Methodology for Android Application Development

* **Initiation**
* During this phase, efforts were made to clearly understand the objectives of the application to be developed.
* Objectives listed out were:
* The application must provide learning ***beyond the walls***.
* It must provide a platform to use the in-built features of the smart phone (sensors, camera, etc.) for experiments.
* It must generate analysis of the experiments (graphs).
* It must be user friendly and self- explanatory.
* **Planning phase**
* The basic requirements of the application were specified which will help achieve to the objectives discussed in the initiation phase.
* Functional requirements of the app were discussed which included the features that determines the quality of the application. All the modules of the application were listed.
* Requirements included
* Identifying users of the application.
* Developing the set of experiments that can be performed using the application.
* Providing readings in proper formats.
* Recording the readings and user information.
* Analysis of the experiment.
* Export options for the readings.
* **Design phase**
* The list of requirements that were developed in the planning phase was used to make design choices.
* One or more design choices were developed and the approved choice was implemented in the execution phase.
* In this phase the design of the database was also created which included deciding upon what tables to include in the database with proper constraints in real time.
* Also a phone (Samsung Galaxy S6) with maximum sensors available was identified and purchased for the purpose of testing and experimentation.
* **Execution phase**
* This phase includes the actual coding and building of the application.
* **Tools used:** To develop the mobile my lab application, eclipse ADT was used.
* **About eclipse:** Eclipse is an integrated development environment (IDE) used in computer programming, and is the most widely used Java IDE. It contains a base workspace and an extensible plug-in system for customizing the environment. Eclipse is written mostly in Java and its primary use is for developing Java applications, but it may also be used to develop applications in other programming languages.
* The two ends of the application (front end and back end) were separated according to the modules discussed.
* The front end includes the GUI of the application. Initially, screens were developed to give the application a structure. Screens included were :
* Login screen
* Registration screen
* Sensor List screen
* Experiment details screen
* Experiment screen
* Export to Gmail
* Backend (server side): Backend includes the server side code of the application. A cloud server was purchased on [digitalocean.com](http://digitalocean.com/) for the application. All the user information that was captured in the application was recorded on the server side in the format decided in the design phase of the database.
* Opencsv (jar) was used to implement the export feature.
* Achartengine (jar) was used to implement the graph feature.
* **Follow up phase**
* This phase was the concluding phase. The application that was developed at the end of the execution phase was shared among the team members for the experimentation and feedback.
* Changes were made as per the feedback.
* This phase also included the testing and analysis part.
* The app was tested against various test cases.
* Analysis was done to check how well the requirements of the initiation phase and planning phase were mapped in the application.