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Foreword

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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 ISO documents should be noted. This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*, in cooperation with the Systems and Software Engineering Standards Committee of the IEEE Computer Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The complexity of human-made systems has grown to an unprecedented level. This complexity leads to new opportunities and greater challenges for organizations that conceive, develop, industrialize, produce, maintain, utilize, recycle and dismantle enterprises, systems and software, and for various stakeholders that are impacted by these things. To address these opportunities and challenges, organizations increasingly apply concepts, principles, procedures and tools to drive better architecture strategies, make better architecture-related decisions, create more useful and effective architectures and improve architecture maturity. Architecture-related activities are not only strategic in nature; they are tactical and operational as well. Furthermore, the use of architecture frameworks, architecture description languages and generalist modeling languages have become common practice in commercial, public service, government, civil and military domains.

The concept of architecture used in this document goes beyond the case where the architecture entity is a system. Architecture is increasingly being applied to things not normally thought of as systems, including entities with system-like structure and behavior such as enterprises, services, data, business functions, mission areas, product lines, families of systems, software items, etc. This allows for a more generalized usage of the concept of architecture when the evaluation elements specified in this document are applied.

Architecture evaluations are performed for many reasons, such as:

a) determining if an entity of interest has been or is being architected in such a way that it fulfils its intended purpose (or can be changed in a way that suits a new purpose);

b) evaluating the effectiveness and suitability of an architecture towards addressing stakeholder needs and expectations;

c) identifying risks for mitigation;

d) identifying opportunities for the improvement of an entity or its architecture;

e) clarifying the problem space and stakeholder needs; and

f) assessing progress towards meeting architecture objectives.

Architecture evaluations can be performed on any kind of architecture, including a reference architecture, an architecture for a family of systems or an architecture for a product line where there are multiple kinds of architecture entities for a single architecture.

This document provides a generic, conceptual guiding framework that can be used for the planning, execution and documentation of architecture evaluations. Execution is addressed by specification of evaluation elements that can be used during performance of an evaluation effort. Planning and documentation are addressed by specification of work products for the evaluation effort. An organization using this document can establish specific frameworks for the work products and the evaluation elements that can be used as the basis for multiple, recurring architecture evaluation efforts. An organization can also establish tools, methods, best practices, capabilities and resources based on the generic framework provided in this document. The generic framework makes it easier to compare evaluations and evaluation frameworks used in specific cases. Implementation of the proposed architecture framework will in time result in improvement of architecture maturity of the organization.

Software, systems and enterprise — Architecture evaluation framework

1 Scope

This document specifies the means to organize and record architecture evaluations for enterprise, systems and software fields of application.

The aim of this document is to enable architecture evaluations that are used to:

a) validate that architectures address the concerns of stakeholders;

b) assess the quality of architectures with respect to their intended purpose;

c) assess the value of architectures to their stakeholders;

d) determine whether architecture entities address their intended purpose;

e) provide knowledge and information about architecture entities;

f) assess progress towards achieving architecture objectives;

g) clarify understanding of problem space and of stakeholder needs and expectations;

h) identify risks and opportunities associated with architectures; and

i) support decision making where architectures are involved.

NOTE This document addresses the evaluation of an architecture and not an evaluation of the architecture description's suitability. Matters concerning the evaluation of the architecture description fall within the scope of the architecture conceptualization and architecture elaboration processes as defined in ISO/IEC/IEEE 42020. However, it is sometimes the case that the architecture description is evaluated concurrently with the evaluation of the architecture itself.

The entity being evaluated can be of several kinds, as illustrated in the following examples: enterprise, organization, solution, system, subsystem, business, data (as a data element or data structure), application, information technology (as a collection), mission, product, service, software item, hardware item, etc. The kind of entity can also be a product line, family of systems, system of systems, etc. It also spans the variety of applications that utilize digital technology such as mobile, cloud, big data, robotics, Internet of Things (IoT), web, desktop, embedded systems, and so on.

The generic Architecture Evaluation (AE) framework specified in this document can be used in support of the Architecture Evaluation process defined in ISO/IEC/IEEE 42020. Specific frameworks can be derived from this generic framework, which can provide a mapping to the system life cycle processes in ISO/IEC/IEEE 15288 or to the software life cycle processes in ISO/IEC/IEEE 12207.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

— IEEE Standards Dictionary Online: available at: http://ieeexplore.ieee.org/xpls/dictionary.jsp

NOTE Definitions for other terms typically can be found in ISO/IEC/IEEE 24765[1)].

3.1
architecture
fundamental concepts or properties of an entity in its *environment* (3.7) and governing principles for the realization and evolution of this entity and its related life cycle processes

Note 1 to entry: *Architecture entity* (3.3) is the term used in this document when referring to the entity being architected or the entity subject to architecture processes. The fundamental concepts or properties of the architecture entity are usually intended to be embodied in the entity's components, the relationships between components, and the relationships between the entity and its environment.

Note 2 to entry: The concept of architecture used in this document applies broadly to the entity being architected or evaluated. This allows for a more generalized usage when the elements in this document are applied.

Note 3 to entry: The entity to be architected can be of several kinds, as illustrated in the following examples: enterprise, organization, solution, system, subsystem, business, data (as a data element or data structure), application, information technology (as a collection), mission, product, service, software item, hardware item, product line, family of systems, system of systems, etc. It also spans the variety of applications that utilize digital technology such as mobile, cloud, big data, robotics, Internet of Things (IoT), web, desktop, embedded systems, and so on.

Note 4 to entry: Representation of the concepts or properties of an entity and governing principles is captured in architecture models.

Note 5 to entry: Architectures can address a wide range of *concerns* (3.6) expressed, for example, through architecture views and models, as illustrated in the following examples associated with particular kinds of architectures such as: security architecture, functional architecture, physical architecture, resilience architecture, etc.

[SOURCE: ISO/IEC/IEEE 42020:2019, 3.3]

3.2
architecture description
work product used to express an *architecture* (3.1)

Note 1 to entry: This document does not require the existence or use of an architecture description when performing an *architecture evaluation* (3.4). Some *value* (3.10) assessment methods do not demand existence of documented architecture models or views. Examples are customer focus group, expert panels and quality workshops where sufficient knowledge of the architecture is in the people participating in use of these methods. The same is true for architectural analysis in that not all methods applied here necessarily need an explicit description of the architecture.

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.3, modified — The abbreviated term "AD" has been removed; Note 1 to entry has been added.]

1) *System and software engineering — Vocabulary*, available at www.computer.org/sevocab.

3.3
architecture entity
thing being characterized by an *architecture* (3.1)

EXAMPLE The following are kinds of architecture entities that can be dealt with by the architecture processes: enterprise, organization, solution, system (including software systems), subsystem, business, data (as a data element or data structure), application, information technology (as a collection), mission, product, service, software item, hardware item, product line, family of systems, system of systems, collection of systems, collection of applications, etc.

Note 1 to entry: When referring to the architecture itself of these architecture entities, it is common practice to place the name of the kind of entity in front of the word architecture. For example, the phrase system architecture is used when the thing being dealt with during the architecting effort is a system. Likewise, for the other kinds of entities that are being dealt with during the architecting effort.

[SOURCE: ISO/IEC/IEEE 42020:2019, 3.6, modified — The words "considered, described, discussed, studied, or otherwise addressed during the architecting effort" have been replaced with "characterized by an architecture".]

3.4
architecture evaluation
AE
judgment about one or more *architectures* (3.1) with respect to the specified evaluation objectives

EXAMPLE 1 Various kinds of judgments could be made during an architecture evaluation, such as validating that architectures address the *concerns* (3.6) of *stakeholders* (3.9), assessing the quality of architectures with respect to their intended purpose, assessing the *value* (3.10) of architectures or architecture entities to their stakeholders, determining whether architecture entities address their intended purpose, providing knowledge and information about architecture entities and identifying risks and opportunities associated with architectures.

EXAMPLE 2 Examples of architecture evaluations are provided in Annex C.

Note 1 to entry: A decision regarding disposition of the architecture is usually outside the scope of an AE effort, although it could be done in conjunction with the AE effort. The AE results are often reported to a decision maker who makes the actual determination of disposition based on those results and sometimes also on other *factors* (3.8) not considered by the AE effort. Sometimes this determination is called an "evaluation" but for the purpose of this document, the evaluation is limited to just the judgment with respect to relevant evaluation objectives.

3.5
architecture evaluation framework
conventions, principles and practices for evaluating *architectures* (3.1) in a consistent and repeatable manner

EXAMPLE Examples of AE frameworks are provided in Annex D for the following cases: Architecture Tradeoff Analysis Method (ATAM), the Method Framework and QUASAR method and Analysis of Alternatives (AoA).

Note 1 to entry: This framework can be generic in nature or specific to a domain of application, a collection of *concerns* (3.6) to be examined or a methodology. This document defines a generic AE framework and a specific AE framework can be derived from the generic framework.

Note 2 to entry: An AE framework can enable AE efforts to be performed in a more consistent and repeatable manner.

Note 3 to entry: The evaluation framework can consist of different sub-architecture frameworks for an entity with many layers or levels. These could be defined and consolidated as part of the comprehensive architecture framework package.

3.6
concern
matter of interest or importance to a *stakeholder* (3.9)

EXAMPLE Affordability, agility, availability, dependability, flexibility, maintainability, reliability, resilience, usability and viability are examples of concerns. Survivability, depletion, degradation, loss, obsolescence are examples of concerns. The PESTEL mnemonic is a reminder of other possible areas of concern: political, economic, social, technological, environmental, and legal. A longer list of examples is provided in 4.2.

Note 1 to entry: The concept of concern is similar to "quality attributes" as used in the ATAM. See Annex D for an overview of the ATAM approach. In ATAM, quality attributes are typically decomposed into concerns.

Note 2 to entry: The concept of concern is similar to the concept of quality. See A.4 for an overview of the quality concept.

[SOURCE: ISO/IEC/IEEE 42020:2019, 3.8, modified — In EXAMPLE, reference to 4.2 has been added; Notes 1 and 2 to entry have been added.]

3.7
environment
context determining the setting and circumstances of influences upon an *architecture entity* (3.3) or upon which the architecture entity can have an influence

Note 1 to entry: There can be things beyond the environment that have an indirect impact on the architecture entity. It could be important to account for these indirect effects by incorporating these causative agents in the environment even though they are not usually considered to be within the immediate context. *Value* (3.10) chain analysis is an example of where this is done.

3.8
factor
circumstance, fact or influence that contributes to a result or outcome

Note 1 to entry: A factor is something that contributes causally to a result. Factors identification can sometimes be driven by knowledge of desired effects.

3.9
stakeholder
role, position, individual or organization having a right, share, claim or other interest in an *architecture entity* (3.3) or its *architecture* (3.1) that reflects their needs and expectations

[SOURCE: ISO/IEC/IEEE 42020:2019, 3.20]

3.10
value
regard that something is held to deserve; the importance, worth, or usefulness of something to somebody

Note 1 to entry: *Architecture evaluation* (3.4) is focused primarily on the value of an *architecture* (3.1) with respect to *stakeholder* (3.9) *concerns* (3.6) or architecture objectives for that thing. However, sometimes the purpose of the evaluation effort is, by inference, to determine the impact of the architecture on the value of the *architecture entity* (3.3) when the entity is developed or evolved to align with the architecture concepts and properties.

Note 2 to entry: The determination of architecture value can take various aspects into account, such as worth, significance, importance, usefulness, benefit, and quality. These words have similar but not identical meaning. Worth is usually what one is willing to pay for something. Significance is about being worthy of attention. Importance is about the state or fact of being of great significance or value. Usefulness is about serving some purpose, or about being advantageous, helpful or of good effect. Benefit is about an advantage or profit gained from something. Quality is about the degree of excellence of something. Throughout this document, the term value is used to mean one or more of these other concepts, as appropriate.

Note 3 to entry: Even though a new architecture could be found to be of greater value with respect to the current situation, this needs to be balanced against the costs and risks of adopting the new architecture. So, it is not necessarily the case that when examining architecture alternatives, the one with the maximum value is proposed as the preferred choice since the extra cost or risk of this architecture might not be worth the extra burden. This is sometimes referred to as the benefit-cost ratio or some other term with similar meaning.

Note 4 to entry: Value is determined primarily in the Value Assessment Tier of the evaluation framework illustrated in Figure 1. Requirements on value assessment are specified in 6.2.

4 Conceptual foundation

4.1 General

This clause introduces key concepts used in this document with respect to architecture evaluation. The terms and the concepts presented in this clause are used in Clauses 6 through 8 to express requirements. The conceptual model of architecture evaluation is presented in parts throughout this clause.

The generic AE framework work products and elements, illustrated in Figure 1 and specified in this document, can be used in support of the Architecture Evaluation process defined in ISO/IEC/IEEE 42020. Specific frameworks can be derived from this generic framework.

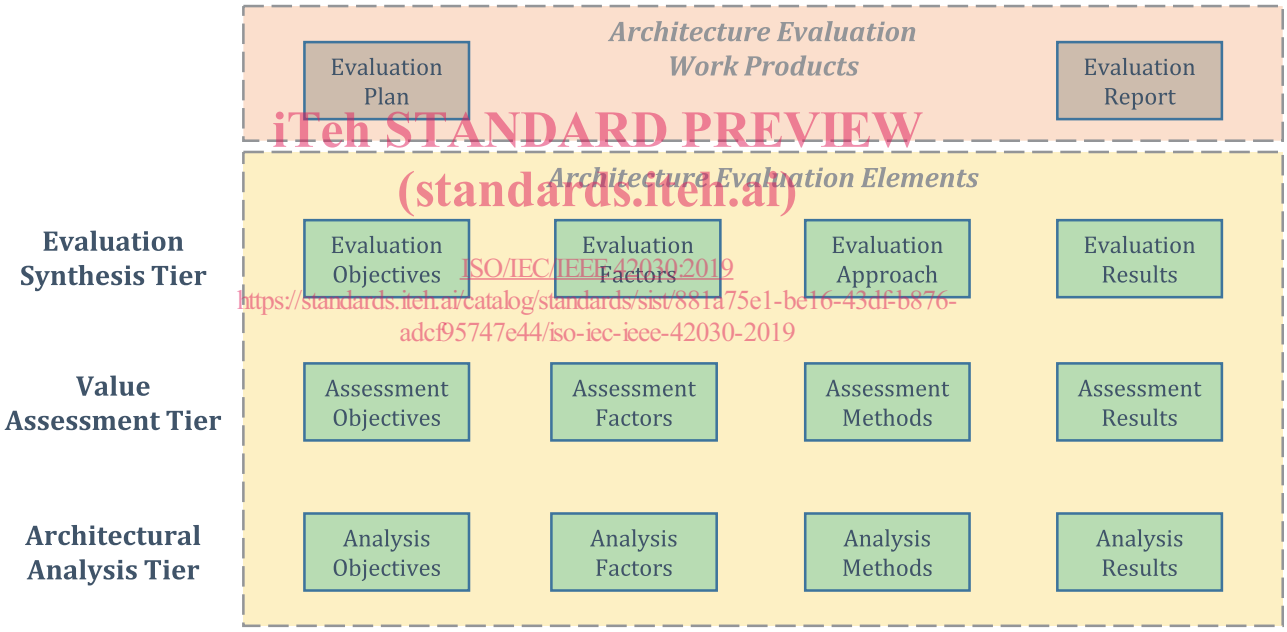

Figure 1 — Generic architecture evaluation framework

These specific frameworks may range from those targeting industry segments, such as automotive or refinery operations, to those targeting common business processes, such as portfolio management and program planning, and to those targeting common business architectures, such as banking, retail, insurance, telecom, travel and hospitality, etc. Specific frameworks allow the user to capture and reuse concepts common to many enterprises and thereby increase the efficiency with which architectures can be evaluated.

Architecture evaluation makes a judgment with respect to how well architecture objectives have been or will be achieved. It can provide answers to an identified set of questions to, for example, provide inputs to strategic decision making (such as whether it would be cheaper in the long run to modify an existing architecture to close value gaps), or to produce a new architecture that better addresses current and future stakeholder needs. An architecture evaluation can also provide inputs to decisions made at the operational and tactical levels. For example, the evaluation may provide useful information regarding capability limitations of the entity in question.

The subclauses below describe the elements used in each tier of the generic framework and describe the different kinds of specific frameworks that utilize these elements.

4.2 Architecture evaluation context

Figure 2 depicts the context of architecture evaluation in terms of key concepts and the relations between them.

NOTE 1 The graphical notation used in this document is a simplified version of entity-relationship modeling.

NOTE 2 Only the key associations are shown in the diagrams.

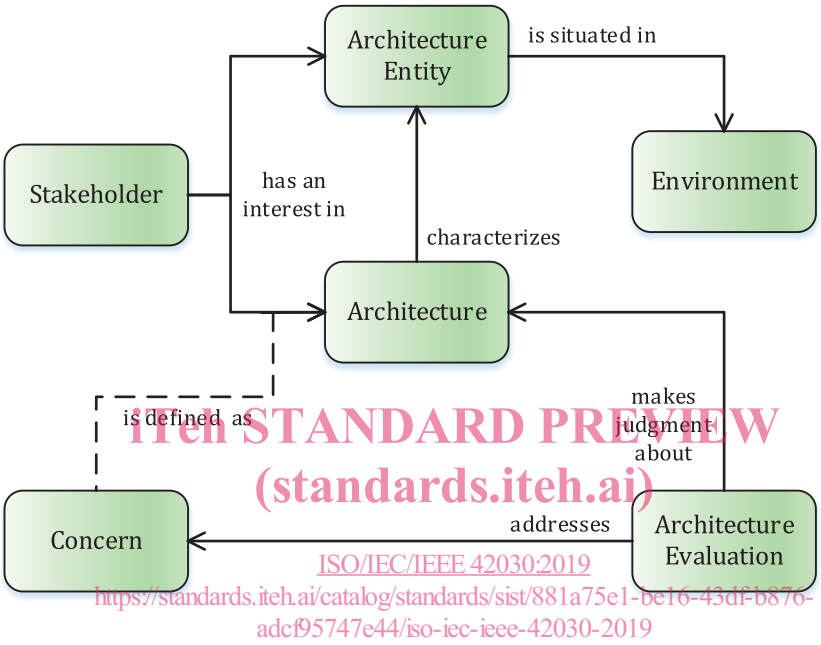

Figure 2 — Context of architecture evaluation

The AE effort can be performed at many stages of entity development, including during conceptual design through to during the operation and maintenance. The evaluation may need to be updated to reflect changes as the entity design progresses through its lifecycle.

An AE effort is often performed to determine the potential or actual value of the associated architecture entity. However, the primary focus of the AE effort is on the value of the architecture itself even though the ultimate aim could be a determination of the value of the architecture entity, or the impact on the environment, or the impact on the business that uses the architecture entity, etc. But the value of the architecture entity or other benefits might be determined by some other effort, such as system analysis, requirements analysis, business needs analysis, portfolio management, program assessment and evaluation, environmental impact assessment, etc.

Architecture evaluation makes a judgment regarding the extent to which architecture objectives have been or will be achieved. Because of this, it is dealing with the degree to which the architecture provides things such as needs satisfaction, feasibility, understandability, usability desired qualities.

The environment within which the architecture entity is situated could provide strategic context for determining the ways in which the architecture evaluation is conducted. The environment could also be a key factor in understanding the nature of stakeholder concerns. States and modes of operation of the architecture entity are often from the usage perspective of entities in the environment.

Stakeholders have interests in the architecture or associated architecture entities. These interests (called concerns) are usually the primary focus of architecture evaluation. This judgment provided by the AE effort represents the extent to which stakeholder concerns have been or will be satisfied by decisions that affect the associated architecture entities or their environments. This judgment can also

represent the extent to which the architecture fulfills its intended purpose. Ways to measure this will be identified or specified during the AE effort along with the means by which these measures will be ascertained.

NOTE 3 Determination of the extent to which concerns are satisfied could entail either measurement of the degree to which something is done or a determination of whether something is true or not. Pass/fail criteria could need to be established prior to performing the evaluation. These criteria could be defined in the AE plan or could be established by the organization as a matter of policy or directive.

EXAMPLE 1 Stakeholders include people and organizations such as: users, operators, acquirers, owners, suppliers, developers, builders and maintainers. It also includes authorities engaged in certifying the architecture entity for a variety of purposes such as its readiness for use, conformance to legal provisions and compliance with regulations and policies with respect to safety, security, privacy, environmental impact, etc., as well as evaluators such as funding agencies, integration authorities, governance boards, management boards, client representatives and regulatory authorities. Stakeholders can go beyond individuals and organizations to also include things like governmental bodies, supply chains, value chains, institutions, and social groups.

EXAMPLE 2 Concerns include such things as: affordability, agility, alignment with business goals and strategies, autonomy, availability, behavior, business impact, capability, complexity, compliance to regulation, concurrency, control, cost, customer experience, data accessibility, deadlock, disposability, environment impact, error and exception handling, extensibility, evolvability, feasibility, flexibility, functionality, graceful degradation, information assurance, interoperability, inter-process communication, known limitations, maintainability, misuse, mission impact, modifiability, modularity, openness, performance, portability, privacy, quality of service, recoverability, reliability, resilience, resource utilization, schedule, security, shortcomings, state transitions through lifecycle, scalability, software and systems assurance (ISO/IEC 15026-1), structure, subsystem integration, architecture entity features, architecture entity properties, architecture entity purposes, usability, usage, viability, etc.

EXAMPLE 3 The PESTEL mnemonic is a reminder of other possible areas of concern: political, economic, social, technological, environmental, and legal. Survivability, depletion, degradation, loss and obsolescence are other examples of areas of concern. Other mnemonics that could be useful include STEEPLED that adds ethics and demographic factors, SPELIT that adds intercultural factors, STEER that adds regulatory factors and STEP that adds ecological factors.

EXAMPLE 4 Examples of value include such things as: physiological well-being, safety from harm, feelings, aesthetics, price, savings, sense of belonging, self-esteem and self-actualization.

Architecture principles, although not shown in the diagram, will shape the architecture and can perform a key role in the architecture evaluation. An understanding of these principles can help guide proper evaluation of an architecture. These principles will influence selection of AE factors used throughout the evaluation effort and help in the identification of relevant concerns. Architectural features and functions need to be consistent with the architecture principles. See Reference [17] and [18].

4.3 Architecture evaluation tiers

4.3.1 Evaluation synthesis

Synthesis involves the combination of results from multiple value assessments to determine to what extent the evaluation objectives will be achieved. Stakeholders who have concerns about the subject of the evaluation could have specific goals that should be addressed in the evaluation. (These concerns could be about the architecture, the architecture entity or both.) These goals should be considered when establishing the factors and objectives to be used in the evaluation. These goals might not correspond to the original goals for the architecture when it was initially conceived.

NOTE 1 The experts involved in the evaluation are also stakeholders and can bring important evaluation objectives that are not a known concern for traditional stakeholders (such as acquirer, user, service provider), but are concerns that the profession defines to be important (and where the evaluators could be the best placed stakeholders to represent the profession).

Architecture trade-offs are identified and characterized during architecture development. However, they can be revisited during the evaluation synthesis. Trade-offs among stakeholder concerns and feasibility limitations will be identified. Typical trade-offs to consider are the following: cost vs

performance, cost vs schedule, weight vs speed, accuracy vs timeliness, acquisition cost vs operating cost, ease of use vs security, flexibility vs predictability, agility vs robustness, risk vs reward, etc. Trade-offs could be with respect to the various factors within a single architecture or across alternative architectures under examination.

An AE effort examines one or more architectures with respect to potential stakeholder concerns about the associated architecture entities. Figure 3 depicts AE elements that can be used in an evaluation synthesis effort in terms of the key concepts and the relations between them. Most of these concepts are also used in related standards described in Annex B.

NOTE 2 Value is determined primarily in the Value Assessment Tier of the evaluation framework illustrated in Figure 1. Requirements on value assessment are specified in 6.2.

The evaluation synthesis effort is the result of applying the concepts in the document during the evaluation of one or more architectures to determine their value to stakeholders or the extent to which the architecture objectives are satisfied.

NOTE 3 The evaluation synthesis effort is usually a non-trivial exercise that requires a pre-defined mapping of attributes and issues (gaps in desired outcomes) across the lineage of interactions between stakeholders and assets (and the services they rely upon to get their jobs done) and with respect to dependencies on the designs, development efforts and operations (used to deliver those assets and services), and finally with respect to the architectural artifacts relied upon by the designers, developers, users and operators.

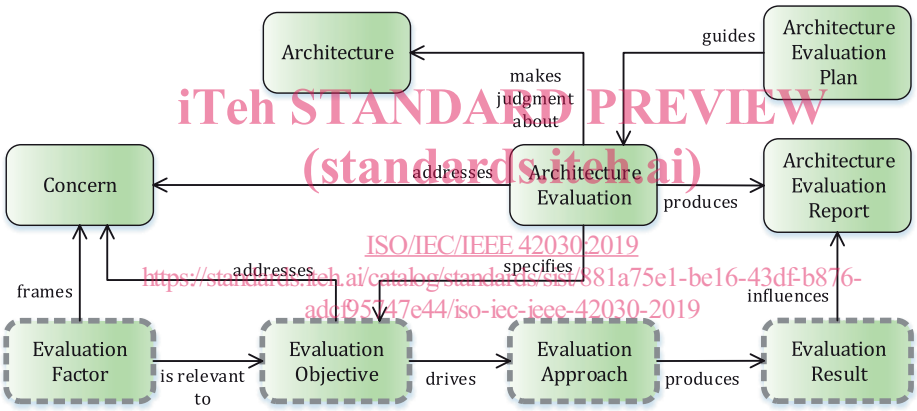

Figure 3 — Key concepts with respect to evaluation synthesis effort

AE objectives are derived from one or more of the relevant concerns. One or more AE approaches are used to address the AE objectives. AE objectives assigned to an AE approach help to determine what concerns are relevant to that approach and what approaches are relevant to each concern. More than one approach could be used within a single evaluation effort to improve the ability to address different aspects of the architecture leading to more accurate, cost-effective and timely evaluations.

EXAMPLE 1 Examples of AE approaches are: review panel, prototype demonstration, system experiment, modeling and simulation, model walkthrough, technical analysis, compliance audit, concept review and user symposium.

EXAMPLE 2 Examples of AE objectives are:

— Will the business solution meet primary business needs?

— Is the system affordable?

— Will the service be dependable?

— Will the product have sufficient market penetration?

— What is the return on investment?

NOTE 4 The AE approach does not necessarily have to be highly structured or formal in nature, which is why this is not called a "method." A method, on the other hand, is a particular form of procedure for accomplishing something, especially a systematic or established one.

NOTE 5 Evaluation of artifacts used to guide the design, development and delivery of assets and/or services can provide useful insights when assessing the value of architecture(s).

Evaluation factors are established based on relevant stakeholder concerns. The evaluation factors will contribute to addressing one or more of the evaluation objectives. The evaluation approach determines how necessary information will be gathered and processed, and how evaluation criteria will be applied on the processed information to generate evaluation results for use in the AE report.

The evaluation approach will use value assessment results as one of the criteria for making judgment(s) about the architecture. Other criteria for making these judgments could include such things as technical feasibility, operational suitability, backward/forward compatibility, technology maturity, budget constraints, time limits, window of opportunity, intellectual property advantages, etc.

NOTE 6 Evaluation factors could be derived from the desired outcomes that stakeholders are trying to obtain from the services and assets they rely upon.

EXAMPLE 3 Examples of AE factors are cost, schedule, performance and risk.

The AE plan guides management and execution of the AE effort by specifying, among other things, the evaluation objectives. It documents the purpose and scope of the evaluation and the circumstances under which the AE effort will be conducted. It documents the expected schedule and resources to deliver the evaluation results. The AE plan describes the evaluation approaches that will be driven by the evaluation objectives. The AE plan, if appropriate, can also specify the methods to be used for value assessment and architectural analysis.

The AE plan identifies necessary information sources, such as:

— those that are useful for creating an understanding of the architecture as a basis for generating evaluation results and drawing valid conclusions;

— those that are useful for creating an understanding of architecture entities as a basis for making relevant judgments about the architecture; and

— non-architecture-related sources, such as business plans, cost data, project schedules, software code and operating manuals.

NOTE 7 The activities in the Architecture Evaluation process specified in ISO/IEC/IEEE 42020 can be used as a guide when planning an AE effort. The planning activity specified in that AE process provides recommended tasks for planning an AE effort.

The overall conclusions of the AE effort are provided in AE reports along with any supporting data and information.

NOTE 8 More than one report could be needed to address different audiences or possibly be provided as interim reports along the way. For example, the sponsor could receive a highly detailed report while the decision maker could receive a high-level summary with only the factors most relevant to the decision at hand. There could be a sensitive or classified version of the report for people with the appropriate clearances and another version that only contains unclassified or less sensitive information.

4.3.2 Value assessment

Value assessment is a determination regarding the amount and kind of value a stakeholder can expect from the architecture. Value can be defined as either a qualitative description or a quantitative extent of this expectation from the use, possession or operation of the architecture entity.

EXAMPLE 1 In some cases, the mere possession of an architecture entity can provide value to a stakeholder. For example, holding gold in the vault can provide security to the owner. A nation possessing a strong defensive capability can provide security to the citizens, hoping they never have to use such a capability.