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Location Based Marketing Using Smart Geo Fencing

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ABSTRACT: The Use Of Location Based Services Has Been Increased Largely, Due To The Growth Of Connected Devices In Recent Times.Location Based Marketing Helps Marketing Teams And Retailers Reach Their Target Audience, Purely Based On Proximity (Nearness). Location-Based Marketing Is The Next Big Thing In Mobile Marketing. Location Based Marketing Has Been Taken To The Next Level With The Help Of New Technology Called Geofencing. Geofencing Is A Location Based Service Using Which Marketers Can Promote Their Sales By Advertising Their Products And Services To The Target Audience (Customers), Whoever Passes Nearby Their Retail Store Or A Particulartarget Location. Geofencing Uses The Global Positioning System (GPS) Or Radio Frequency Identification (RFID) To Create A Virtual Boundary. Both Of These Technologies Are By Default Available In Mobile Phones.In This Paper, We Are Attempting To Solve The Problem Of Local Retailers In Reaching Their Target Audience At Right Time And Right Place By Making An End To End System For Automation Of Business Promotions Using Smart Geofencing.

Key Words: Geofence, Location Based Marketing, Innovative Marketing, Mobile marketing, Smart Geofencing.

1. INTRODUCTION

Marketing Refers To Any Actions That A Company Takes To Attract The Audience Towards The Company's Products And Services.Every Business Or Company Needs To Market Their Products And Services In Order To Sell Them To Their Customers. Marketing Is A Very Important Part Of Business As It Helps Companies To Showcase Their Products And Services To Their Target Audience And There By Converting The Audience Into Potential Customers. One More Important Aspect Of Marketing Is That It Mainly Helps In Selling The Products And Services To The Customers And There By Generating Revenue To The Company. Marketing Campaigns Helps Businesses To Understand Their Customers Better. The Businesses Will Get To Know The Best Ways To Approach Their Customers Through Marketing Campaigns. In Most

Of The Cases Marketing Helps Businesses To Build And Maintain Healthy Relationships With Customers There By Increasing The Customer Loyalty.

In Simple Words, A Geofence Can Be Defined As A Virtual Boundary Around A Real-World Geographic Area. Whereas, Geofencing Is A Location Based Service In Which A Software Or An Application Uses Global Positioning System (GPS) Or Radio Frequency Identification (RFID) To Trigger A Pre-Programmed Action Whenever A Mobile Device Enters Or Exits The Virtual Boundary Which Was Set Up Around An Area With Certain Geographic Radius. Based On Our Requirement We Can Choose The Per-Programmed Action. The Pre-Programmed Action Can Be Either A Text Message Or A Push Notification About The Best Deals And Offers Available At Our Retail Store. The Radius Of The Geofence Is Variable And Flexible. A Geofence Need Not Always Be In A Circular Shape, The Shape Of Geofence Can Also Be A Polygon. The Area That A Geofence Can Cover Can Be As Small As 50 Meters To As Large As An Entire City.

In This Paper We Mainly Focus On Helping The Small Businesses And Local Retailers Who Cannot Afford The Costly Marketing Techniques. The Local Retailers Are The Ones, Whose Market Is Very Small And Depends Mostly On Local Customers near Them. The Retailing Industry In India Was Essentially Owner Manned Small Shops. There Are Plenty Of Opportunities If You Are Creative And Marketing Through

Geofencing Is One Such Technique. Through This Project The Retailer Will Be Able To Set Up Geofences At Any Specific Place Around His Retail Store And Can Send A Push Notification About The Special Offers Available At Our Store Whenever The Target Audience's Mobile Device Enters And Exits The Geofence, By Doing So We Can Attract The Customers Who Are Nearby Our Store. This Technique Is Highly Effective And Cost Efficient And This Is What The Local Retailers Need.

2. RELATED WORK

Till Today Most Of The Local Retailers And Companies Are Still Using The General Advertising Techniques Like Television Ads, Radio Ads, Billboards, Hoardings, Banners And Pamphlets. Only A Very Few Companies Are Using Digital Marketing Techniques Like Social Media Ads Including Facebook Ads, Instagram Ads, Youtube Ads And Promotional E-Mails. All The Above Mentioned Advertising Techniques Lack In The Relevance To The Customer. Some Techniques Might Consider Previous Purchase History, But No Technique Considers The Current Location Of The Customer, Which Can Play An Important Role In Attracting The Customer And Can Make The Customer To Visit Our Nearby Retail Store.

Television Ads Are Very Expensive and Take A Lot Of Effort To Make. Television Ads Are Very Short And Always They Cannot Convey All The Details About The Product Or The Service In The Best Way. Pamphlets And Banners Are Not Eco-Friendly To Environment

And Are Injurious To Human Health. Most Of The Promotional E-Mails Are Automatically Sent To Spam Folder Without Even Viewing. Social Media Ads Lack In Relevance To The User And It Is Complex To Measure The Marketing Effort That We Put In The Digital Marketing.These Are Some Of The Disadvantages Of The Marketing Techniques Which Are Currently Used By The Local Retailers And Small Businesses.

"GPS: Which Indoor Location Technology Will Your Business Benefit From" **- Devikagirish, July-2015 [8].**

In This Paper, The Author Proposed That, When A BLE-Enabled Device Like The Modern Day Smart Phone, Comes In The Range Of A Beacon Signal, An Action Can Be Triggered In The Device. The Actions Can Either Be Relevant Text Messages Or Notifications, Provided The Device Must Enable Its 'Bluetooth' Services. Bluetooth Beacons Are The Best Option Available When It Comes To Indoor Locations. This Technology Is Flexible, Accurate And Has A Low-Cost Infrastructure.

3. PROPOSED SYSTEM

The Usage Of Smart Phones Has Been Increased With The Rapid Growth In Technology. Modern-Day Mobile Devices Can Provide Lots Of Information About The User Like Current Location, Physical State Etc…. Customer's Location Is One Of The Important Information In Today's Digital World. We Can Get The Current Location Of The Customer Using The Global Positioning System (GPS) Present

The Customer's Smart Phone. Due To The Expanding Smart Phone User's Base, Many Industries Are Showing Interest In Location Based Marketing Techniques. One Of The Main Use Cases Of Geofencing Is That, Using This Technology We Can Also Attract Out Competitors Customers By Setting Up Geofence Around His Retail Store And Displaying Our Best Offers Whenever A Customer Enter His Retail Zone. As Geofence Is Virtual, The Competitor Cannot Even Notice It.

Geofencing Is A Great Feature In Software Applications, Which Uses The Global Positioning System (GPS) Or Radio Frequency Identification (RFID) To Define A Virtual Boundary Around A Real World Geographical Location. The Geofencing Apps Continuously Monitor The Location Of The Mobile Device. Whenever The Mobile Devices Enter Or Exit An Established Geo-Fenced Area, Alerts Or Notifications Will Be Triggered. This Requires The Continuous Monitoring Of The Mobile Device Location As Well As The Continuous Matching With The Set Of Geofences. There Are Certain Limitations To Geofences; We Can Have Only 100geofences Per App, Per Device User, With Multiple Geofences Being Active At A Time.

Location Based Marketing Using Geofencing Allows Retailers And Businesses To Reach Their Target Audience At Right Place And Right Time. What Does It Mean By Advertising At Right Place And Right Time, Let Us Consider This Example "Imagine That You Are Passing Nearby A Shopping-Mall

And Suddenly You Have Got A Notification Or A Text Message On Your Mobile Device That There Is "50% Off On Some Branded Clothes" In That Mall. Now, The Probability Of You Visiting That Retail Store Becomes Much Higher When Compared To You Being At Your Home And Watching The Same Ad On TV". The Above Example Demonstrates That We Can Increase The Foot Traffic To Our Retail Store If We Effectively Use Location Based Marketing Using Smart Geofencing.

3.1 METHDOLOGY

The Main Idea Is To Divide The Total Project Into Two Apps, One App For The Retailers And The Other App For The Customers.

1) Geofence Admin – An App For Retailers To Create And Monitor Geofences.
2) Offer's Zone – An App For Anyone Who Want The Best Offers And Deals Available In Their Current Location.

Geofence Admin App

Geofence Admin App Is Mainly For Retailers, The Retailers Should First Sign-In Into The App In Order To Create And Monitor Geofences Around Their Retail Stores. Geofence Admin App Also Provides The Information About The Reach And No. Of Views Of Their Ads. Whenever A Retailer Adds A New Geofence, This Information Will Be Stored In Firebase Database And As Firebase Is A Real-Time Database, The Geofences Will Be Added In Offer's Zone App.

Offer's Zone App

Offer's Zone App Is Mainly For The Customers Or Anyone Who Want To Know The Best Deals And Offers Available. The Offer's Zone App Sends Push Notifications To User's Mobile Device Whenever The User Enters Or Exits A Geofence. This App Needs User's Location Permissions And Active Internet Connection In Order To Work Properly.
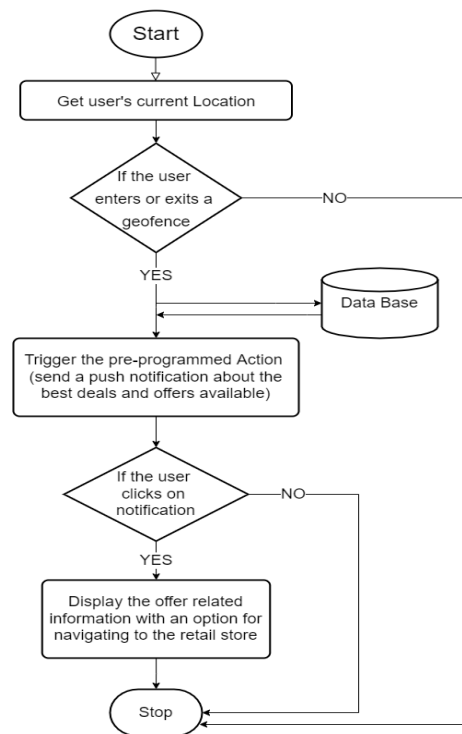
3.2 WORKFLOW OF OFFER'S ZONE APP

Fig-1 : Workflow Of Offer's Zone App

The Above Figure Demonstrates The Working Of The Customers' App Which Is Offer's Zone App. This App Continuously Monitors The Location Of The User's Mobile Device And Triggers The Push Notification Whenever The User Enters Or Exits A Geofence. If The User

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Clicks On The Notification, The User Will Be Redirected To The Offers Page Where The Details About The Offer Will Be Displayed Along With A Button To Navigate To The Retail Store In Which The Offers Are Available. The Location Of The Retail Store Will Be Opened In Google Maps Where We Can Also Get The Directions To The Store.

4. RESULTS AND DISCUSSIONS
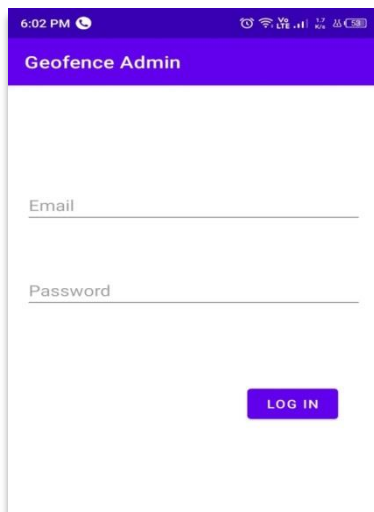
1. This Is The Login Page For Geofence Admin App. The Retailers Should Login To The App Inorder To Create And Moniter Geofences.


2. After The Sign-In, The Reach And Views Count Of The Retailer Will Be Displayed. Reach Represents The No Of Users Entered And Exited The Geofence And The Views Represents The No Of People Who Have Clicked On The Notification And Viewed The Offer Details.
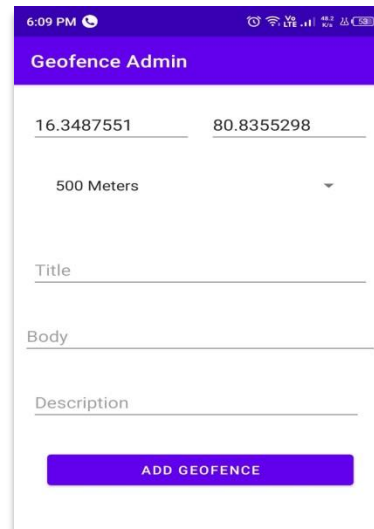
3.This Page Will Be Displayed When The Retailer Clicks On "ADD GEOFENCE" Button.
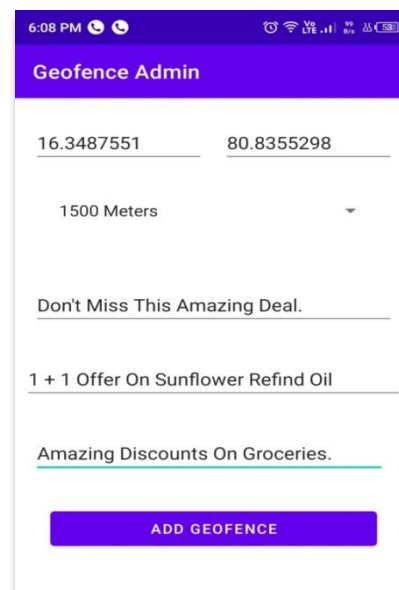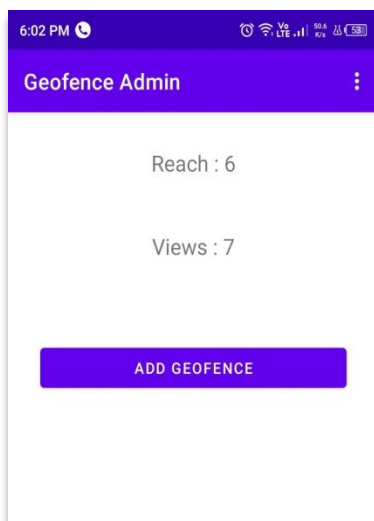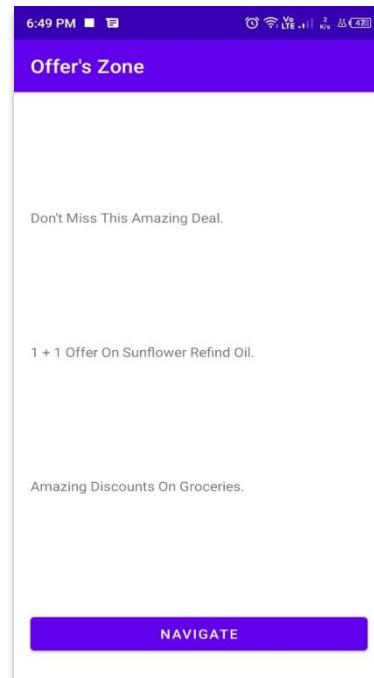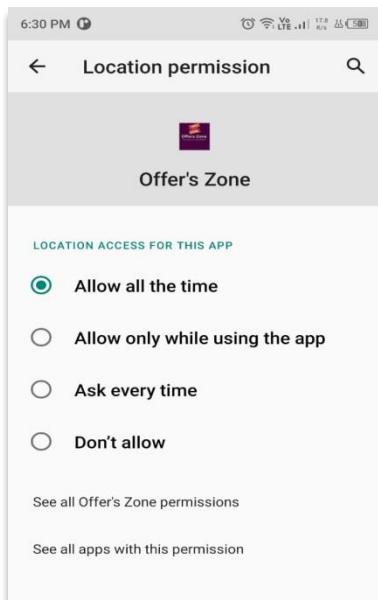

4. After Filling All The Required Information, Click On The "ADD GEOFENCE" Button To Add The

Geofence. When The Button Is Clicked, All The Data Will Be Stored In The Firebase Database.
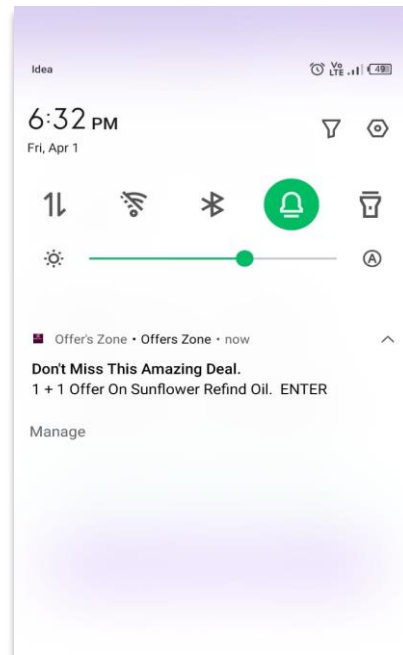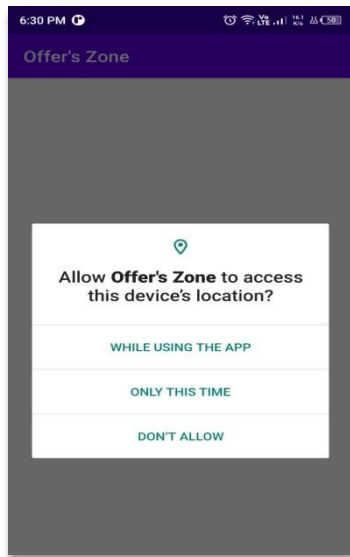

5. This Is Offer's Zone App, Inorder To Work Properly This App Needs Some Permissions From User Like Location And Active Internet Connection.

6. Offer's Zone App Need Background Location Access And GPS To Be Enabled Always.

7. Whenever The User Enters Or Exits The Geofence, A Push Notification Will Be Triggered. The Notification Will Have All The Offer Related Details.

8. If The User Clicks On The Notification He Will Be Redirected To The Offer Details Page With The Option To Locate The Retail Store In The Offer Is Available.
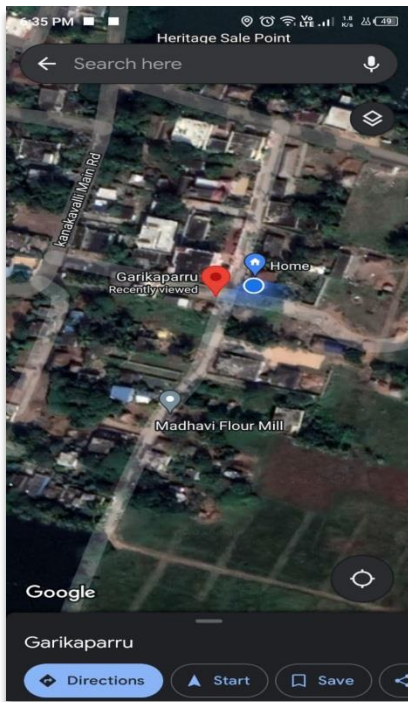
9. If The User Clicks On "NAVIGATE" Button, The User Will Be Redirected To Google Maps Pointing To The Retail Store In Which The Offer Is Available.

CONCLUSION & FUTURE WORK

In This Paper We Have Tried To Make An End To End System That Can Automate The Sales Promotions And Help Local Retails In Reaching Their Target Audience At Right Place And Right Time. It Is Very Clear That Geofence Is A Powerful Tool And If You Can Use It Correctly, It Can Increase The Foot Traffic To Our Retail Store There By Increasing The Sales And Generating More Revenue. Though This Project Is An End To End System, It Can Be Extended Further By Adding User Profilesto Offer's Zone App I.E. Registering Every Customer And Tracking Their Interests In Products And Services And Showing Them The Offers Based On Their Purchase History. We Can Also Add

Payments Feature In The Offer's Zone App. We Can Also Add Search Feature, Search By Item Name, Search By Location Name And Search By Retail Store Name.

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