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Project Report On

IOT Framework for Warehouses

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ABSTRACT

The “Internet Of Things”(IoT) is becoming an increasingly growing topic of conversation and research. It has the potential to impact not only how we live but also how we work. The concept of IoT is basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from cellphones, coffee makers, washing machines, headphones, lamps, wearable devices and almost anything else you can think of. This also applies to components of machines, for example a jet engine of an airplane or the drill of an oil rig. The IoT is a giant network of connected “things” (which also includes people). The relationship will be between people-people, people-things, and things-things.

A warehouse management system (WMS) is a software application that supports the day-to-day operations in a warehouse. WMS programs enable centralized management of tasks such as tracking inventory levels and stock locations. Our app gives information about the levels of the items in a particular container.

INTRODUCTION

Warehouse Management is an android app that realizes this very model, and helps the warehouse managers to manage stock in a very easy manner. It minimizes the visit that the warehouse managers do, to keep track of stock level. It also decreases the time taken to find the container almost empty to be reloaded.

A warehouse manager can login to the app with his unique username and password and then he/she can check the stock level in the containers. He/She can also get the information of the stock and user logged-in details.

PLATFORM AND COMPATIBILITY

The application is compatible with all devices running Android API Level >15 or Ice Cream Sandwich (Android 4.0) and above.

TOOLS

Hardware tools:

1. Arduino Uno Board

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

2. Ultrasonic sensor(HC-SR04)

The HC-SR04 ultrasonic sensor uses sonar to determine distance to an object like bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package. From 2cm to 400 cm or 1” to 13 feet. It operation is not affected by sunlight or black material like Sharp rangefinders are (although acoustically soft materials like cloth can be difficult to detect). It comes complete with ultrasonic transmitter and receiver module.

Software Tools:

1. Android Studio

Android Studio is the official IDE for Android application development, based on IntelliJ IDEA. On top of the capabilities you expect from IntelliJ, Android Studio offers:

- Flexible Gradle-based build system
- Build variants and multiple apk file generation
- Code templates to help you build common app features
- Rich layout editor with support for drag and drop theme editing
- Lint tools to catch performance, usability, version compatibility, and other problems

2. Arduino IDE

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X and Linux.

The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board.

3. Node.js

Node.js is a JavaScript runtime built on Chrome's V8 JavaScript engine. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient. Node.js' package ecosystem, npm, is the largest ecosystem of open source libraries in the world.

4. MySQL

It is an open-source relational database management system (RDBMS).MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open-source web application software stack (and other "AMP" stacks). LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python". Free-software open-source projects that require a full-featured database management system often use MySQL.

RESULTS AND DESCRIPTION

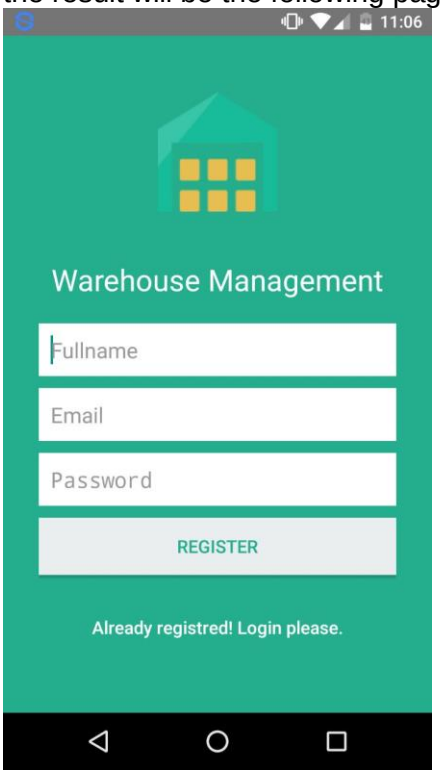
Each page from now on highlights the results of the project and the screenshot for each of the activity is shown along with its description and detailed functionality.

LOGIN PAGE:

This activity forms the first page of our application. It is displayed as soon as the user opens the application.

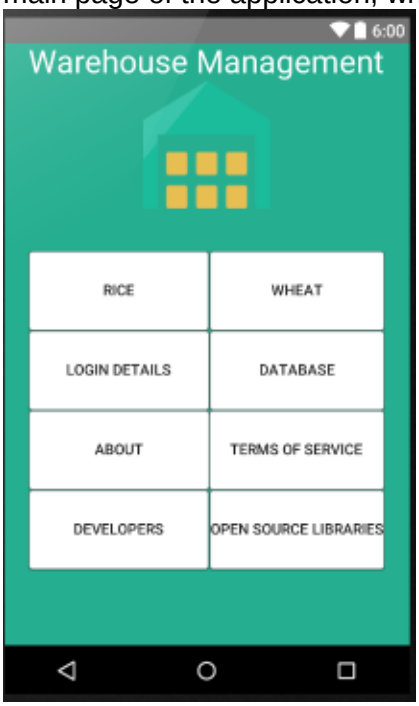
REGISTER PAGE:

If the user is not a registered user, he/she can register by clicking on “Sign up now” and the result will be the following page.



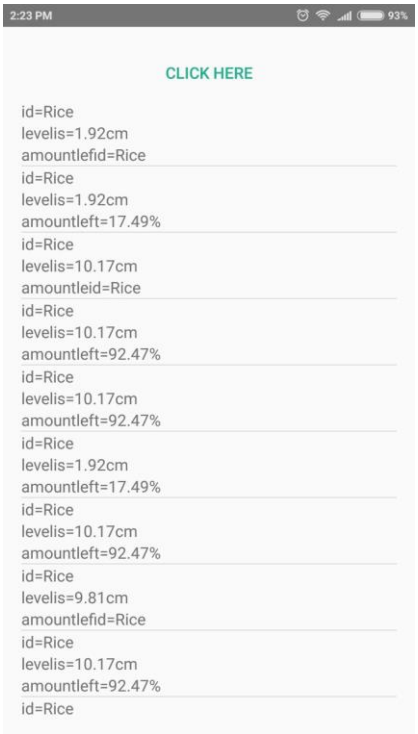
MAIN PAGE

This activity displays the home page of the Warehouse Management app. This is the main page of the application, where all the details can be accessed once the button is clicked.



RICE

This activity displays the sensor values, i.e. the stock level in the container which is filled with rice.

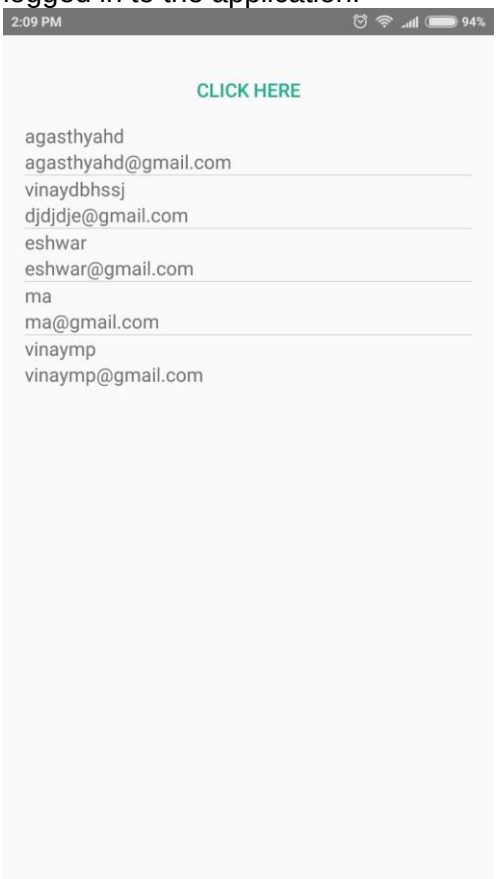


WHEAT

This activity displays the sensor values, i.e. the stock level in the container which is filled with wheat.

LOGIN DETAILS

This page displays the user logged in details. It contains the list of all the users that have logged in to the application.

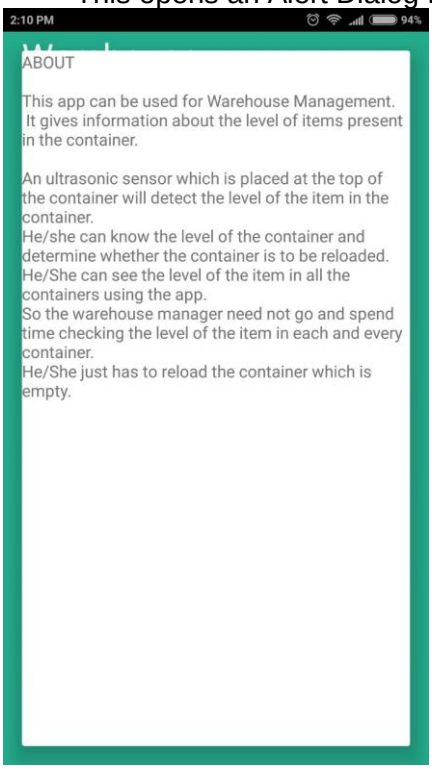


DATABASE

It contains the list view of all the stock items.

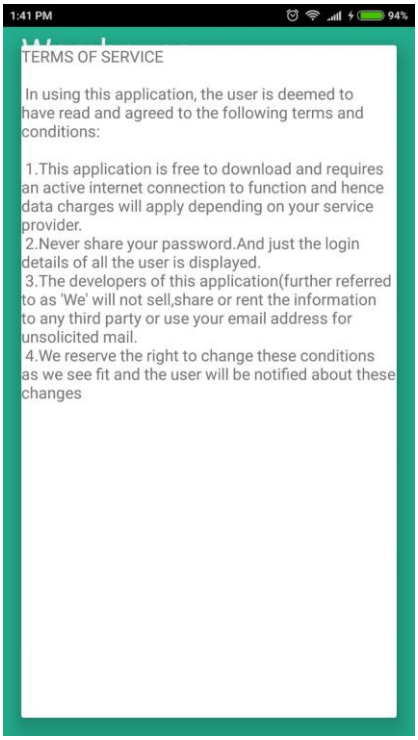
ABOUT

This opens an Alert Dialog Box and gives information of the app.



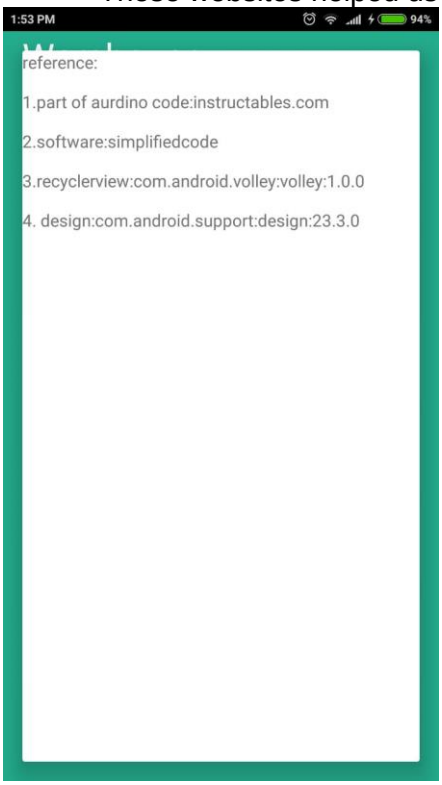
TERMS OF SERVICE

It is a disclaimer of our app.



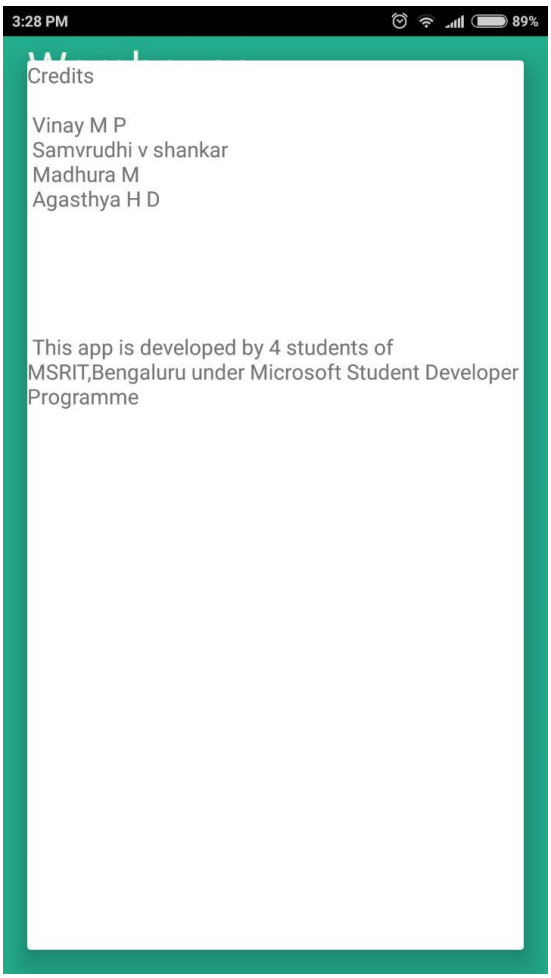
OPEN SOURCE LIBRARIES

These websites helped us build our app



DEVELOPERS

This pops up an Alert Dialog Box. It shows the names of Android Developers who worked on this project/ application under Microsoft Student Developer Programme.



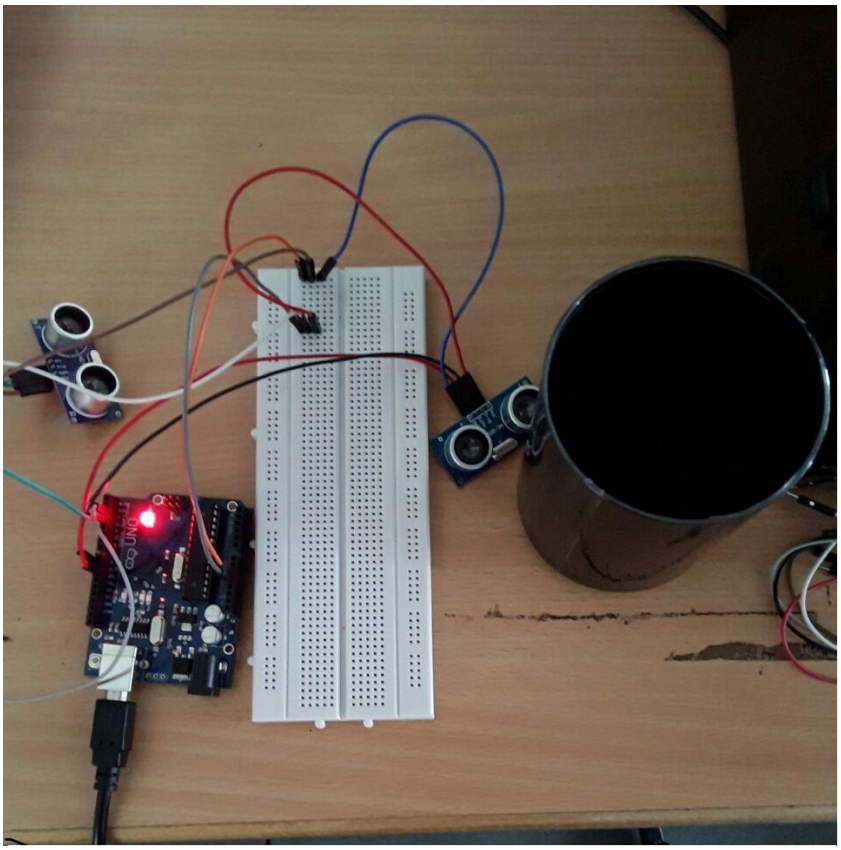
DEPLOYMENT

This application can be used when the warehouses are organized and well maintained. It also prefers the container size of all the stocks in the warehouse to be same. The size of the container can be set in the source code with technical help. Depending on the requirements he/she can change the size of the container. The app and the database which stores sensed data should be on the same local network. Depending on the item to be stored different compatible sensors are to be used.

HARDWARE

This summarizes all the hardware components used. They are

- 2 Ultrasonic Sensors.
- Arduino Uno Board.
- Bread Board for connecting 2 sensors and act as shock resistors.
- Container.



SUMMARY

From the pages above, we can easily understand the working of the application. The best way to understand this application is to practically use it. This application can be applied on a global scale. Anyone anywhere in the world who has an internet connection and are in need to manage the warehouse easily can use this simplified app.