Building the Requirements Model

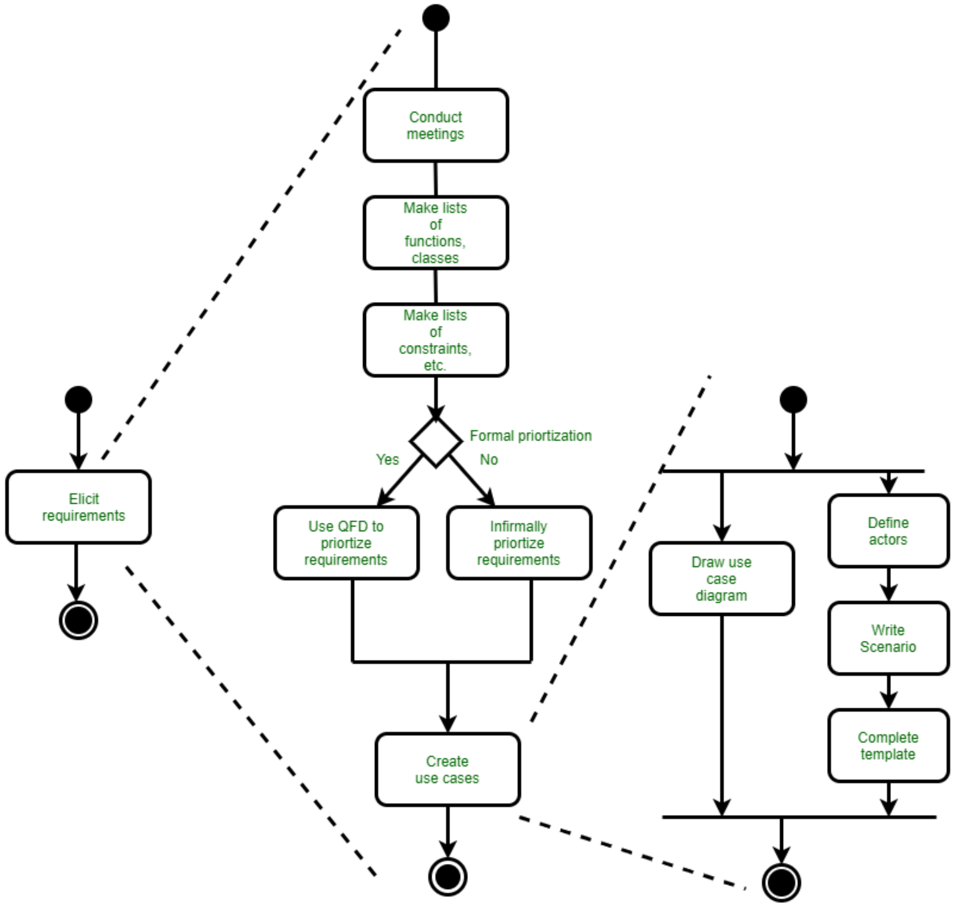
The intent of the analysis model is to provide a description of the required informational, functional, and behavioral domains for a computer-based system. The model changes dynamically as you learn more about the system to be built, and other stakeholders understand more about what they really require. For that reason, the analysis model is a snapshot of requirements at any given time.

Elements of the Requirements Model:

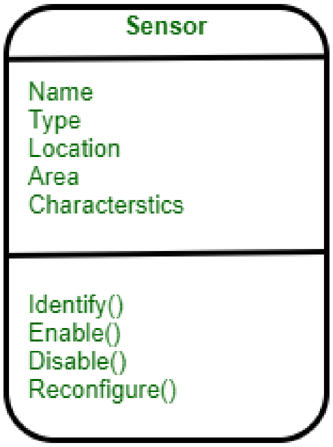
There are many different ways to look at the requirements for a computer-based system. Different modes of representation force you to consider requirements from different viewpoints—an approach that has a higher probability of uncovering omissions, inconsistencies, and ambiguity.

Scenario-based elements.

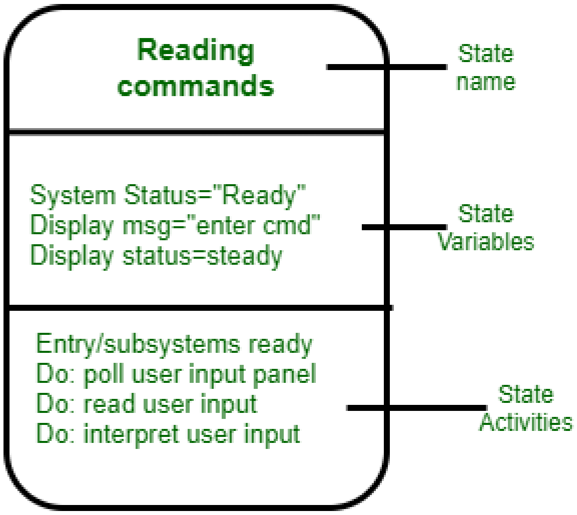
The system is described from the user's point of view using a scenario-based approach. For example, basic use cases and their corresponding use-case diagrams evolve into more elaborate template-based use cases. Scenario-based elements of the requirements model are often the first part of the model that is developed. Three levels of elaboration are shown, culminating in a scenario-based representation.



Class-based elements. Each usage scenario implies a set of objects that are manipulated as an actor interacts with the system. These objects are categorized into classes—a collection of things that have similar attributes and common behaviors.



Behavioral elements. The behavior of a computer-based system can have a profound effect on the design that is chosen and the implementation approach that is applied. Therefore, the requirements model must provide modeling elements that depict behavior. The state diagram is one method for representing the behavior of a system by depicting its states and the events that cause the system to change state. A state is any externally observable mode of behavior. In addition, the state diagram indicates actions taken as a consequence of a particular event.



Flow-oriented elements. Information is transformed as it flows through a computer-based system. The system accepts input in a variety of forms, applies functions to transform it, and produces output in a variety of forms. Input may be a control signal transmitted by a transducer, a series of numbers typed by a human operator, a packet of information transmitted on a network link, or a voluminous data file retrieved from secondary storage. The transform(s) may comprise a single logical comparison, a complex numerical algorithm, or a rule-inference approach of an expert system.

Analysis Patterns:

Anyone who has done requirements engineering on more than a few software projects begins to notice that certain problems reoccur across all projects within a specific application domain. These analysis patterns suggest solutions (e.g., a class, a function, a behavior) within the application domain that can be reused when modeling many applications. Analysis patterns are integrated into the analysis model by reference to the pattern name. They are also stored in a repository so that requirements engineers can use search facilities to find and apply them. Information about an analysis pattern (and other types of patterns) is presented in a standard template.