

# Intellectual Signage: A New Method of Data Capture

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**Abstract** - Digital signage concept is replacing the traditional methods of disseminating information to the consumers while they are on the move. Dynamic displays are more attractive to the customers than static displays. Secondly mobile apps are reigning over the smartphone world nowadays. These two concepts are integrated together in this technology. It allows quick access to any content that is currently seen on the display screen. The main advantages of this system are a quick response and a simple interactive modality to capture the content from the digital display screen. Server software displays images and associated data periodically onto a display device. User can drag the current image on to his mobile. A Wi-Fi connection is needed for data transfer. An orientation sensor in the mobile detects the dragging motion. The contents dragged onto the mobile may be stored.

**Key Words:** Dragging, Orientation, smartphone, wireless, server, android app, accelerometer

## 1. INTRODUCTION

Traditionally, static sign boards were used to display information in public places. Digital displays are extensively used nowadays. This is called Digital Out-of-Home (DOOH) advertising. They are tactically placed, networked digital signage displays which attract the attention of on-the-go consumers while they are outside their home with extremely directed messages.

Recent technical developments in smartphone, wireless communication, and digital display make it possible to design new interactive signage systems. Also linking of the virtual digital content with the physical digital display is possible.

“Intellectual Signage: A new method of data capture” is presented here. The data is depicted on the screen through a server software. It displays many images periodically. This data is synchronized with the smartphones. It allows multiple users to obtain information on their smartphones from one display screen with a ‘dragging’ hand gesture [1]. A wireless connectivity is provided by a wireless router. The very less response time and a very quick method of capturing data are the credits highlighted here.

## 2. METHODOLOGY

It requires a computer with server software installed in it. An android smartphone with the signage app installed is

needed. The app is written in java using android studio. These two devices are connected wirelessly using a wireless router.

### 2.1 Server Program

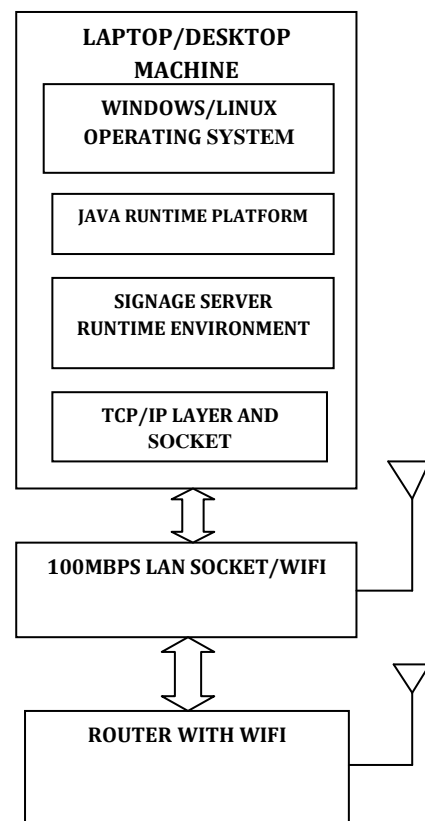


Fig -1: Server linking with router

The server software is written using Java platform. It can execute on Linux or Windows operating systems. Server links with the client (smartphone) through a port. Server changes the images periodically. When data request is got from client, the server encodes image and text and then transmitted by TCP/IP protocol. A wireless connection is used between smartphone and server for data communication.

### 2.2 Smart phone and dragging gesture recognition

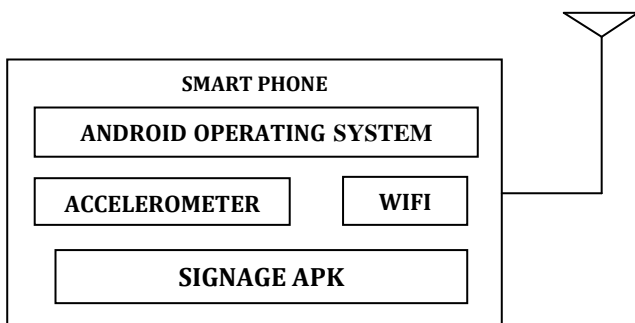


Fig -2: Smart phone and dragging recognition

A smartphone with android OS has to be installed with the .apk file of the signage app. Server and phone are connected by Wi-Fi and communicates by setting the IP address of the server system in the mobile. By user's dragging action, the image on the computer can be captured on to the phone. The accelerometer detects the movement of the mobile in the Z axis and thereby recognizes the dragging action. The received data is decoded and shown on the mobile. User can save the data in the smart phone.

### 2.3 Server Link with Port

Fig -3 shows the processing stages by which the server software initializes the port for communication, accesses the images, data and count files in the folder of the computer and finally displays the data one by one periodically. The process is represented by a flowchart.

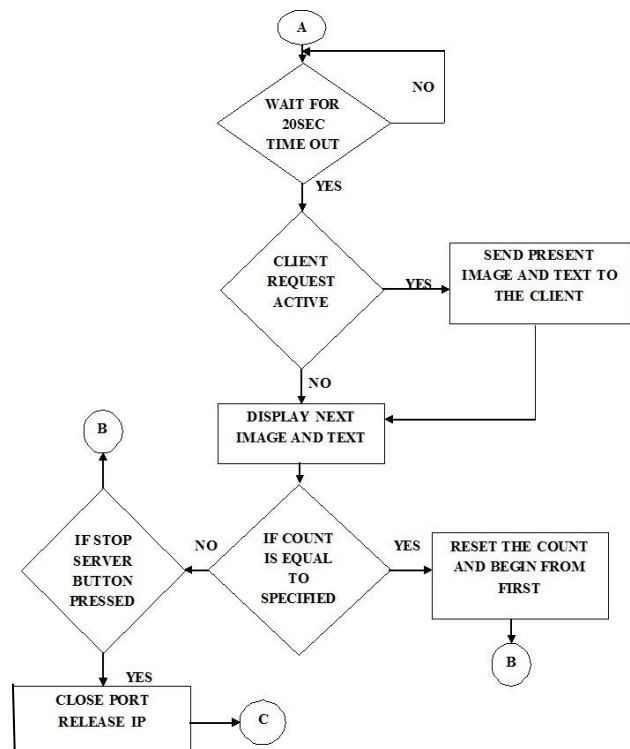
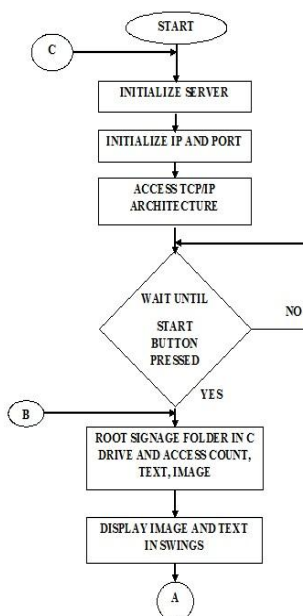
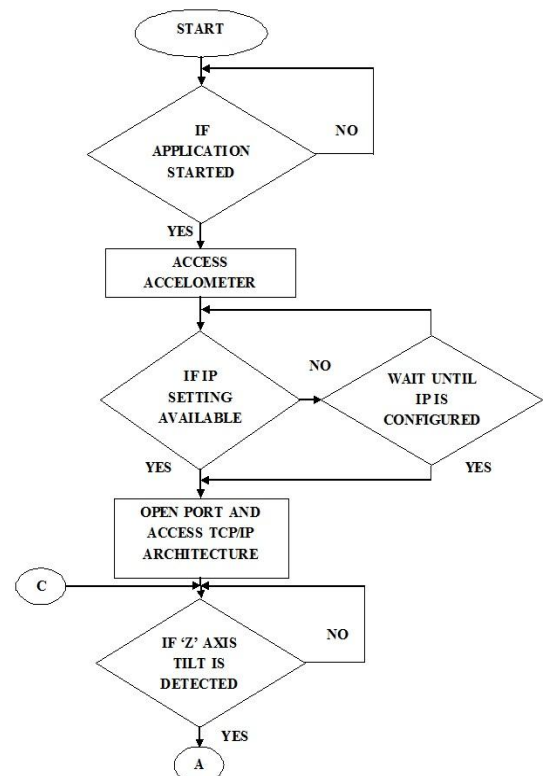


Fig -3: Flowchart of server and port linking

### 2.4: Smartphone drag recognition and processing



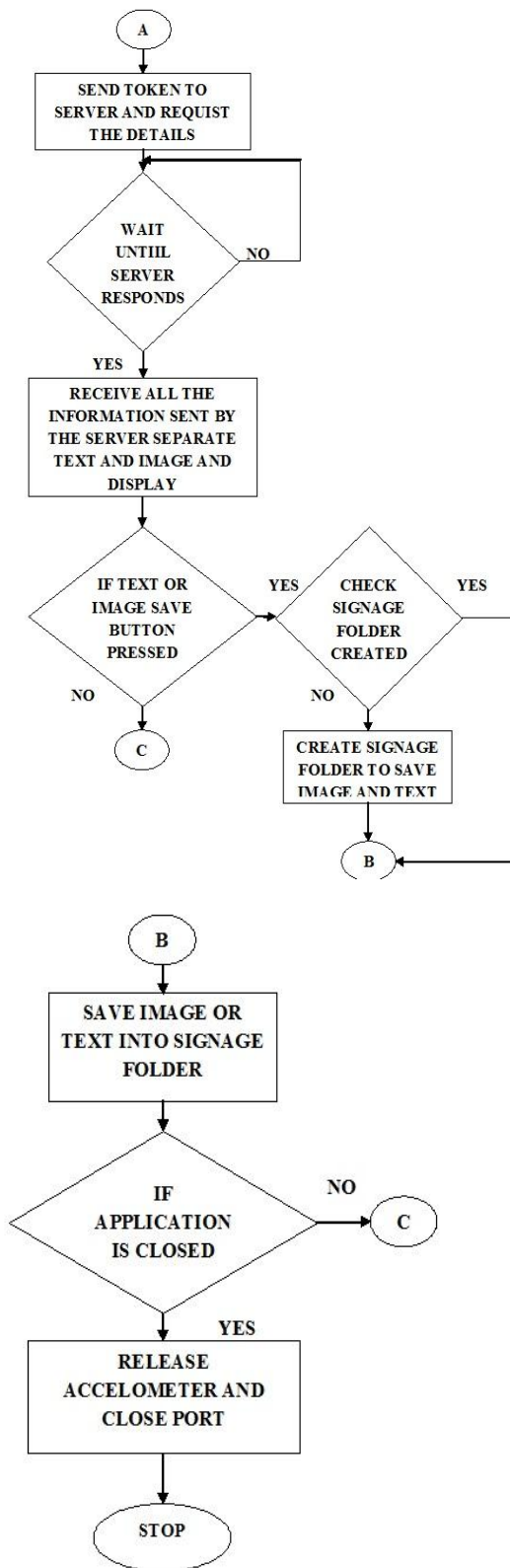


Fig-4: Flowchart showing drag recognition and processing

Fig-4 shows the process by which the android phone recognizes the dragging action and captures the data from the display screen with the help of a flowchart. The data can be saved if required.

### 3. RESULTS AND ANALYSIS

The technique discussed in the paper was implemented and tested for different real life applications.

Step 1: The server program was installed on a laptop with windows OS. Fig -5 shows the output after executing of the server application.

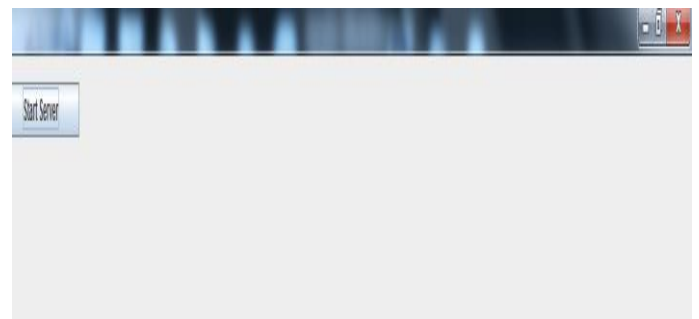


Fig-5: Output of server application execution

Step 2: The images, data, count files stored in the laptop is shown in Fig -6



Fig -6: Data stored in computer

Step 3: When the start button of server is clicked the images are displayed one at a time periodically. The first image that is displayed on the screen is shown in fig-7

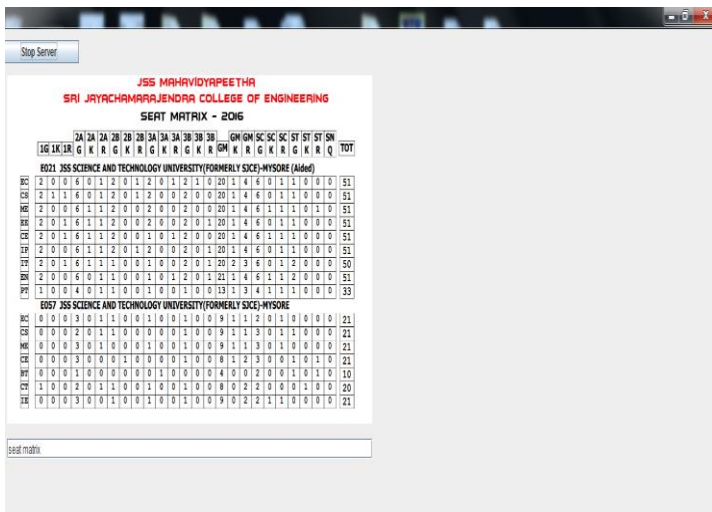


Fig-7: Images start displaying periodically

Step 4: The signage app installed on the smartphone is executed. Then the IP address setting is done by checking the server address in the laptop. The app that is executing on the mobile and the interface for setting the IP address is shown in Fig-8.

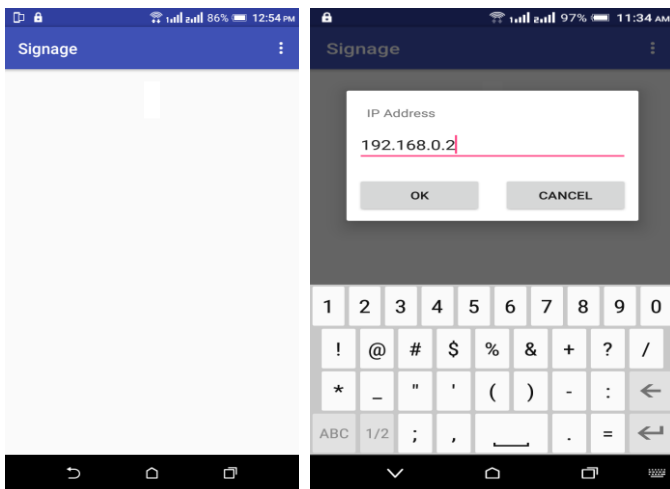


Fig-8: Signage app running and IP address set

Step 5: When the dragging action is performed, the data on the display is captured to the smartphone. The dragging action of the smartphone and the data captured on to the mobile are shown in Fig-9

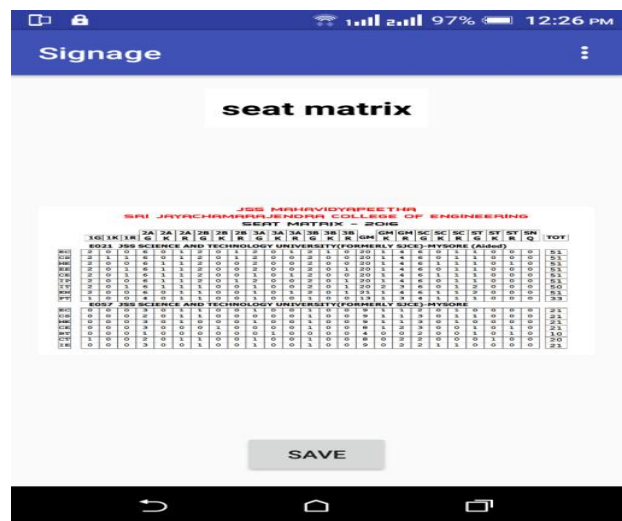
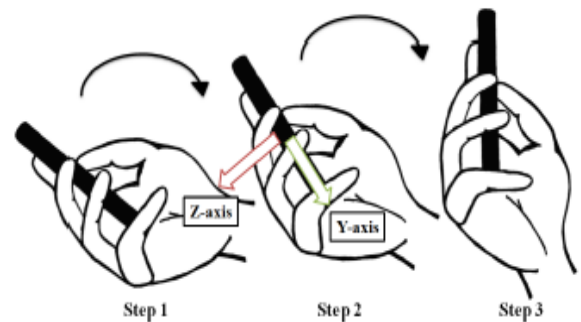


Fig-9: Dragging action and image captured on smartphone

Step 6: By clicking the save button, the image and data are stored in separate files in the internal storage of the smartphone. The files stored in memory are shown in Fig-10.

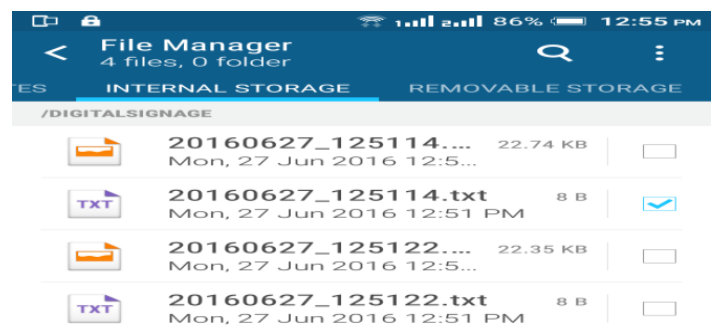


Fig-10: File created in internal memory storing images, data

The test was carried out successfully from many android smartphones having different OS versions installed. Also many smartphones were used simultaneously to capture data from a single display screen. The dragging action was successfully tested at different distances up to 20 feet from the computer.

#### **4. CONCLUSIONS**

The paper 'Intellectual signage: A new method of data capture' depicts an easy method to capture and store data from a digital display to a smartphone. It supports one-to-many interaction by a dragging action of the mobile phones. A Wi-Fi path is set up from the display device to the smartphone. It has varied applications like product advertisements in malls, train arrival-departure and other details in railway stations, time tables and other academic information in colleges etc. The distance range from which data can be captured is wide. The quality of the captured data is not affected. The response time is negligible.

#### **REFERENCES**

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