



What is IT Systems Architecture ?

Introduction and Overview

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Architecture is a term that lots of people try to define

There is not just one way to state a system's architecture

Common elements of most attempts to define architecture, in the context of IT and other systems:

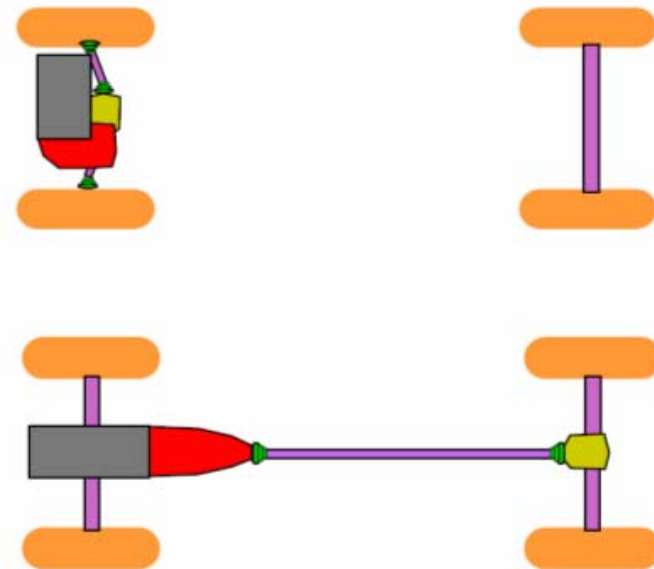
- Breakdown of a system into its parts
- The relationship between the parts (static and dynamic)
- Decisions about the design of a system that are hard to change

Architectures can be implied, apparent, or explicitly planned

- **Implied architecture**
 - of abstract things such as music or mathematics
- **Apparent architecture**
 - of natural things, such as geological formations or the structure of biological cells
- **Explicitly planned architecture**
 - of human-made things such as software, computers, enterprises, and databases, in addition to buildings.
- **Etymology:**
 - Latin: architectus
 - Greek: arkhitekton (αρχιτεκτων) = master builder
 - From arkhi (αρχι) = chief + tekton (τεκτων) = builder, carpenter
 - archon: one of the nine chief magistrates of ancient Athens, 1659, from Gk. arkhon "ruler"

In every usage, an architecture, whether implied, apparent or explicitly planned, may be seen as:

- A *subjective* mapping from **one of many possible** human perspectives
 - to the elements or components of some kind of structure or system,
 - which preserves the relationships among the elements or components.

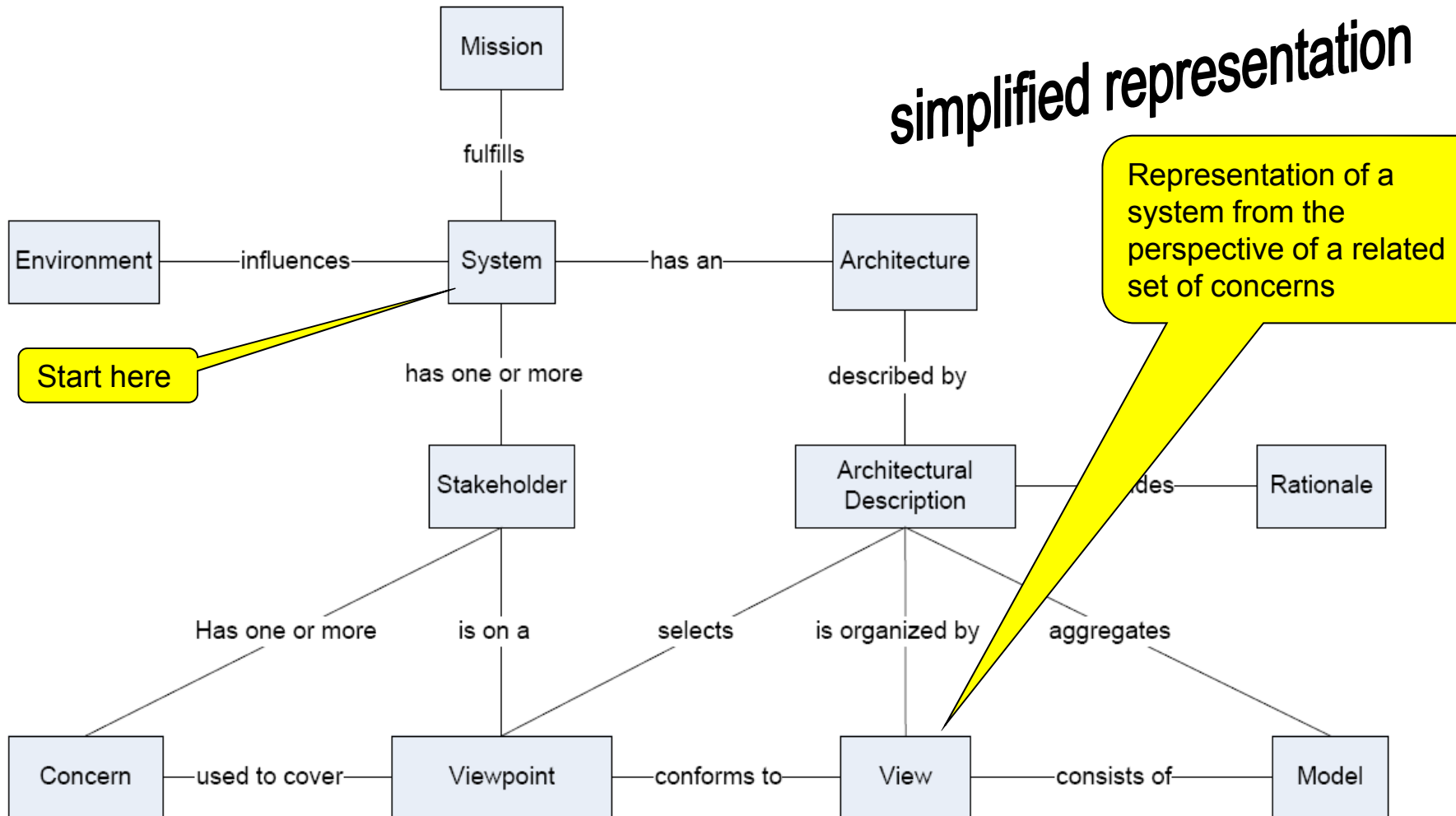


IT Architecture: Definitions and Characteristics

- ANSI/IEEE Std 1471-2000: IEEE Recommended Practice for Architectural Description of Software-Intensive Systems
 - The fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution
- Rechtin, The Art of Systems Architecting
 - The structure (in terms of components, connections, and constraints) of a product, process, or element.
 - Architecture is what architects produce: The set of information that defines a system's **value**, **cost**, and **risk** for the purposes of the systems sponsor.
- Must address
 - **Function** and **quality**, including **aesthetics** for the user (client / customer)
 - **Feasibility** and **cost** for the builder

Conceptual Framework of the IEEE Standard P1471

Recommended Practice for Architectural Description of Software-Intensive Systems



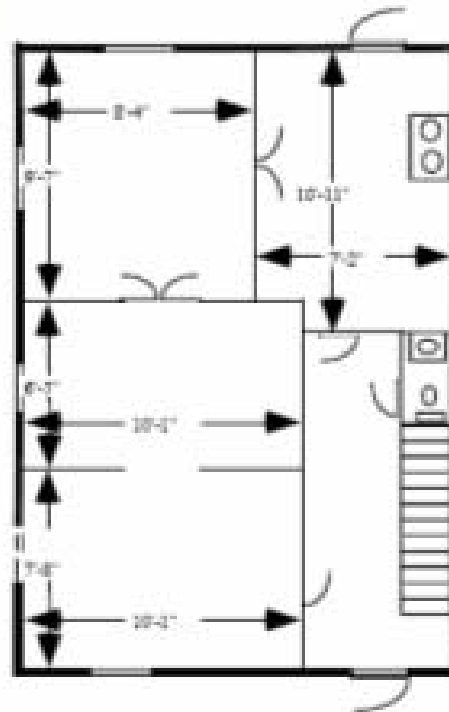
Architectural Description

- A collection of **Workproducts** to document an architecture
- Addressed to one or more **Stakeholders** to answer their **Concerns** about the system
- Organized into one or more **Views** of the system
- Each **View** addresses one or more **Concerns** of the **Stakeholders**
- A **View** is a way of looking at an architecture
- A **View** is what you see when you look at the architecture from a particular **Viewpoint**

Architectural Views

- **Enable the architecture to be communicated to, and understood by, all the stakeholders**
- **Enable stakeholders to verify that the system will address their concerns**
- **Examples**
 - **Scope description:** Planner's view
 - **Model of the business:** Owner's view
 - **Information system model:** Designer's view
 - **Technology model:** Builder's view
 - **Detailed blueprints:** Subcontractor's view

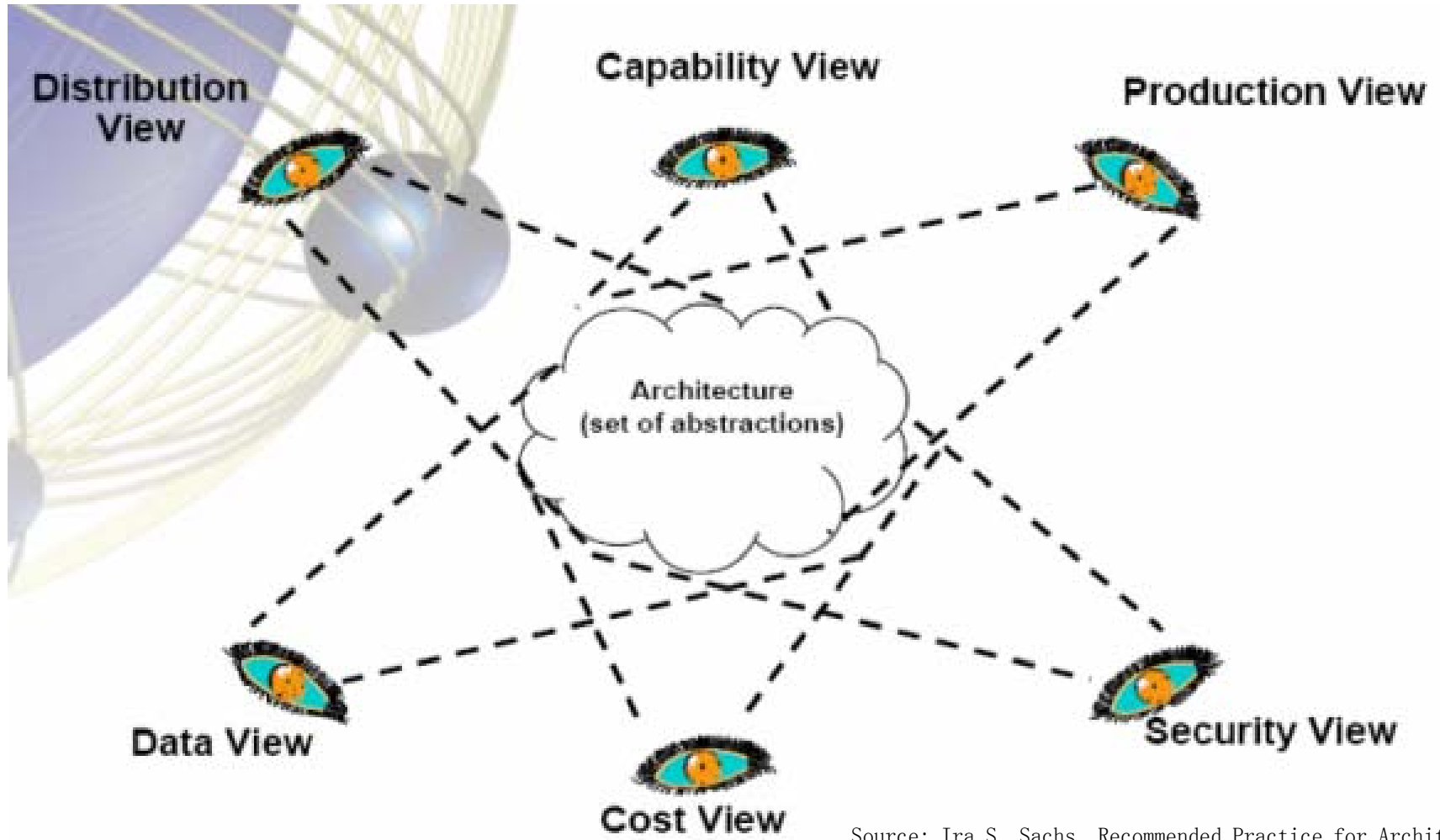
Multiple views and models



- Bill of Materials
- 2x4x8 250
- 2x6x8 150
- 4x4x10 10
- Siding 1500 sq ft
- Shingles 500 sq ft
- 8d nails 20 lb
- 6d nails 10 lb

Source: Ira S. Sachs, Recommended Practice for Architectural Description, IEEE Standard P1471

Sample Views



Source: Ira S. Sachs, Recommended Practice for Architectural Description, IEEE Standard P1471

The 4+1 view model of software architecture

