesive tasks of a process

3.1.4

agreement

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

EXAMPLE Contract, memorandum of agreement.

3.1.5

audit

independent examination of a work product or set of work products to assess compliance with specifications, standards, contractual agreements, or other criteria

3.1.6

business process

partially ordered set of enterprise activities that can be executed to achieve some desired end-result in pursuit of a given objective of an organization

3.1.7

customer

organization or person that receives a product or service

EXAMPLE Consumer, client, user, acquirer, buyer, or purchaser.

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

3.1.8

infrastructure

hardware and software environment to support computer system and software design, development, and modification

3.1.9

life cycle

evolution of a system, product, service, project or other human-made entity from conception through retirement

3.1.10

organization

group of people and facilities with an arrangement of responsibilities, authorities and relationships

EXAMPLE company, corporation, firm, enterprise, institution, charity, sole trader, association, or parts or combination thereof.

Note 1 to entry: An identified part of an organization (even as small as a single individual) or an identified group of organizations can be regarded as an organization if it has responsibilities, authorities and relationships. A body of persons organized for some specific purpose, such as a club, union, corporation, or society, is an organization.

3.1.11

party

organization entering into an agreement

Note 1 to entry: In this document, the agreeing parties are called the acquirer and the supplier.

3.1.12

problem

difficulty, uncertainty, or otherwise realized and undesirable event, set of events, condition, or situation that requires investigation and corrective action

3.1.13

process

set of interrelated or interacting activities that transforms inputs into outputs

3.1.14

process outcome

observable result of the successful achievement of the process purpose

3.1.15

process purpose

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

Note 1 to entry: The purpose of implementing the process is to provide benefits to the stakeholders.

3.1.16

product

result of a process

Note 1 to entry: There are four agreed generic product categories: hardware (e.g., engine mechanical part); software (e.g., computer program procedures, and possibly associated documentation and data); services (e.g., transport); and processed materials (e.g., lubricant). Hardware and processed materials are generally tangible products, while software or services are generally intangible.

3.1.17

project

endeavour with defined start and finish criteria 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 activities and composed of activities from the Technical Management processes and Technical processes defined in this document.

3.1.18

quality management

coordinated activities to direct and control an organization with regard to quality

3.1.19

requirement

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

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[SOURCE: ISO/IEC/IEEE 29148:2011, modified, NOTE has been removed.]

3.1.20

resource

asset that is utilized or consumed during the execution of a process

Note 1 to entry: Resources include those that are reusable, renewable or consumable.

EXAMPLE diverse entities such as funding, personnel, facilities, capital equipment, tools, and utilities such as power, water, fuel and communication infrastructures.

3.1.21

service

performance of activities, work, or duties

Note 1 to entry: A service is self-contained, coherent, discrete, and can be composed of other services.

Note 2 to entry: A service is generally an intangible product.

3.1.22

software engineering

application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software

3.1.23

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.

3.1.24

software system

system for which software is of primary importance to the stakeholders

Note 1 to entry: In the most general case, a software system is comprised of hardware, software, people, and manual procedures.

Note 2 to entry: In a software system, software is the leading driver in meeting system requirements.

3.1.25

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 End users, end user organizations, supporters, developers, producers, trainers, maintainers, disposers, acquirers, supplier organizations and regulatory bodies.

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

3.1.26

supplier

organization or an individual that enters into an agreement with the acquirer for the supply of a product or service

Note 1 to entry: Other terms commonly used for supplier are contractor, producer, seller, or vendor.

Note 2 to entry: The acquirer and the supplier sometimes are part of the same organization.

3.1.27

system

combination of interacting elements organized to achieve one or more stated purposes

Note 1 to entry: A system is sometimes considered as a product or as the services it provides.

Note 2 to entry: In practice, the interpretation of its meaning is frequently clarified by the use of an associative noun, e.g., aircraft system or database management system. Alternatively, the word “system” is substituted simply by a context dependent synonym, e.g., aircraft or database, though this potentially obscures a system principles perspective.

Note 3 to entry: A system can include the associated equipment, facilities, material, software, firmware, technical documentation, services and personnel required for operations and support to the degree necessary for use in its intended environment.

Note 4 to entry: See for comparison: enabling system, system-of-interest, system of systems.

3.1.28

systems engineering

interdisciplinary approach governing the total technical and managerial effort required to transform a set of stakeholder needs, expectations, and constraints into a solution and to support that solution throughout its life.

3.1.29

task

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

4 Requirements for Agreement processes

This subclause specifies the requirements for the establishment of agreements with organizational entities external and internal to the organization.

The Agreement Processes consist of the following:

- i) **Acquisition process** – used by organizations for acquiring products or services;
- ii) **Supply process** – used by organizations for supplying products or services.

These processes define the activities necessary to establish an agreement between two organizations. If the Acquisition process is invoked, it provides the means for conducting business with a supplier. This may include products that are supplied for use as an operational system, services in support of operational activities, or elements of a system being provided by a supplier. If the Supply process is invoked, it provides the means for an agreement in which the result is a product or service that is provided to the acquirer.

4.1 Acquisition process

4.1.1 The purpose of the Acquisition process is to obtain a product or service in accordance with the acquirer's requirements.

NOTE As part of this process, the agreement is modified when a change request is agreed to by both the acquirer and supplier.

4.1.2 This process determines the scope of the project management and technical activities, identifies process outputs, tasks and deliverables, establishes schedules for task conduct, including achievement criteria, and required resources to accomplish tasks. This is an ongoing process that continues throughout a project, with regular revisions to plans.

SL No.	Sub Process	outcomes	Requirement element	Reference
1.	Prepare for the acquisition	▪ A request for supply has been prepared.	▪ Request for Supply	▪ IEEE Std 1062-2015, IEEE Recommended Practice for Software Acquisition
2.	Advertise the acquisition and select the supplier	▪ One or more suppliers have been selected	▪ Supplier Selection Report	
3.	Establish and maintain an agreement	▪ An agreement has been established between the acquirer and supplier	▪ Agreement	
4.	Monitor the agreement	▪ Acquirer obligations have been defined in the agreement are satisfied	▪ Agreement Change Management Agreement Change Report Procedure	
5.	Accept the product or service.	▪ A product or service complying with the agreement has been accepted	▪ Supply Assessment Report ▪ Delivery Acceptance Report	

4.2 Supply process

4.2.1 The purpose of the Supply process is to provide an acquirer with a product or service that meets agreed requirements.

NOTE As part of this process, the agreement is modified when a change request is agreed to by both the acquirer and supplier.

SL No.	Sub Process	Outcomes	Requirement	Reference
1.	Prepare for the supply	<ul style="list-style-type: none">An acquirer for a product or service is identified	Supply Response	<ul style="list-style-type: none">
2.	Respond to a tender	<ul style="list-style-type: none">A response to the acquirer's request is produced	proposal, tender	
3.	Establish and maintain an agreement	<ul style="list-style-type: none">An agreement is established between the acquirer and supplier.	<ul style="list-style-type: none">Agreement Change Management Procedure	
4.	Execute the agreement.	<ul style="list-style-type: none">Supplier obligations defined in the agreement are satisfied	<ul style="list-style-type: none">Agreement Change Requests	
5.	Deliver and support the product or service.	<ul style="list-style-type: none">A product or service is provided.Responsibility for the acquired product or service, as directed by the agreement, is transferred.	<ul style="list-style-type: none">Supply Delivery Records	
NOTE Agreements can specify the conditions under which the agreement will be terminated by either party, e.g., unexpected changes in strategy or available funding, or lack of satisfactory progress.				

Annex A

(normative)

Evaluation of conformance to Agreement processes

Process	Not Performed	Partially/ Informally performed	Planned and tracked	Well Defined	Exemption/ Justification	Reference/ standard
Effective Rating	0	1	2	3		
Acquisition process						
Define a strategy for how the acquisition will be conducted						
Prepare a request for the supply of a product or service that includes the requirements.						
Communicate the request for the supply of a product or service to potential suppliers.						
Select one or more suppliers.						
Develop an agreement with the supplier that includes acceptance criteria.						
Identify necessary changes to the agreement.						
Evaluate impact of changes on the agreement						
Negotiate the agreement with the supplier.						
Update the agreement with the supplier, as necessary						
Assess the execution of the agreement						
Provide data needed by the supplier and resolve issues in a timely manner						

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Process	Not Performed	Partially/ Informally performed	Planned and tracked	Well Defined	Exemption/ Justification	Reference/ standard
Effective Rating	0	1	2	3		
Confirm that the delivered product or service complies with the agreement.						
Provide payment or other agreed consideration.						
Accept the product or service from the supplier, or other party, as directed by the agreement.						
Close the agreement.						
Supply process						
Determine the existence and identity of an acquirer who has a need for a product or service.						
Define a supply strategy						
Evaluate a request for the supply of a product or service to determine feasibility and how to respond..						
Prepare a response that satisfies the solicitation.						
Negotiate an agreement with the acquirer that includes acceptance criteria.						
Identify necessary changes to the agreement.						
Evaluate impact of changes on the agreement.						
Negotiate the agreement with the acquirer..						
Update the agreement with the acquirer, as necessary.						
Execute the agreement according to the established project plans						
Assess the execution of the agreement.						

Process	Not Performed	Partially/ Informally performed	Planned and tracked	Well Defined	Exemption/ Justification	Reference/ standard
Effective Rating	0	1	2	3		
Deliver the product or service in accordance with the agreement criteria.						
Provide assistance to the acquirer in support of the delivered product or service, per the agreement.						
Accept and acknowledge payment or other agreed consideration.						
Transfer the product or service to the acquirer, or other party, as directed by the agreement.						
Close the agreement.						