# INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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# HOME AUTOMATION AND SECURITY SYSTEM USING ANDROID ADK

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**ABSTRACT**

*Android ADK. The configuration is in light of a standalone implanted framework board Android ADK(Accessory Development Kit) at home. Home machines are associated with the ADK and correspondence is secured between the ADK and Android cell phone or tablet. The home apparatuses are joined with the data/yield ports of the installed framework board and their status is gone to the ADK. We would build up a validation to the Today we are living in 21st century where mechanization is assuming vital part in human life. Home mechanization permits us to control family unit apparatuses like light, entryway, fan, AC and so on. It additionally gives home security and crisis framework to be actuated. Home robotization alludes to lessen human endeavors as well as vitality proficiency and efficient. The principle goal of home robotization and security is to help crippled and old matured individuals which will empower them to control home apparatuses and alarm them in basic circumstances. This paper put advances the configuration of home robotization and security framework utilizing framework for approved individual to get to home apparatuses. The gadget with ease and versatile to less adjustment to the center is much essential. It introduces the outline and execution of computerization framework that can screen and control home apparatuses by means of android telephone or tablet.*

## KEYWORDS

Home Automation and Security, Arduino, Embedded Systems, Android ADK, Android phone, Tablet.

## I. INTRODUCTION

Home mechanization is robotization of the home, housework or family unit movement. Home computerization may incorporate incorporated control of lighting, HVAC (warming, ventilation and cooling), apparatuses, and different frameworks, to give enhanced comfort, solace, vitality effectiveness and security. The idea of home mechanization has been around for quite a while and items have been available for a considerable length of time, however nobody arrangement has gotten through to the standard yet. Home mechanization for the elderly and crippled can give expanded personal satisfaction to persons who may somehow oblige parental figures or institutional consideration. It can likewise give a remote interface to home machines or the mechanization framework itself, through phone line, remote transmission or the web, to give control and observing by means of a PDA or web program. This paper will depict the methodology which we are executing to control different home machines with Android advanced mobile phone.

## II. LITERATURE SURVEY

According to our review right now there exists no framework at less expensive rates. Different frameworks are difficult to introduce, hard to utilize and keep up. Current frameworks are for the most part restrictive and shut, not extremely adjustable by the end client.

N. Sriskanthan [1] clarified the model for home mechanization utilizing bluetooth through PC. Anyway shockingly the framework needs to bolster portable innovation.

Muhammad Izhar Ramli [2] composed a model electrical gadget control framework utilizing Web. They likewise set the server with auto restart if the server condition is as of now down.

Hasan [5] has added to a phone and PIC remote controlled gadget for controlling the gadgets pin check calculation has been presented where it was with link arrange yet not remote correspondence.

Pradeep G [4] proposed home robotization framework by utilizing bluetooth which spares part of force and time utilizing system to spare the preloaded rundown by not making it to setup association all the time when needed.

Al-Ali and Al-Rousan [3] displayed a configuration and execution of a Java-based mechanization framework through World Wide Web. It had a standalone installed framework board incorporated into a PC-based server at home.

Amul Jadhav [6] added to an application in an all inclusive XML group which can be effortlessly ported to whatever other cell phones as opposed to focusing on a solitary stage.

**FIGURE 1: HOME AUTOMATION SYSTEM BLOCK DIAGRAM BY R. PIYARE [8]**



**FIGURE 2: CELL PHONE GUI FOR CONTROLLING THE HOME APPLIANCES BY R PIYARE [8]**



R.Piyare [8] have presented configuration and usage of a minimal effort, adaptable and remote answer for the home mechanization.

Jitendra R. [7] demonstrated that with the ZigBee organize how to wipe out the difficulty of wiring if there should be an occurrence of wired mechanization. There is likewise extensive measure of force sparing conceivable, working extent is more than Bluetooth.

Google and Microsoft have as of late entered the home robotization space. At 2011 I/O gathering, [9] Google reported Android@Home. Google's first standard for Android gadgets to speak with outside equipment. The Android Open Accessory Standard and the Accessory Development Kit (ADK) is the key for speaking with equipment and building outer frill for Android gadgets. Android powers countless cell phones in more than 190 nations around the globe. [10] It's the biggest introduced base of any portable stage and developing quick consistently another million clients.

Microsoft will be likewise working on a venture called HomeOS, [11] a working framework for the home.

## III. IMPLEMENTATION

### A. ANDROID

For this home computerization and security framework we are focusing on Android stage since it has tremendous market and open source. Android is a product stack for cell phones that incorporates an working framework, middleware and key applications. The Android OS will be construct with respect to Linux. Android Applications are made in a Java-like dialect running on a virtual machine called " Dalvik' made by Google. The Android SDK gives the apparatuses and APIs important to start creating applications on the Android stage utilizing the Java programming dialect. Embellishment mode will be a highlight of Android OS since form 2.3.4 Gingerbread and 3.1 Honeycomb or more.

### B. SOFTWARE DESIGN

As examined before we will be creating Android application. The application comprises of primary capacity like Light controlling, Door controlling, Smoke discovery and Temperature sensing. At the point when the application begins client is initially confirmed, if client is approved he will be explored to principle screen. The primary screen has a rundown of all capacities among which client can choose any one capacity which he need to control. In the wake of selecting a capacity he would have the capacity to see a current status of a specific gadget. On the off chance that client wishes, he can empower or handicap planned gadget.
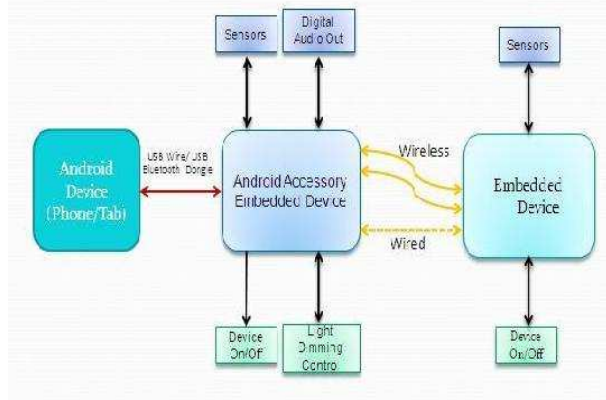
### C. ANDROID ADK

ADK remains for Accessory Development Kit. Android extra is a physical embellishment that can be joined to your Android gadget. [12] These specific gadgets perform particular activities. For USB assistants to be upheld on a specific gadget, there must be backing for the adornment mode, a unique means of interfacing over the USB port. This permits information exchange in the middle of gadgets and outside peripherals.

The framework is sufficiently keen to enact caution when smoke is recognized or it is modified to auto on/off lights amid late night hours. On the off chance that room temperature goes high or low it can consequently conform fan/AC according to the temperature. It has voice route which is particularly advantageous to visually impaired individuals.

**FIGURE 3: ARDUINO MEGA ADK**

**FIGURE 4: BLOCK DIAGRAM OF HOME AUTOMATION AND SECURITY SYSTEM USING ANDROID ADK**



The Android Open Accessory Development Kit (ADK) is a reference usage of an Android Open Accessory, in view of the Arduino [15] open source hardware prototyping stage. The frill's equipment outline documents are given as a component of the pack to help equipment manufacturers begin building their own adornments.

The Arduino ADK [15] is a microcontroller board in light of the ATmega2560. It has a USB host interface to unite with Android based telephones, in view of the MAX3421e IC. The principle equipment and programming parts of the ADK incorporate " Arduino Mega ADK" , which was planned to work wi th Android. The " Ardui no Mega ADK" board is a deri vative of the " Arduino Mega 2560" . The host chip permits any USB gadget to unite to the Arduino which we will later actualize as an Android USB embellishment. The ADK board gives enter and yield sticks that you can actualize through the use of connections called "shields." With an Android gadget and the " Mega ADK" , you can utilize whatever sensors and actuators you require to make your own extras. This may incorporate a LED yields, and temperature and light sensors.

**D. ANDROID OPEN ACCESSORY PROTOCOL**

Android Open Accessory [13] backing permits outside USB equipment (an Android USB frill) to interface with an Android-fueled gadget in a unique adornment mode. At the point when an Android-controlled gadget is in extra mode, the associated frill goes about as the USB host (controls the transport and lists gadgets) and the Android-fueled gadget acts in the USB adornment part. Android Open Accessory Protocol, [14] permits to recognize Android-fueled gadgets that bolster adornment mode. Extra mode is eventually subject to the gadget's equipment and not all gadgets bolster adornment mode.

Android Open Accessory backing is incorporated in Android 3.1 (API Level 12) and higher, and bolstered through an Add- On Library in Android 2.3.4 (API Level 10) and higher. Android 4.1 and higher has support for sound yield over a USB association or Bluetooth An Android USB frill must hold fast to Android Accessory Protocol, which characterizes how an adornment identifies and sets up correspondence with an Android- fueled gadget. [14] as a rule, an embellishment ought to do the accompanying steps:

1. Sit tight for and recognize joined gadgets
2. Focus the gadget's embellishment mode support
3. Endeavor to begin the gadget in embellishment mode if necessary
4. Create correspondence with the gadget on the off chance that it underpins the Android embellishment convention.

The Android Open Accessory Protocol 2.0 [16] includes two new highlights: sound yield (from the Android gadget to the embellishment) and backing for the frill going about as one or more Human Interface Devices (HID) to the Android gadget.

## IV. BLOCK DIAGRAM

Android Device - It is the gadget through which application communicates with sensors.

USB Connector - It is the equipment port in the unit through which the USB gadget is joined to the inserted pack.

Android Accessory Development Kit(ADK) - ADK permits Android Phone to go about as USB Device where as the " Arduino- Mega2560 ADK" wi ll act as USB Host. This permits correspondence between Android Powered Devices (like telephone, tablet) and outside Hardware like modern controls.

Installed Device - It comprises of individual inserted packs alongside separate sensors.

## V. APPLICATIONS

Taking after are the utilizations of Home Automation and Security System

- Medical caution/ teleassistance.
- Precise and safe visually impaired control.
- Detection of flame, gas breaks and water spills.
- Smoke locator can recognize a fire or smoke condition, bringing on all lights in the house to squint to alarm any individual of the house to the conceivable crisis.
- The framework can call the property holder on their cell telephone to alarm them, or call the fire division or caution checking organization.
- as far as lighting control, it is conceivable to spare vitality when hours of squandered vitality in both private and business applications via auto on/off light at evening in all real city office structures, say after 10pm.
- Control and joining of security frameworks furthermore the potential for focal locking of all border entryways and windows.
- Security cams can be controlled, permitting the client to watch movement around a house or business right from a Monitor or touch board.
- Security frameworks can incorporate movement sensors that will identify any sort of unapproved development and advise the client through the security framework or by means of cell.
- An radio framework permits correspondence by means of an amplifier and noisy speaker .

## VI. FUTURE WORK

Taking a gander at the current circumstance we can construct cross stage framework that can be conveyed on different stages like iOS, Windows. Confinement to control just a few gadgets can be evacuated by expanding mechanization of all other home machines. Security cams can be controlled, permitting the client to watch movement around a house or business. Security frameworks can incorporate movement sensors that will distinguish any sort of unapproved development and tell the client. Extent of this venture can be extended to numerous ranges by not limiting to just home. It will be adaptable to bolster different wired and in addition remote advances like Bluetooth, Zigbee, Wi-Fi, World Wide Web.

## VII. CONCLUSION

This is a continuous venture. Our prime target is to aid impaired/old matured individuals. This paper gives fundamental thought of how to control different home machines and give a security utilizing Android telephone/tab. This venture is in view of Android and Arduino stage both of which are FOSS(Free Open Source Software). So the general execution expense is exceptionally shabby and it will be reasonable by a regular individual. Looking at the current situation we have picked Android stage so that the majority of the individuals can get advantage.

The outline comprises of Android telephone with home mechanization application, Arduino Mega ADK. Client can associate with the android telephone and send control sign to the Arduino ADK which thusly will control other implanted gadgets/sensors. We have talked about a straightforward model in this paper however in future it can be extended to numerous different regions.

## VIII. ACKNOWLEDGMENT

We recognize the endeavors and diligent work by the specialists who have contributed towards advancement of the distinctive home mechanization frameworks. We additionally recognize the endeavors of the analysts of the diary for the proposals and alterations to enhance the nature of the paper and to help set up the cam prepared duplicate of our paper.

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