

## Android Based Smart Department

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**Abstract** - These Technology advancements have made the implementation of embedded systems within department appliances. Automation of the surrounding environment of a modern human being allows increasing his work efficiency and comfort. This project presents a technology where the user controls the devices through smart phones. Android based smart department System has been designed for mobile phones having Android platform to enable internet which controls a number of home appliances like lights, fans and many more using suitable on/off switching devices. Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. Internet is an open standard specification for an Android based smart department. The controlling device of the whole system is a Microcontroller. The controller acts accordingly to switch connected department appliances.

**Key Words:** Micro Controller, Relay, Web server, Android Application, Atomized devices.

### 1. INTRODUCTION

With the continuous growth of mobile devices in its popularity and functionality the demand for advanced ubiquitous mobile applications in people's daily lives is continuously increasing. Utilizing web services is the most open and interoperable way of providing remote service accessor enabling applications to communicate with each other. An attractive market for department automation and networking is represented by busy collages and individuals institutes. Internet things can be described as connecting everyday objects like smart phones, internet televisions, sensors and actuators to the internet where the devices are intelligently linked together to enable new forms of communication amongst people and themselves . The significant advancement of internet things over the last couple of years has created a new dimension to the world of information and communication technologies. The

advancement is leading to anyone, anytime, anywhere (AAA) connectivity for things with the expectation being that this extend and create an entirely advanced dynamic network of internet things. The internet things technology can be used for creating new concepts and wide development space for smart department in order to provide intelligence, comfort and improved quality of life.

With the dramatic increase in smart phone users, smart phones have gradually turned into an all-purpose portable device and provided people for their daily use. In this project, a low cost wireless controlled smart department system for controlling and monitoring the department environment is presented. An embedded micro-web server with real IP connectivity is used for accessing and controlling appliances and other devices remotely from an Android based app, which can be used from any Android supported device. Voice activation for switching applications has also been incorporated to aid users especially for the elderly and the disabled persons using that data. At present, there is little platform-level support and standardization for verifiable data protection in the cloud. On the other hand, user data protection while enabling rich computation is challenging. It requires specialized expertise and a lot of resources to build, which may not be readily available to most application developers. We argue that it is highly valuable to build in data protection solutions at the platform layer: The platform can be a great place to achieve economy of scale for security, by amortizing the cost of maintaining expertise and building sophisticated security solutions across different applications and their developers.

### 2. EXISTING SYSTEM

Smart home appliance is an interface between the remote control with its mobile or remote control and a home reliever. For each device, in order to accomplish this interface design process was taken using the micro controller and arduino for controlling some application in the home manually by using a remote control and automatically through different sensors. Each system application will be discussed. We use micro controller which 89V51RD2 secondary connectivity between remote or smart

phone and micro controller is established through modules. The two previous modules can be connected either to micro controller. A specific android application has been designed such that different home electronic devices can be controlled using a smart phone remotely.

Before developing the tool it is necessary to determine the time factor, economy and company strength. Once these things are satisfied, ten next steps are to determine which operating system and language can be used for developing the tool. Once the programmers start building the tool the programmers need lot of external support. This support can be obtained from senior programmers, from book or from websites before building the system the above.

### 3. PROPOSED SYSTEM

Following figure illustrates the overall control function of the system. The projected system works using the smartphone application. The smartphone application is nothing but an android application which is the main source for giving the instruction to the internet module.

In the proposed system, a low cost department system for remotely controlling and monitoring the smart department environment is presented. An overview of the proposed system architecture is shown in Figure 3.1. The system consists of an app developed using the Android platform and an Arduino Ethernet based micro web-server. The Arduino microcontroller is the main controller that hosts the micro web-server and performs the necessary actions that needs to be carried out. The micro controller device and relays are directly interfaced to the main controller. The smart department environment can be controlled and monitored from a remote location using the smart department app, which will communicate with the micro web-server via the internet. Any internet connection via Wi-Fi or 3G/4G network can be used on the user device.

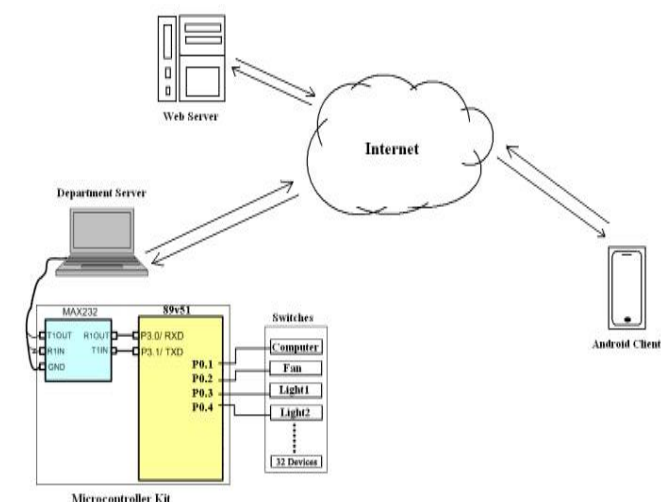


Fig-1: System Architecture

## 4. METHODOLOGY

### 4.1 Proposed Work

Following are the modules in the project

#### 4.1.1. Android Application:

In this phase the Android application for smart department is developed. This application will be developed by using java programming language

#### 4.1.2. Attach the controller kit server:

The micro controller kit 89V51RD2 is connected to the college or institute server and he will give the response to the attached devices to micro controller kit.

The programming coding for server will be implemented in VB.NET or C# programming language.

#### 4.1.3. Develop the Micro controller kit:

The micro controller kit 89V51RD2 is developed by using Embedded C programming language with different pins. To that micro controller kit we can connect maximum 32 departmental devices.

#### 4.1.4. Use Relay For Device:

After development of micro controller kit, the device is getting connected to kit via wiring but we use the relay in between kit and device.

The main function of relay is to convert 230 volt current to 5 volt current.

## 4.2 Design Approaches

### 4.2.1. DFD Level 0:-

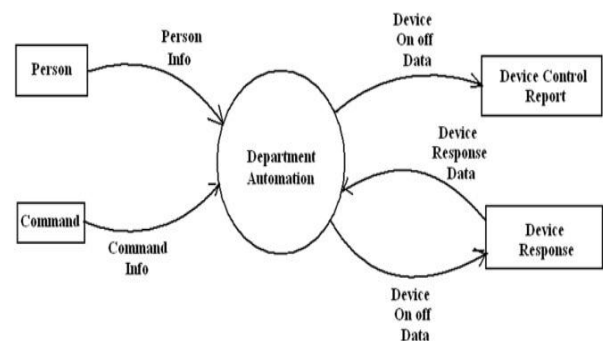
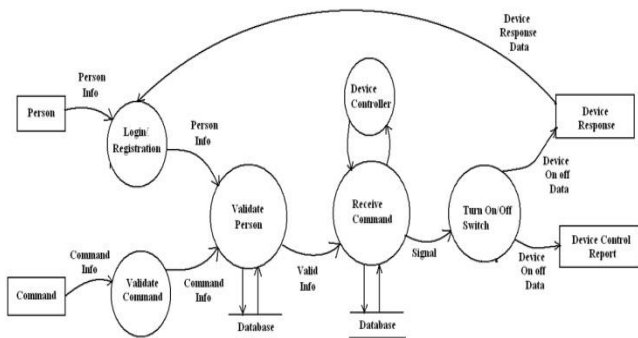


Fig- 2: DFD Level 0

Above DFD level 0 shows the data flow into the system. In the level 0 the user is going to login to the system by

providing the user data as username (Email Id) and Password. This is the general view of a system to any user for study of this system.

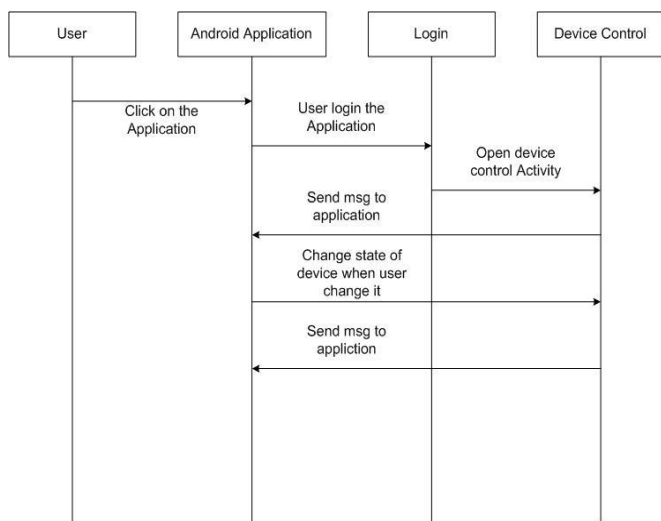
**4.2.2 DFD Level 1:-**



**Fig- 3: DFD Level 1**

Above DFD Level 1 shows more information about the system. The level 1 shows that the user request for controlling the devices is transferred to the web server. The Department server gets the requests or commands from web server and transfers them to the microcontroller kit. The microcontroller kit sends the ON/OFF signals to the devices. All the responses are given back. This is the complex view of a system to any user for study of this system.

**4.2.3 Sequence Diagram:**



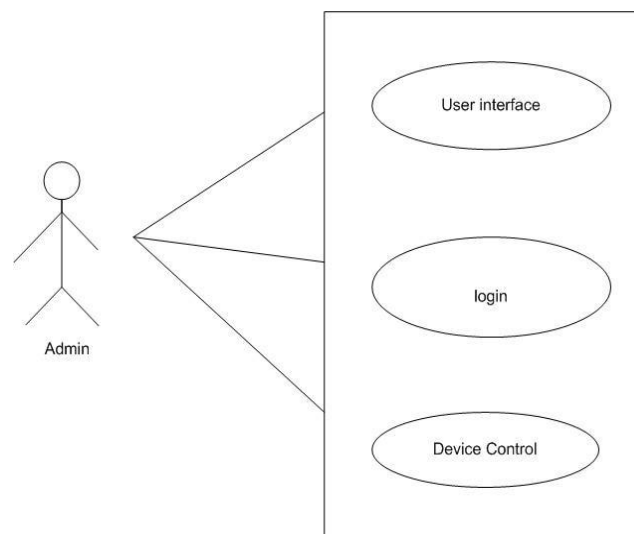
**Fig-4: Sequence Diagram**

Above Sequence diagram is representation of sequence of operations in the system. This is the general view of a

system to any user for study of this system for completing various tasks sequentially.

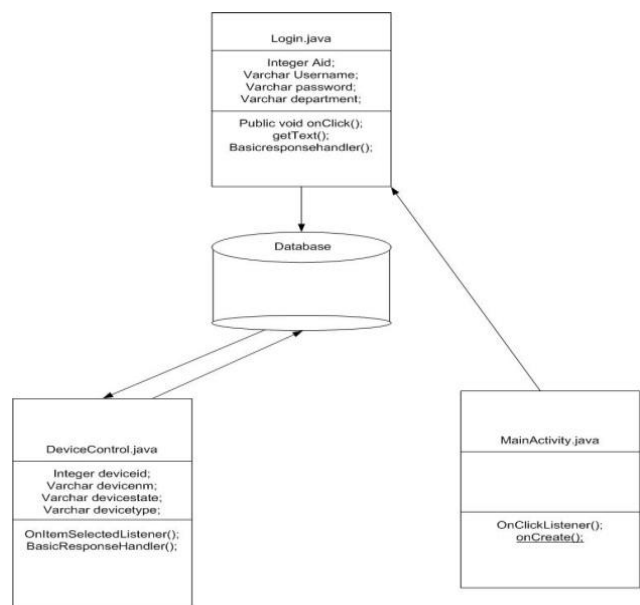
**4.2.4. Use Case Diagram:**

Use case diagram shows the use of resources in the system. This is the use of system in the project. Here the Admin and the user are the 2 Actors who perform the actions or events on the use cases like registration, login, and Device control activities.



**Fig-5: Use Case Diagram**

**4.2.5 Class Diagram:**



**Fig-6: Class Diagram**

Above Class diagram shows the classes present in the system and their relation between the classes of Android based smart department system. Here two activities like new activity and login activity are dependent on main activity. The device control activity depends on login activity.

## 5. CONCLUSIONS

We hereby conclude that, this project is going to help the human beings for making their work to be done in less time span and more simple and efficient. This system helps us to save the resources like fuel, electricity and most important is the time.

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