

# IEEE Standard 1471-2000

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# Core Concepts and Relationships in IEEE 1471

- Every system has an architecture, but an architecture is not a system.
- An architecture and an architecture description are not the same thing.
- Architecture standards, descriptions, and development processes can differ and be developed separately.
- Architecture descriptions are inherently multiviewed.
- Separating the concept of an object's view from its specification is an effective way to write architecture description standards.

# Some Notes

- Civil architecture as a metaphor for the design of software-intensive systems.
- The architect is the client's trusted agent in coordinating all aspects of a building project, including the integration of structural, business, legal, and aesthetic concerns.
- While the architect's role is broad, it does not extend to all of the building project's details.
- The architect's domain is the essential core, the aspects of the project that define usage, value, cost, and risk to within the client's tolerances.

# Definition of Architecture

***“The fundamental organization of a system embodied in its components, their relationships to each other and to the environment, and the principles guiding its design and evolution.”***

- This definition incorporates the idea that there is a difference between an architectural description and an architecture.
  - An architectural description is a concrete artifact.
  - An architecture is a concept of a system.
- An architecture embodies a system’s fundamental aspects.

# Normative Requirements

- on architectural descriptions—the documents that describe a system's architecture.
- IEEE 1471 does not standardize a system's architecture or the process for developing it.
  - more like a blueprint standard than a building code
- IEEE 1471 defines the equivalent of drawing and symbology conventions.
  - It does not define the full range of drawings needed to provide a description of any particular system.

# Key Element

1. a set of definitions for key terms such as architectural description, architectural view, and architectural viewpoint;
2. a separation of the concepts of architecture and architecture description to facilitate establishing standards for describing architectures (analogous to blueprint standards) and standards for constructing systems (analogous to building codes or zoning laws); and
3. content requirements for describing a system's architecture.

**Note:** Because the architecture description concept has expanded to include budgets, business cases, and protocol definitions as well as physical component structure, it is evident that a single language is insufficient.

# Views

- A view is a collection of models that represent one aspect of an entire system.
- A view applies to only one system, not to generalizations across many systems.
- The standard introduces the concept of viewpoints to capture common descriptive frameworks across many systems.
- Viewpoints are the vehicles for writing reusable, domain-specific architecture description standards.
- They establish the languages or notations used to create a view, the conventions for interpreting it, and any associated analytic techniques that might be used with the view.
  - An architecture description must define the viewpoint for each view it contains.

# Architecture Description Requirements

- Content requirements for architectural description in terms of its elements.
- System's stakeholders and their architectural concerns:
  - Functionality. What does the system need to do?
  - Performance. How will the system behave under heavy loads?
  - Security. Can the system adequately protect user information?
  - Feasibility. Can we implement the system?
- to be organized into one or more views of the system's architecture:
  - A view must address identified stakeholders' concerns.
  - It must be well formed.
  - At least one view must address each identified architectural concern.
- must provide the rationale for making key architectural decisions
  - trade-offs the architects considered
  - alternatives they didn't choose
  - other analyses that led to the choice