

# Embedded System for Dynamic Location-Based Advertisement using Google Maps API

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## ABSTRACT

Today, a massive quantity of revenue is generated using Advertisement-Based systems. Our goal is to maximise the potency of those advertisement systems. This can be achieved by creating the ad-system vary in keeping with the present location of the vehicle. This ensures we capture the eye of the audience in a far better way by providing them the advertisements associated with their current location. This provides a way higher personal expertise to the audience. Such a system is created employing a Embedded Microcontroller or SOC like the "Orange Pi" to stay the assembly price to a minimum with the essential modules like GSM/GPRS/GPS module and show Support. The location services is handle exploitation the Google Maps API. Introduction Right from the commercial revolution, advertising has contend a major role in promoting non-public and public businesses. Advertising may be a type of promoting communication that's used to make individuals tuned in to an exact product or entity.

**Keywords:** GSM, GPRS, GPS, Microcontroller,

## I. INTRODUCTION

Right from the economic revolution, advertising has compete a major role in promoting non-public and public businesses. Advertising could be a kind of selling communication that's used to make individuals awake to a precise product or entity. In 21 century, promotion has become omnipresent however with the same ancient rudimentary ways that and techniques. Due to these age previous techniques, most potential of

promotion is not being achieved. Our project could be a part of the good town concept that means the advertisement techniques used area unit Digital and advanced. Thus, our project can overcome problems like wastage of Physical Space, Reusability and Maintenance. Our projected project consists of "Orange Pi" at its core with basic modules like GSM/GPRS/GPS and a HDMI Display. Advertiser's information is keep on an offline info within the form of flash storage which may be updated manually on a regular basis. This information is within the kind of banner ads, videos or images that is displayed through a coloured LCD.

## II. LITERATURE SURVEY

A Sistla, O. Wolfson, and B. Xu, "Opportunistic data dissemination in mobile peer-to-peer networks," [1], to begin with, we contrivance a numerical model for scattering of information concerning merely worldly assets and take a look at break down the diffusion of information concerning absolutely momentaneous resources. Ideas like communicatory and nullification are connected to a mobile distributed system. The limitation of paper is it leads to packet loss, its communication module sleeping for power reservation, its restricted affiliation time between extremely mobile objects.

Matthew Sharifi, Terry Payne and Esther David. "Public show advertising supported blue-tooth device presence" [2], describes that framework is work for increased business selection for open displays. Interact with nature in non-nosy means basically supporting introduction of their proprietors to new adverts. It demonstrates that blue-tooth is appropriate method for deciding this audience. The

confinement is selection instrument isn't that abundant efficient. User profiles aren't custom-made thus it diminishes importance of substance displayed. It likewise neglected to take within the movement example of clients.

Juan-Carlos Cano, Carlos T. Calafate and Pietro Manzoni. "Building a probe image to supply pervasive services in hospitals" [3], this paper provides setting aware information and area primarily based services. System recovers info from patients in crisis and recovery wards information to clinicians. It concentrate on vitality consumption, output and request delay. It incontestable that blue-tooth offers a generally enduring output up to 10m. The impediment is it'd undermine security because the omnipresent framework assembles tons of touchy individual info so that they confront such a variety of legal, technical, moral challenges. If PC framework gets to be clearly inevitable all told part of life it powers people to attract while not assent.

S. Debroy, S. De, S. Das, A. Chakbraborty, P. K. Das and S. Paul, "MyPULSE: Mobile phone book with User Interest and placement Sensing Ensemble"[4], this paper create productivity and upgraded management over the graphical shopper interface. Its application utilizes current situating strategies. The business info contains information concerning varied business classes. The impediment of the paper is needed ease or ability as so much as traditional area. MYPULSE frameworks simply bolster pull primarily based advertising. Privacy and security problems emerge within the event of outlining the framework.

Open Street Map is an open-source various to Google Maps. Use of such ASCII text file map API might result into a profitable and rather useful for applications like advertising for retailers. A store owner in Bangladesh successfully enforced Open Street Map in his application and achieved positive results. [1]

QR codes and wireless fidelity might be used at the same time to achieve associate economical advertisement model for the purchasers as well as vendors. Associate robot application might

be developed to make it straightforward for the vendors to deploy their advertisements and also the purchasers to urge an additional customized advertisement experience. QR codes offer a further layer to the experience in an exceedingly means that the client will scan the code if he/she is fascinated by the item. Such an ad system has been well-tried to be non-intrusive and capable of capturing the customer's attention. [2]

As we all know location primarily based networking has several essential issues that require to be resolved. The problems of communication overhead and reachability got too sorted. To unravel these issues, the conception of Angle based Location advertisement (ABLA) was developed. ABLA uses angle primarily based amendment of routes and not the normal hop count primarily based that will increase the communication overhead. It's been well-tried that if we make use of ABLA, we come through lower communication overhead with a similar reachability that successively improves the performance of our location primarily based advertisement by achieving low overhead and higher trade-off. [3]

The problems of inaccurate locations and knowledge in highly urban areas thanks to inconvenience of line of sight measurement units is resolved. Since our project principally deals with extremely urban areas this can be a crucial issue to consider. We will create use of any current mobile devices instead of further hardware or shopper aspect code. We can make use of Bluetooth technology in these devices to calculate the correct locations. As we all know Bluetooth Technology is highly correct and offered everywhere this method is easily enforced. [4]

### III. CONSTRAINT

As this method makes use of the Raspberry Pi three because the central controller and a Sim808 module it's some constraints that create a problem. Being a mobile system it faces the

same old constraints of any mobile system. They are:

- *Low process Power:*

Although the Raspberry Pi is supplied with a 1.2 GHz 64 bit quad core processor. It still has severe bottleneck while capital punishment day to day tasks. On paper the processor may appear powerful, however in point of fact is it ineffective to operate as per expectations. Boot up takes around twenty seconds, that being fast, for activity any traditional operation you continue to have to stay up for around five seconds before the system responds. This is often noticeable throughout the primary boot up of the system and therefore the launching of our application. This constraint weighed in once we tried to play videos on the metallic element Browser put in natively on the RPi. Even basic HD video file playback was considerably choppy on the browser's native HTML5 player.

- *Low System Memory:*

This is one in every of the largest constraint of the Raspberry Pi. It solely has 1GB of system memory. At first the planned system was speculated to run on the RPi's native net browser. When tomfoolery with it for a moment, we came to a conclusion that the system simply wasn't capable of enjoying HD videos from the browser's HTML5 video player. As this is often a poster System that plays advertisements one when another with none delay, the RPi couldn't continue with the dynamical video files. The browser's allotted page memory would run out far before it may play all the videos. This effectively crashed the browser and it might outright refuse to play any more videos.

- *Low Storage Space:*

The Raspberry Pi is running on a 16GB flash storage device, out of that solely 15GB is usable. This limits the capabilities of the system to a good extent for future use. Currently the system OS that is Raspbian Jessie with Pixel needs 4GB of disc space alone and another 1GB of disc space is allotted to Page Memory. The support libraries for the project leave a footprint

of about 200MB. This leaves USA with the house of approximately 9GB. Assuming every video file to be of 10MB, and their shorter version being 2MB we will store regarding 700 advertisements before running out of disc space. Alongside this, we have a tendency to face a risk of facing major system performance problems thanks to low disc space. Although, deploying in little region would create no threat for this method, however at a broader sense it's problematic.

- *Low System Bandwidth:*

The Raspberry Pi is connected to a network module running on the SIM808 chip. This chip though being a great beat one package for each GPS and GSM connectivity, it's severely bottlenecked thanks to the limitations of the GSM network. The GPS module on the other hand is nice and provides an accuracy of -165 dBm which is quite enough for our application. The GSM module being restricted to the 2g network bottlenecks the upload section of the system. Even AN operation of easy Geocoding needs 3-4 seconds because it is restricted to the 2g GPRS speeds of 56Kbps at its worst and is basically unstable. Thus remote update for the system is close to not possible by using the sim808 2G module because it would take an oversized amount of your time to transfer any publicity files.

#### IV. SYSTEM MODULE

This planned framework incorporates microcontroller, show, GPS modem, GSM modem, Bluetooth, drove strip and signal. We can settle this whole framework on personal or open vehicle. Microcontroller can get scope and line of longitude from GPS and according to numerous space zones distinctive commercials can show in plain read unit. At the purpose once business are going to be shown on notice framework, consumer gets the affirmation by short message profit. Ads can amendment because the space territory changes through numerous target places. Here drove strip and signal is employed to urge people thought towards the notice framework. Vehicle driver is given humanoid application with secret key

assurance; if there ought to arise an event of crisis he will show any crisis commercial on this framework utilizing humanoid application and Bluetooth module.

### GPS Module

This is one amongst the key elements of the system. It is required forgetting this Geo-Location of the vehicle wherever the system is put in. Thus, it's attainable to map the close advertisements. GPS module ought to have basic support for receiving Latitude, line of longitude and Course on Road measurement External Device like Laptop/Mobile phone: An External Device is required for the upload/update section of the system. The advertisements are supposed to be uploaded to the system via the net consumer of the external device. Conjointly the external device is accustomed directly access the advertising system on the devices native browser.

### Google Maps API:

Google maps API is accountable for all the mapping of the geographic co-ordinates to the particular location. This is often done through a method called Reverse Geocoding. It receives co-ordinates from the system and transfers it over to Google Maps that then provides the system with the suitable mapped locations.

### Radial Mapping

The advert slots of a specific are filled with advertisements or not. Every explicit space includes a maximum range of advertisements slots. This determines the most range of advertisements that may be allotted and contend in this explicit area. The radial mapping is employed to once the administrator needs to feature a commercial within the system. once the administrator enters a selected location, then the radialmapping.py is liable for checking if there are promotional material slots offered or not. If there are slots offered then this module adds the promotional material to the info and therefore the system therefore making the system dynamic and exhible. The radial mapping checks every and each promotional material if it lies within the show radius of the system. If a

selected advertisement lies within the current show radius, then it checks the promotional material slot property and if the present range of advertisement slots is a smaller amount than the most range advertisement slots then it'll add the promotional material to the system. With the employment of this module, the system is able to manage and management the amount of advertisements which may cause any sudden working of the system or perhaps its failure. This module makes positive that the system in not overladen with advertisements that the system are going to be unable to play and informs the administrator if the system is already full.

### Web interface

The web application is that the side of the system that the administrator will read and management over. Through Java, JavaScript, HTML, CSS, Ajax and different technologies, application specific strategies like drawing on the screen, enjoying audio, and access to the keyboard and mouse are all potential. The present system makes use of the on top of mentioned technologies to make an online application that's fast, responsive and lightweight so the UI is interactive, enticing and efficient. Several services have worked to mix all of these into an lot of acquainted interface that adopts the appearance of associate degree software package. General purpose techniques like drag and drop are supported by these technologies. System will used Ajax, an online development technique employing a combination of assorted technologies, is an example of technology that creates a lot of interactive expertise

## V. CONCLUSION

Based on recent statistics and surveys our inclination towards a lot of good and digitalized society makes this project splendid and viable among successive 5-10 years. The requirement for a stronger and economical ad system is ever growing and thence the normal ways will become obsolete eventually. A location

primarily based advertising system for industrial areas like malls, looking centres etc. that have preinstalled Wi-Fi systems put in. This system provides a price effective and economical method to advertise in large looking areas.

## REFERENCES

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