

# Circuit-Konek: An Android Mobile Based Breadboard Application in Stimulating Digital Circuit

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**Abstract**— *The Technology Project Proposal aims to develop an android-based breadboard application to help the beneficiary to lessen their time buying components and to avoid short circuit or burning circuit wires. The study aims to develop “Circuit-Konek: An Android Mobile Based Breadboard Application in Simulating Digital Circuit” that can be used by every student at College of Computer Studies of Our Lady of Fatima University – Valenzuela Campus not just by group but can be used by an individual. Portability is the main reason of this proposed project.*

**Keywords**— *Breadboard, Android, Application, Simulation.*

## I. INTRODUCTION

Technology is vastly and commonly used in our everyday life for centuries. Every day, technology advances as people grow and progress, creating something new for the future generations. Technology is a real-life changer as it is responsible for making it easier and more manageable. It continues to amaze us with its advances from time to time. New technologies are developed and introduced to help and efficiently use time and tools in a way that human's benefit.

Android application was introduced in 2008 as an operating system used for smartphones. Today, there are endless applications or 'apps' for an android-based smartphone and it continues to grow, making more useful apps for everyday use for human convenience. Of all those apps, entertainment, social media, and game apps, are the most popular nowadays. Each of them has its own uniqueness, innovation, and usefulness. Some of them have millions and billions of downloads from all over the world. In this time of pandemic, online classes have started, giving us a difficult time to adjust in terms of learning. However, due to some of the apps, we can go through these online classes.

The use of 'Prototype' is one thing that was introduced to people where you can try something out in the 'preliminary model' then applying developments on the actual product. A breadboard is a prototype of an electronic circuit, to test some electronic components before using an actual electronic circuit. Getting a breadboard means you must go to an electronics shop to purchase it. However, in this time of pandemic, people do not want to go outside of their homes and risk their health. Buying from an online store is also risky because if the product is defective, it will be a hassle to return the product to the seller and replace it with a new one. The components used for a breadboard such as resistors, capacitors, integrated circuit, transistors, jumper wires and even the battery to make it work are prone to burning. These are some problems that people encounter most of the time.

In this study, with the help of Our Lady of Fatima University, we will create a prototype breadboard in an application that will solve some of these problems we encounter while using a hardware. It will be handy, easier, and flexible to use, and there would be no need to buy the breadboard itself and its components as it will be more budget-friendly especially to students who are studying the basic electronic components.

## II. REVIEW OF RELATED LITERATURE

- A. Based on the journal “Digital Logic Gate Simulation using Arduino Microcontroller” (June 2017), that the world today is seeing the enormous development of technology and practice. Electronic products have been a part of our lives and it's almost difficult to survive without them. In fact, it is attributed to improved operating performance and ease of processing, expense, and availability for the following reasons.
- B. Based on a journal “An Online Lab for Digital Electronics Course Using Information Technology Support” (February 2016), that is an IT implementation for schooling, aimed at developing an online lab course model with a shared framework using a desktop networking app. Participants in the digital electronics lab course were grouped into classes, each composed of three students. As offline software that can be downloaded remotely, a desktop sharing tool was used for the digital circuit simulator. The findings indicate that in an online lab course, the application should be used to introduce a collaboration atmosphere
- C. Based on the thesis title “AutoFritz: Autocomplete for Prototyping Virtual Breadboard Circuits” (May 2019), the development of virtual breadboard circuits, they implemented the principle of autocomplete, typically used in web search, text processing, and programming. The program provides the user with a list of recommended components based on the one freshly inserted by a user in a virtual breadboard with autocomplete.
- D. According to the book “Comparison of simulation- based

and hands-on teaching methodologies on students' learning in an engineering technology program" (August 2015), using simulators as a teaching method is popular, both in academic areas and in business areas since simulations are known as an easy and reliable means of teaching and studying complex and dynamic processes in engineering education.

- E. Based on the book "The Effect of Every Circuit Simulator to Enhance Motivation and Students Ability in Analysing Electrical Circuits" (January 2017), the efficiency of human capital in higher education is demonstrated by the success of students in each subject in terms of know-how and skills. One of the subjects taught in the Physics Education Research Program of the Samawa University Faculty of Teacher Training and Education is Basic Electronics I.

### III. DESIGN AND METHODOLOGY

#### A. Research Design and Methodology

This chapter of skeletal design will be developing, this will ensure that the data obtained will effectively answer the research question, Methodology is a strategy researcher will use to implement the design plan of the project.

##### a. Conceptual framework

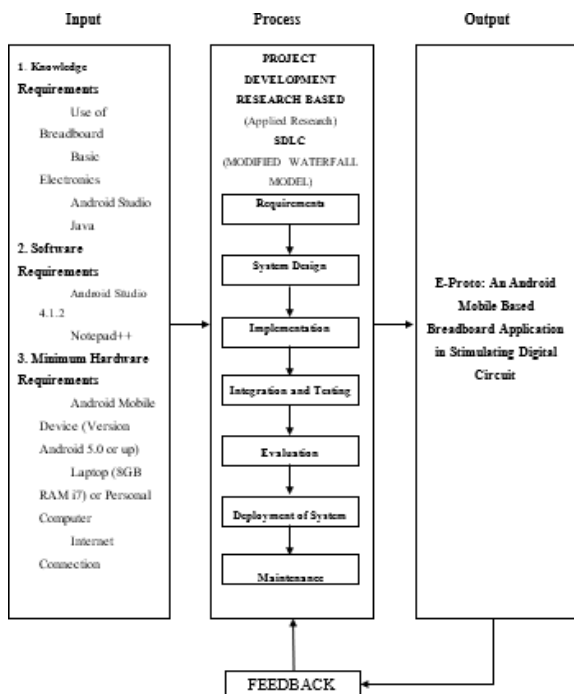


Figure 1: Conceptual Framework of Circuit-Konek: An Android Mobile Based Breadboard Application in Stimulating Digital Circuit

The Figure 1 represents the construction of the system "Circuit-Konek: An Android Mobile Based Breadboard Application in Stimulating Digital Circuit". The input consisted of Reading Materials, these are the published or not materials that are valuable in creating the system, unity, materials such as Android phone and laptop and software, needed to develop the Android Studio 3.5 application, as well as MS office for paperwork. The process consists of

determining needs, building prototype, and evaluating prototype, a flexible and on-going evolution that helps the system reach the customers satisfactorily. The output consisted of the respondents' instant answers to a potential implementation and the application's flow.

#### B. Data Flow Diagram

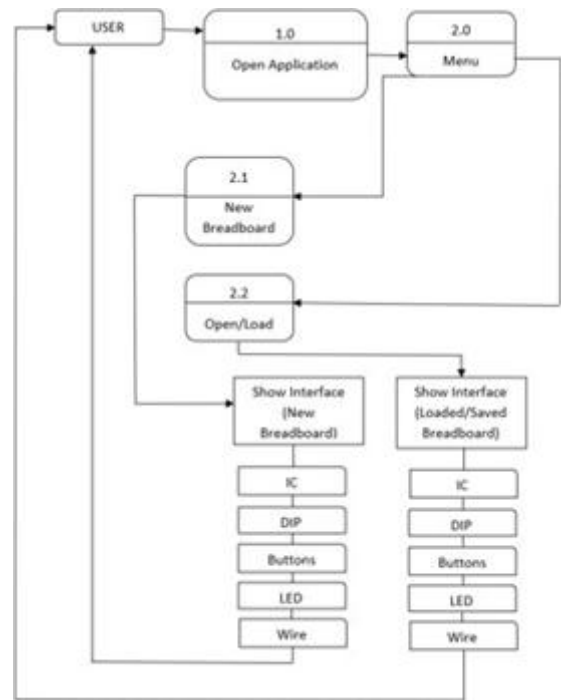


Figure 2: The Data Flow Diagram of Circuit-Konek: An Android Mobile Based Breadboard Application in Stimulating Digital Circuit

The figure 2 is the data flow diagram of Circuit-Konek. It starts with the USER to open the application Circuit- Konek, upon opening, it will show the menu which consist of 1. New Breadboard and 2. The Open or Load of the previous saved file. Upon creating or opening a saved file, the system will show the user the breadboard interface, and will show options such as IC, DIP, Buttons, LED, and wires.

#### C. Presentation of Data

TABLE 1: Role of Respondents

Respondent Role	Frequency	Percentage
IT Expert	5	25%
Students	30	75%
Total	35	100%

The 35 participants are divided into two (2) different categories, the IT experts, and the students. The table indicates 25 percent by the IT specialist and 75 percent by the client this mean the proponents prioritize the convenience for the students.

#### D. Procedure for the Calculation of Data

The weighted mean of the data set provided by  $x_1, x_2, x_3 \dots x_n$  may be regarded to be the total data multiplied by the corresponding weight or frequency. Where:  $w_i$  = the weight of the frequency,  $x_i$  = the given data,  $w$  = sum of weights or frequencies

#### IV. CONCLUSION

The proposed system, Circuit-Konek was an offline application that can be used by the students by just downloading it through APK. They can perform any basic breadboard projects without buying anything that you need. It is also less time consuming since it is just one click away.

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