CHAPTER 5

SYSTEM DESIGN

System design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system.

Systems design implies a systematic approach to the design of a system. It may take a bottom-up or top-down approach, but either way the process is systematic wherein it takes into account all related variables of the system that needs to be created—from the architecture, to the required hardware and software, right down to the data and how it travels and transforms throughout its travel through the system. Systems design then overlaps with systems analysis, systems engineering and systems architecture.

The systems design approach first appeared right before World War II, when engineers were trying to solve complex control and communications problems. They needed to be able to standardize their work into a formal discipline with proper methods, especially for new fields like information theory, operations research and computer science in general.

5.1 Data Flow Diagram

The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of the input data to the system, various processing carried out on these data, and the output data is generated by the system.

Figure 5.1 gives the DFD for the proposed system. It shows how data moves though the entire system. From the DFD it is evident that input signal is generated by the client or user. The generated signal is then sent for sampling by the respective module. The samples generated are stored in an external file along with the necessary parameters needed for reconstruction. This file is then sent for recovery of the original signal by the reconstruction module.

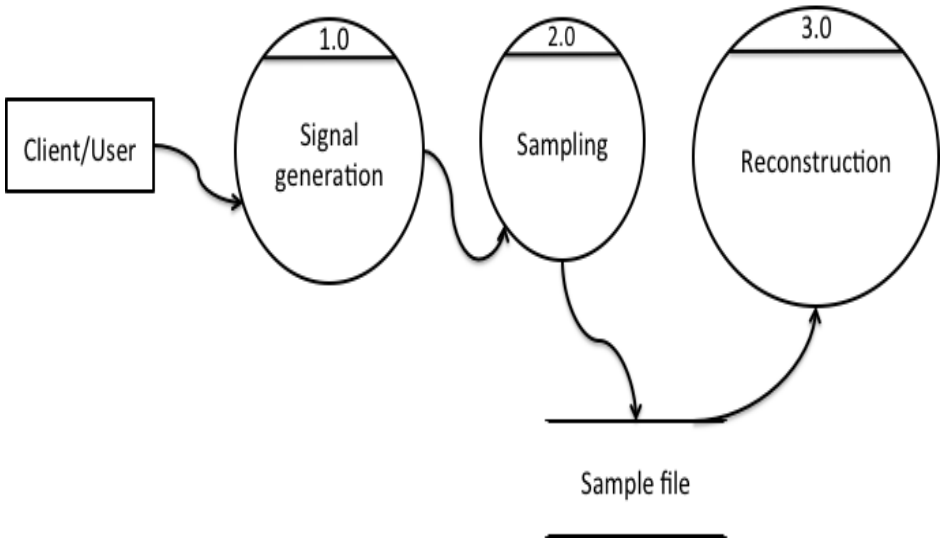

Figure 5.1 Data Flow Diagram

5.2 Use Case diagram

A **use case diagram** at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

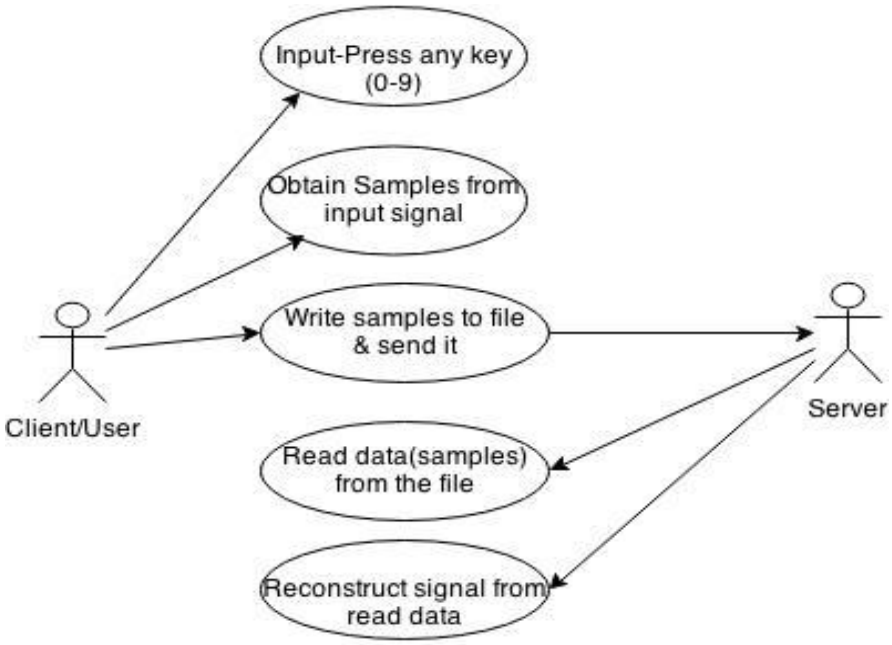

Figure 5.2 Use case diagram

Figure 5.2 gives the UML use case diagram for the given system. It shows the various actions being performed by Client and server. Client module is used basically for inputting the data and then sampling the signal whereas server module is responsible for the recovery of samples and then the actual reconstruction of the original signal.

5.3 Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams are intended to model both computational and organizational processes (i.e. workflows).Activity diagrams show the overall flow of control. Figure 5.3 gives the activity diagram for the system. It shows the flow of actions in the entire process along with the necessary decisions to be taken.

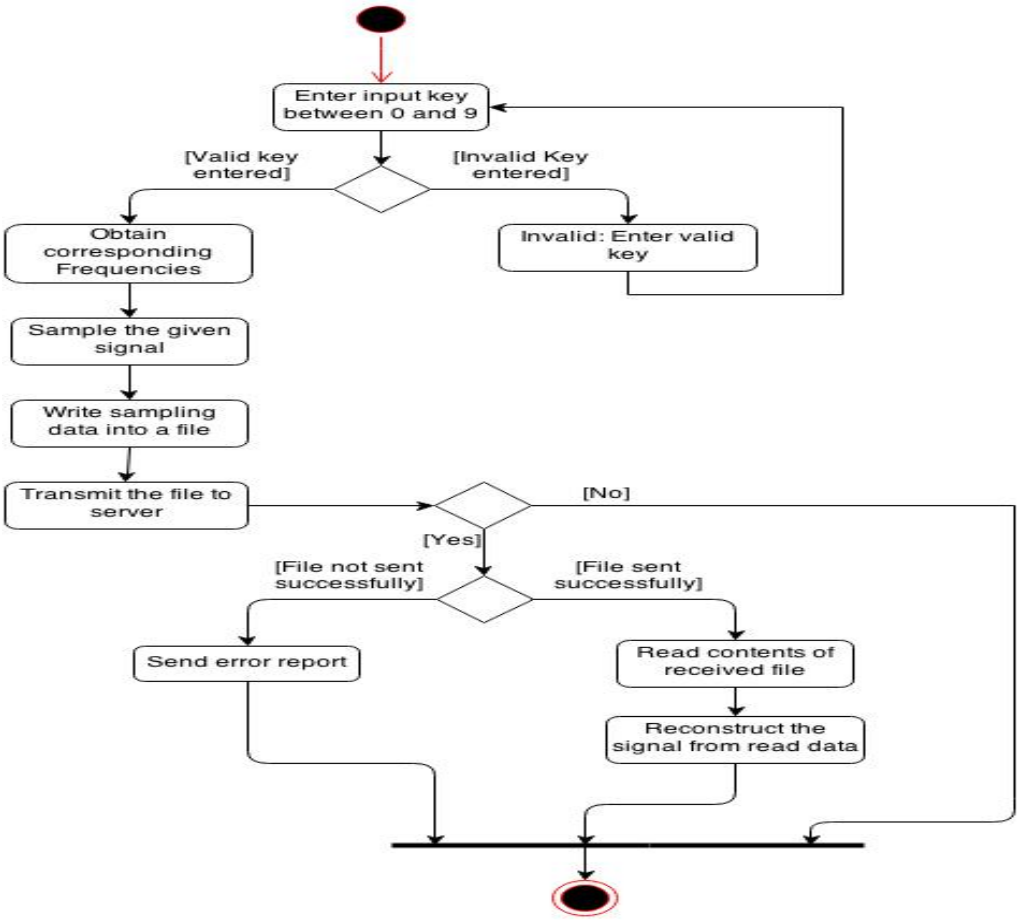

Figure 5.3 Activity Diagram