

## ANDROID-BASED CHEMICAL BOND APPLICATION

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### ABSTRACT

Chemical bonds are one of the basic materials and are important in understanding the mechanisms and chemical reactions and other materials such as stoichiometry and so on. Science holding material is considered and comprehended beginning from middle school up to college understudies. The numerous kinds of compound bonds that may happen in the joining of at least two components. Right now inquire about plans and fabricates an application by applying the rudiments of compound bonds as learning developments to encourage the comprehension of examining science. This application is structured utilizing the SDLC (System Development Life Cycle) framework advancement model or framework improvement life cycle. The SDLC model is utilized the deliberate, successive cascade strategy in building programming from this examination. For the programming language utilized is Java and utilizations the MySql Database.

**KEYWORDS:** Android application, RAD Model, Chemical Association, Java, MySql.

### I. INTRODUCTION

The fast improvement of information technology is indirectly a demand and effort in improving the quality of education in general and improving learning systems today [1]. Innovation can improve quality and reach whenever utilized admirably in the field of instruction and preparing, in light of the fact that innovation and training have a significant importance for the financial government assistance of the network by and large. The Education and preparing approach will be "just on time" and new learning methods will be two-way, shared and interdisciplinary [2]. The analysts imagine that cell phones will give numerous chances, this is because of an expansion and extension of mechanical chances, numerous innovative advancements are incorporated with the field of training [3]. The utilization of cell phones which is especially now opens the chance to utilize cell phones in the training procedure. The utilization of cell phones in the learning procedure is known as cell learning [4]. The proposed mobile application is designed to reduce manuals work and ease teaching and learning in the academic field [5]. The results of making an android-based application that focuses on basic chemistry, this application is expected to be used as a medium for the learning process.

### II. METHODOLOGY

The research method used in this study uses the system development model SDLC(System Development Life Cycle), the SDLC model that will be used is the Rapid Application Development (RAD) model. RAD is a type of incremental model.

RAD model is a software development model in which it uses minimal planning of rapid prototyping. this model is suitable to be implemented as the project is developed in parallel with the prototype and to make the product delivery faster. RAD model also reduce the overall development time due to the parallel development. The RAD methodology is illustrated in Figure 1 below.

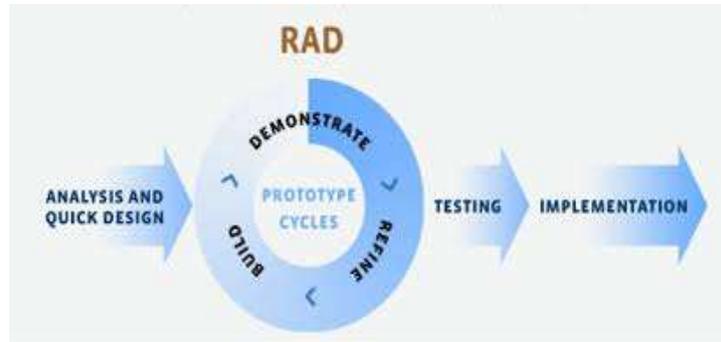


Fig-1: RAD Methodology

**1. Analysis:** The stage is used to discover the requirements of building a framework. At this stage information investigation will be done which will be taken for framework necessities. A preliminary investigation has been done in order to gather the information on learning method.

**2. Quick Design:** System configuration comprises of database plan and interface structure. This stage likewise intends to give an outline of the framework work process. Database configuration will be done later with calculated, logical and physical. Interface configuration is done to plan an easy to understand show while for later procedure configuration utilizing activity diagrams.

**3. Prototyping:** This phase will be the longest stage as it includes developing, demonstrating and refining the project using a prototype. Prototyping is useful for the designer to get a feedback from the user early in the project development. The user and developer will be engaged throughout the prototype cycle and the user will give continuous feedbacks until they are satisfied. This feedback will be used to do the refinement to the project until it meets the expectation. The final prototype will be used as the final application.

**4. Code:** Code is the implementation in the form of a program or coding to make the Design and Application Development of Android-Based Chemical Bonding. The programming language used is Java and uses the MySQL Database.

**5. Testing:** Tests completed to keep away from errors from the framework made. In the event that a error happens, the framework will be fixed again until the procedure results are as per what is normal. At this stage analysts who are engaged with the field of Chemistry will take an interest in testing, so the yield of the after effects of this application as per what is normal by the two researchers and as per the requirements of respondents later.

**6. Implementation:** At this stage, the system is completed tested based on its interfaces and also functionality. This phase involve all the coding part in order to make the system function correctly. All of the functionality must be running and working successfully according to the plan.

### III. MODELING AND ANALYSIS

**a. Fundamental Concepts of Application:** Mobile applications are software that runs on mobile devices such as smartphones or tablet PCs. Mobile technologies are becoming something that people must have in their life. Mobile by the specific terms means portability which is able to move or be moved freely or easily. People are used to mobile technologies and looking at it as normal that they can use to access and sharing information, taking photograph and communicate with their friends. The use of mobile technologies in education has growth rapidly nowadays. Mobile phones are the most commonly used for mobile technologies in learning.

**b. Android:** Android is an operating system that is developed by Google and also based on Linux kernel.

Android is an open source operating system, created by Google specifically for use on mobile devices (cell phones and tablets).

Android Can be programmed in C/C++ but most app development is done in Java (Java access to C Libraries via JNI (Java Native Interface)).It is Supports Bluetooth, Wi-Fi, and 3G and 4G networking.

This allows the user to modify and customize their apps such as changing the default browser from Google Chrome to Mozilla. This gives a plus point for Android over other operating system.

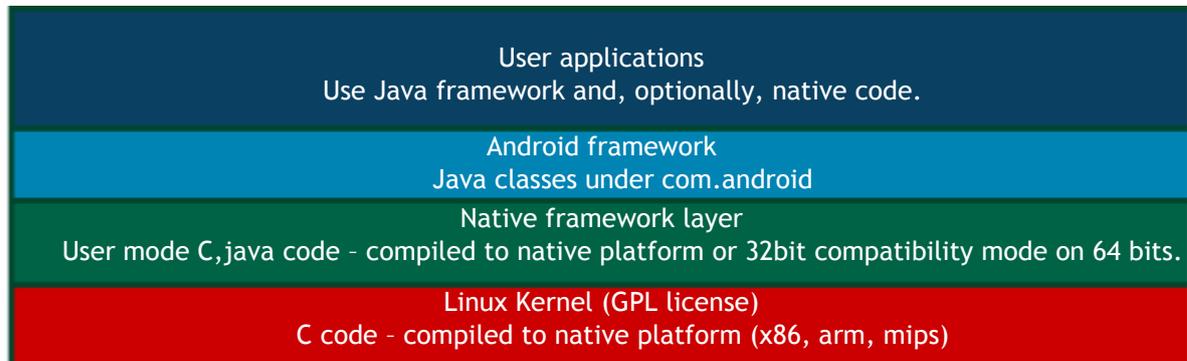


Fig-2: Android architecture

- c. **Chemical Bond:** Chemical bonding is a physical process that is responsible for the interaction of attractive forces between two atoms or molecules that causes a diatomic or polyatomic compound to become stable. There are several types of chemical bonds that may occur in the joining of two or more elements, namely:
- Ionic Bonding
  - Covalent bonds
  - Metallic bonding
  - Hydrogen bonding

Each bond has its own characteristics that distinguish between bonds. These differences generally cause differences in the physical and chemical properties of compounds formed from these bonds [9].

#### IV. RESULTS AND DISCUSSION

The process of making this application involves the role of prospective users among high school students. Android-based application was made as a medium of learning a basic chemistry. In this application offers several features. This approach is relevant in teaching the chemistry as the students will need to observe and interpret what they learnt through their own understanding. Hence, this is applicable in mobile application for chemistry as this application will encourage the students to do virtual experiments where the students can observe, understand and construct their own understanding on the chosen experiments. In Figure 3 below is the initial appearance of the application.



Fig-3: Initial display application

On the main menu, there are several options, namely the periodic table, about the application and exit the application. In the periodic table selection, if selected then will display a periodic table of chemical elements, such as Figure 4 below

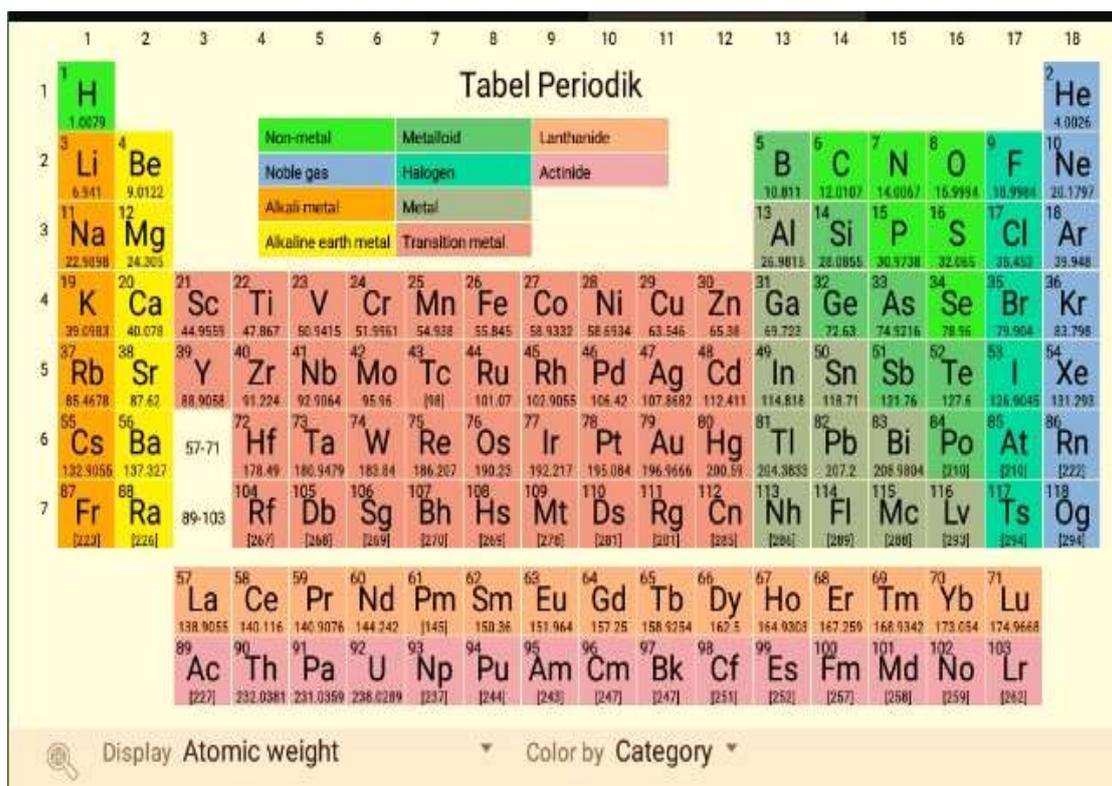


Fig-4: Periodic Table

In this feature, the periodic table display can be adjusted to the needs of the user, on the interface there is a display menu for the periodic table, whether by category or color, or if you want to display elements of atoms or melting points or other, it can be adjusted to the user's needs during use. In this feature, detailed elements can be seen by tapping one of the elements, then the element details will appear like Figure 5 below.



Fig-5: Element Details

## V. CONCLUSION

This is give benefits to the community especially chemistry students in increasing their understanding to chemistry. In this project, the current target for the applications is to provide virtual chemistry for certain topics. it is suggested that this apps can be improvise to provide more information for the students to explore it. The conclusion that the application was very helpful and interactive in its use and easy to learn to the students. Other than that, it is also important to maintain the user interactivity and case of use in order to make this app successful and better than the existing apps in the market.

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