

# Systems Architecture Fundamentals - Conceptual, Logical, Physical Designs

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A Systems Architect responsibilities includes the ability to create, review, and update (don't forget this last one!) designs or blueprints to provide an overall direction for the system, project, department, or enterprise. See [What is a Systems Architect?](#) for more about the position.

These fundamentals of system design can go through various stages from the initial project concept to the final plan prior to implementation. Not only is it important to develop a design (or roadmap) at each stage but it can also be a useful tool for training and marketing of the concept. The age old saying "a picture is worth a thousand words" still holds true. Each stage builds upon the previous stage in detail allowing the individual to more completely understand the big picture and then focus on the details as it progresses.

There is often confusion between each of these different types of designs. With each one of these types of designs, you may need to develop more than one of each depending on the target audience. For example, there may be a business view conceptual design which may actually seem quite simple and only contains 5 boxes and a few lines and words. There may also be a single architectural conceptual design or even multiple architectural designs (activity, state, and collaboration conceptual design diagrams). Your project and target audience will determine the need.

## Conceptual Design

A conceptual design is an abstract or high level design which includes only the most important components and entities. The main goal of a conceptual design is to provide an understandable picture of the overall purpose of the proposed solution. Components may include major technology systems, external systems that are required for integration or overall functionality, high level data flow, and system functionality. Think of this as the "black box" diagram where portions of the diagram may be simply a technology component to-be-named-later but is identified with its role and purpose.

## Logical Design

A logical design is a more detailed design which includes all major components and entities plus their relationships. The data flows and connections are detailed in this stage. The target audience is typically developers or other systems architects. However, it is possible to create logical designs for business purposes to ensure that all components and functionality is accounted and well understood. Logical designs do not include physical server names or addresses. They do include any business services, application names and details, and other relevant information for development purposes.

### **Physical Design**

A physical design has all major components and entities identified within specific physical servers and locations or specific software services, objects, or solutions. Include all known details such as operating systems, version numbers, and even patches that are relevant. Any physical constraints or limitations should also be identified within the server components, data flows, or connections. This design usually precludes or may be included and extended by the final implementation team into an implementation design.

The UML (Unified Modeling Language) is also another method that can be explored for design and definition for these and other designs. There are several diagram types within the UML which could be developed at each one of these design stages. I'd be interested to hear about your interest or experiences with development of these designs or others similar to it. Also, some believe there should be various focus areas such as the [Microsoft Architecture](#) format with business, application, technology, and information views of each of these stages. This will depend on the maturity of your company's architecture program and also the project scope and target audience for your designs.