CHAPTER – 3

SYSTEM DESIGN

3.1 Introduction

The purpose of this system design chapter is to add the necessary detail to the current project description to represent a suitable model for coding. The system design documentation presents the structure of the system such as the Architecture and Data Flow Diagram.

3.2 Development Strategy

The system is designed using 'The Waterfall model'. The waterfall model was the first structured approach to systems development. The waterfall model is just a time ordered list of activities to be performed to obtain an IT system.

The activities in waterfall model are:

1. System Analysis
2. System Design
3. Coding
4. Testing
5. Implementation
6. Maintenance

3.3 System Architecture

System architecture is a conceptual model that defines the structure, behavior and more views of the system.

An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structure of the system which comprises system components, the externally visible properties of those components, the relationship between them, and provides a plan from which products can be produced, and systems can be developed, that will work together to implement the overall system.

The system is divided into 3 modules:

- Hardware module
- Processing module
- User interface and media player

Hardware module: Here, the EEG signals from the user's brain are collected and passed to the software by the OpenBCI toolkit

Processing Module: Here, EEG signals are processed and classified into left-hand or right-hand movements.

User interface and media player: Here, the user can see the output generated by the controls. The music is played from the playlist as per the controls input by the user.

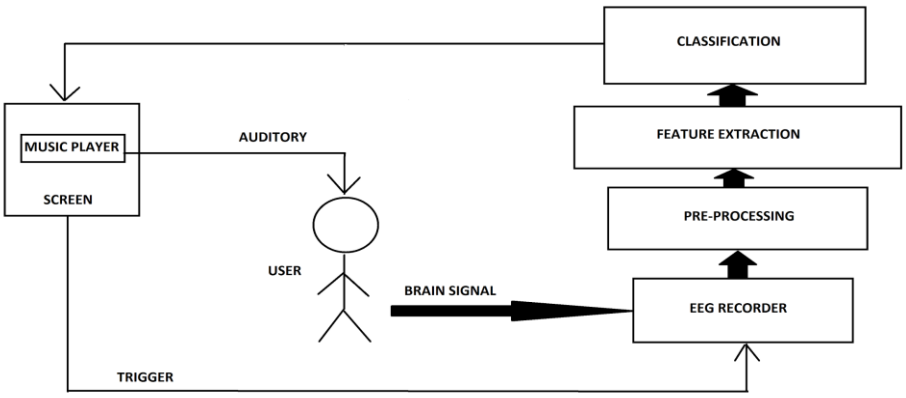

Fig 3.3: System Architecture

3.4 Data Flow Diagram

Data flow diagram (DFD) is a graphical representation of the flow of data that provides an overview of data flow in a system, transformations done on the data, files used and flow of results**.** It is also called as bubble chart which is used to represent a system in terms of the input data to the system. DFD is a good documentation aid which is understood by both programmer and nonprogrammers.

3.4.1 LEVEL 0: This diagram gives the outline of the system function when a user inputs a control. The control is in the form of imagined hand movement that is then mapped to the corresponding function in the media player. It shows the various steps that the data undergoes as part of the process before it is translated to the control.

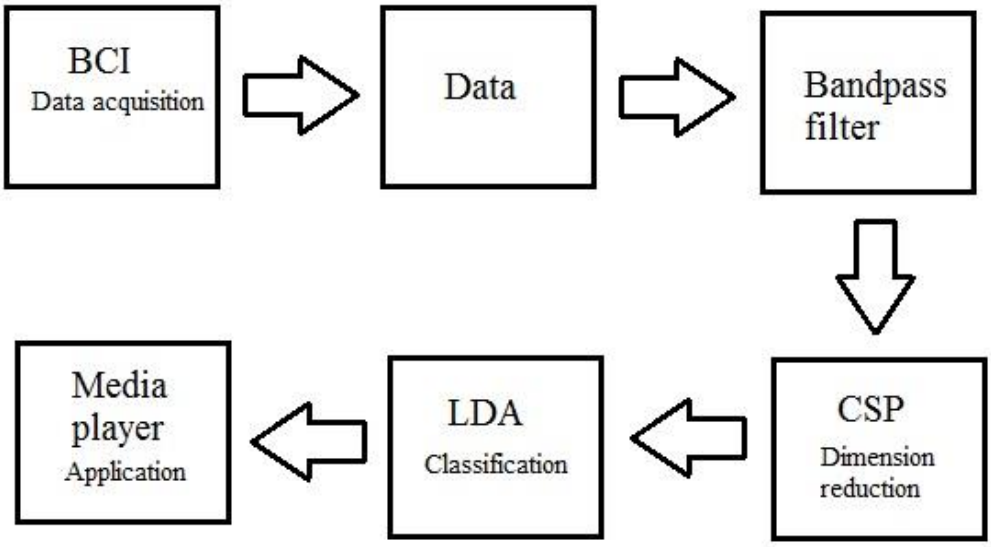

Fig 3.4.1: Data flow diagram of system – Level 0

3.4.2 LEVEL 1: This diagram gives the detailed dataflow of the system process that is happening when a user provides an input. This diagram shows the detailed processes and data flow that takes place in the BCI based media player. All the activities that take place in the system are shown below.

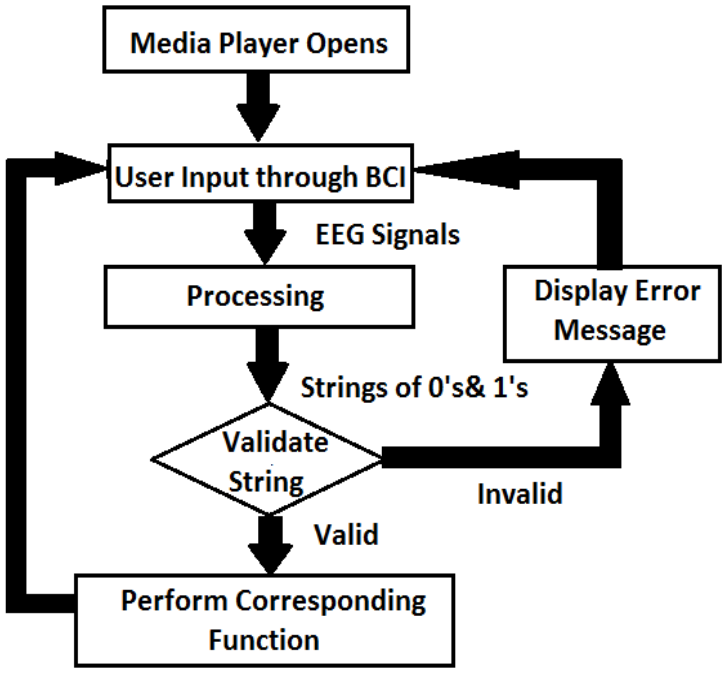

Fig 3.4.2: Data flow diagram of system – Level 1

3.5 Summary

This chapter provides details about the various functionality of our system. The system architecture and the dataflow diagram at different levels are also mentioned here. It provides a brief description about the architecture of our system. It also provides details about the goals and constraints of our system. The assumptions and dependencies of this system are also mentioned here.