A Project Report

on

Location Based Mobile Advertisement

Submitted in partial fulfillment of the
requirement for the award of the degree of

Bachelors of Computer Applications

GALGOTIAS UNIVERSITY

(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

Under The Supervision of

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OCT, 2023

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CANDIDATE'S DECLARATION

We hereby certify that the work which is being presented in the project, entitled **"Location Based Mobile Advertisement"** in partial fulfillment of the requirements for the award of the BCA in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of 2023-2024, under the supervision of Ms. Pragati Gupta… Assistant Professor, Department of Computer Science and Engineering of School of Computing Science and Engineering, Galgotias University, Greater Noida

The matter presented in the thesis/project/dissertation has not been submitted by me/us for the award of any other degree of this or any other places.

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Ms. Pragati Gupta

Assistant Professor

CERTIFICATE

The Final Project Viva-Voce examination of has been held on 18/10/2023 and their work is recommended for the award of Bachelors of Computer Application.

Signature of Examiner   **Signature of Supervisor(s)**

Signature of Program Chair   **Signature of Dean**

Date: 18th Nov 2023

Place: Greater Noida

Abstract

Location-based advertising has emerged as a powerful tool for businesses to connect with their target audiences, offering the potential for highly targeted and relevant marketing. However, a persistent challenge in this domain is the low conversion rates associated with such advertising campaigns. This abstract outline the issue of low conversion rates in location-based advertising and introduces a novel strategy for improvement – the use of a reward system.

The tools and technologies involved in the Location-Based Mobile Advertisement project encompass:

- Client
- Servers
- SQLite Database
- Cache

Internal experiments have revealed that the content of the advertisements maintains a high level of accuracy and correctness. Nevertheless, the localization feature still requires refinement. Surveys and interviews have affirmed the effectiveness of the real-time, location-based advertising model within the project. This model is user-friendly and exhibits a short response time, based on feedback from users. Furthermore, customers have expressed a strong liking for the prototype's functions, and small business managers have validated the reasonableness of the pricing structure.

This dissertation introduces a location-based advertising model designed to assist small businesses in addressing the challenges they currently encounter. Given the uncertainties of the market environment, the study of the original business concept adhered to the principles of the lean start-up methodology.

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Appendix A-Abbreviations

Short Term	Expanded Term
CPM	Cost Per Thousand impressions; advertiser pays when a user sees an advertisement
CPC	Cost Per Click; advertiser pays when a user clicks on the advertisement
CPA	Cost Per Action; advertiser pays when a user completes a specific action
CTR	Click-through Rate; number of clicks on the ad divided by the number of delivered impressions of that ad
ROI	Return on investment
LBA	Location Based Advertising
LBS	Location Based Service
IDE	Integrated Development Environment
SDK	Software Development Kit
ADT	Android Development Tools
MVC	Model-View-Controller
REST	Representational State Transfer
HTTP	Hypertext Transfer Protocol
DIY	Do It Yourself

Chapter 1 Introduction

1.1 Background

"Advertising has played a major role in business to consumer marketing, and enabled sellers to meet communication and other marketing objectives". In the current world of commerce, advertising is a significant way that sellers could take to increase their market and popularize their products. With the development of the business, sellers' demands for advertising is becoming more and more complex while the number of advertising models is also increasing.

Huge variety of advertising models bring multiple choices to sellers but also increase the competition. Many sellers, especially the owners of small businesses, feel hard to get benefit from those types of advertising. This means, it is hard for them to get prospective customer engagement even if they spend a great deal of time, resource and money on advertising. Almost every person has own smart phone these days due to the rapid advance of the science and technology. In this case, now it is possible to offer advertisements everywhere and this will break the geographical limits.

At the same time, *location-based advertising (LBA)* is also helpful for sellers to target not a new concept but it can be applied in various advertising models with different methods. In this dissertation, the model of LBA also based real-time will utilize the LBS (location-based service) and deliver the targeted advertising initiatives from an identified seller "that is specific to the location of consumers" to consumers' mobile

1.2.Reward System

A customer reward program is the best strategy to convert your new customers to repeat customers. By offering different discounts and incentives you can grab your customer which leads to involvement and growth of your business.

Point-based system

This is a kind of reward program that lets customers collect points that can be redeemed on various products. Many e-commerce businesses struggling to get customers in the effective door might find a solution in this loyalty program. There are so many ways the customer can earn such points. For example – grievance compensation, social sharing, emails, or any other actions you take to drive traffic to your site. Our website also contains this reward system in which we will provide reward to our customers as points which they can claim later on.

It will help the customer to get more available offers in Reward Markting.

1.Build connections

2.Increase customer loyalty

3. Deepen engagement and

4.Attract new customers

1.3. Research objectives

According to the research question, objectives of the dissertation are:

1. Analyze existing advertising models and propose a set of features that address the needs of small business owners.

2. Implement the project which employs the real-time and location-based advertising model.

3. Evaluate if the real-time and location-based advertising model works well in

4. Provide evidence that if the real-time and location-based advertising model could help to increase advertising effectiveness and save money.

1.4 Dissertation outlines

This dissertation is organized as follows:

● Chapter 1 constitutes an introduction to the research and outlined the motivation, research question and objectives of it.

● Chapter 2 explores the state of the art in current existing advertising models.

● Chapter 3 introduces the development of the idea and as well as the design of the advertising model prototype.

● Chapter 4 discusses the technologies used to implement the model prototype and describes its key features.

● Chapter 5 details the evaluation process and results of these studies.

Chapter 2 State Of Art

This chapter is to outline and review the current existing advertising models and make a comparison among these models in the last section of this chapter. Besides, the concept of location-based advertising is also explained in this chapter.

2.1. Concept and history of advertising

People are "exposed to hundreds and maybe even thousands of commercial messages every day", these messages usually occur in the form of newspapers, flyers, billboards, web sites, television or emails. In this condition, these communication tools may simply be seen as "*advertising*". However, these tools are the medium pf marketing communications, and advertising is only one type of "marketing communication".

From different aspects, *advertising* could be defined as different meanings. In this dissertation, from the functional perspective, *advertising*'s definition is "the structured and composed non-personal communication" about an organization, product, service or idea, which usually paid by "identified sponsors" through "a mass communication channel". It helps to inform and persuade consumers and then helps advertisers to achieve their marketing goals.

2.2. Traditional advertising

The traditional advertising is still a general model for advertising. Almost everyone could usually see various advertisements belong to this kind of advertising model in daily life. As mentioned, traditional advertising is "messages or commercials communicated through historically established media such as television, radio, outdoor (billboards), print, and direct mail". Standing from current advertising market's point of view, traditional advertising usually represents advertising through television, radio, poster,

flyer, magazine and some other media. The following paragraphs discuss and compare some different traditional advertising methods and the advantages or disadvantages of magazines or flyers. Billboard usually takes the largest forms and are very conspicuous. Most of the billboards are placed near the main roads and these advertisements must be short. Newspaper maybe one of the oldest advertising methods. In most cases, daily new edition "makes it also the most disposable type of advertising". Compared with newspapers, magazines are more long-term. Additionally, magazines are more "typically passed off to others", so the chance of the advertisements on magazine will be seen is higher. Flyers, also called leaflets, is a form of paper advertisement. They are inexpensive to produce. Author of described that "leaflet distribution is estimated at producing over £12, 000, 0000 worth of business in the UK each week." That amount was only estimated through surveying large corporations. So, if take all businesses (include the small and medium corporations) that "use leaflet delivery campaigns as part of their marketing" in to account, the actual figure is likely to be much higher. This kind of advertising usually charge through three ways: cost per impression "(payment for every website visitor who sees the advertisement)", cost per click "(payment for every website visitor who clicks on the ad and visits the advertiser's website)", or cost per action ("payment for every website visitor who clicks on the advertisement, and then goes to the advertiser's website and completes a task" such as filling out a form or making a purchase directly) . In fact, these three methods are the main ways to pricing the web advertising and they even are the usual methods for pricing most online advertising.

2.4. Location Based Advertisement System

The opportunity for advertisers to utilize LBA increases tremendously in recent years. It plays a vital role in many sellers' marketing campaigns and there are plenty of ways to use this method. Through a lot of successful examples of the practice of LBA, it has be proven to be an effective and successful strategy.

There are two approaches of LBA: the "push" approach and the "pull" approach". These two concepts are familiar in the context of "traditional marketing communications", but they are defined differently with regard to "location based advertising". Within the "push" method, advertisers may take some actions to push their advertisements to the user side and then consumers could choose to see it or quit. For example, the push approach may be used when users walk near a restaurant at lunch time and receive text messages from the restaurant which letting them know the menu of the lunch for this restaurant or a special meal today. But within the "pull" method, users are seeking the information they need rather than "the information seeking them". For instance, a tourist wants to know where the nearest restaurant with cheap price is, so he is eager to find some related information in order to choose one restaurant from the seeking results. In other words, the pull approach means that "the user chooses the time and place to access the information"

Chapter 3 Implementation

3.1. Chosen technologies

3.1.1. Client

In order to implement location-based model in a website , using the Android Software Development Kit is necessary. In this project, the plug-in Android Developer Tools (ADT) for creating Android project in Eclipse need to be installed. With regard to Android Software Development Kit (SDK), it is established for particular software packages (such as software framework, hardware platform, and operating system) by software engineers.

In addition to the basic technologies used in the website , this
 project also made heavy use of the MVC (Model-View-Controller) pattern. According to MVC pattern is explained as:

The MVC architecture enables data to be presented in different ways throughout the system. In this project, the MVC pattern was implemented by using JSON Objects to represent the models used in the application. These models were used by controllers when displaying information back to the user. Activities were used as controllers to retrieve user input, handle all events, request web services, process data and call XML format views to show in front of application users.

3.2 Server

The main server of the project is based on the REST architecture and the Jersey frame. "REST is an architecture style for designing networked applications" . It is a lightweight development style, it can reduce development complexity and also improve the system scalability. Rather than "using complex mechanisms such as CORBA, RPC or SOAP to connect between machines", REST uses simple HTTP to make calls. Rest is an

3.3 Cache

Another one data store approach used in the project was A Simple Cache. It is a lightweight open-source caching framework developed for Android. It may only have one java file (streamline from more than a dozen classes). A Simple Cache can be used to cache various Android objects include ordinary string, JSON objects, serialized java objects, byte array and so on. In website development, A Simple Cache could be used to replace Shared Preferences profile, especially when the application needs to read data from the Internet. This is because A Simple Cache could cache the requested data, and then the application can re-read data while the cache data is out of data.

Chapter 4 Evaluation

4.1. Evaluation process

The complete evaluation process of the project consists of three parts: Internal performance test, questionnaires, and interviews.

The internal performance test focuses on the performance of the advertising model implemented in the android application. Two experiments were conducted to test the advertising function in the application.

Questionnaire surveys were conducted after the internal test. Two separates questionnaires (can be seen in Appendix B and C) were targeted to consumers and managers of small businesses. The purpose of the questionnaire surveys is to discover customers' concerns, interests and their attitudes to this model.

With regard to the interviews, all interviews took place after that the participants tried the application and be willing to attend the survey.
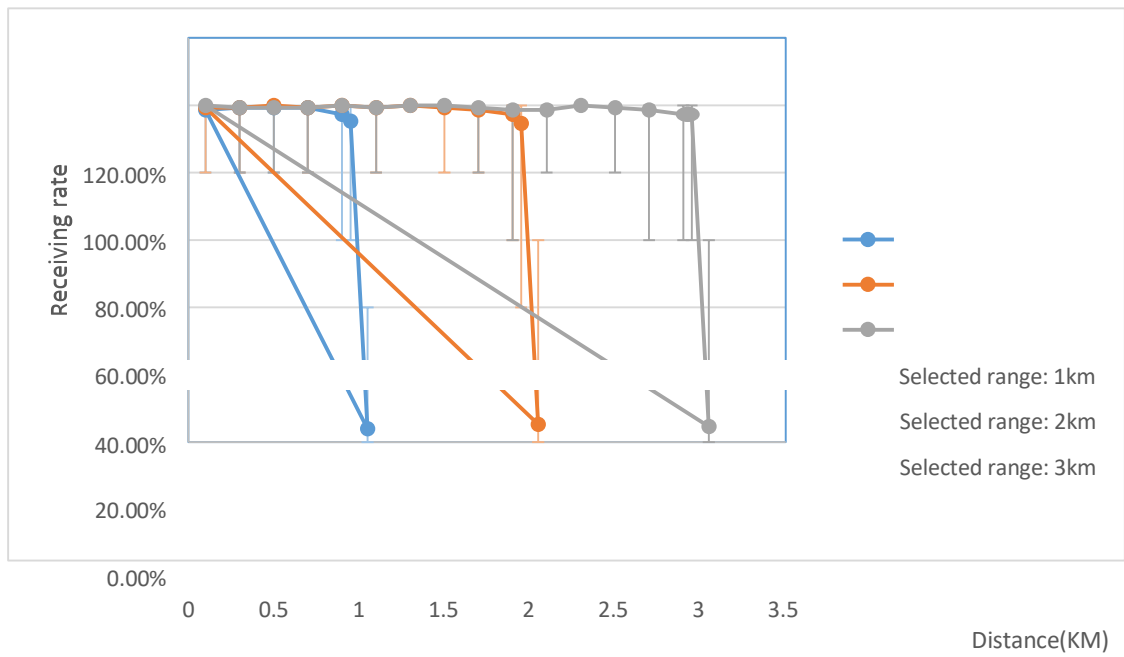
Figure 22 Receiving rate of advertisements

Aside from some small localization errors, in most cases, the locating function of the model works well in the project. This function enables consumers within suitable range to get all available advertisements and sometimes may get more advertisements.

Chapter 5 Conclusion and future work

This chapter describes the main conclusions of this project and outlines further ideas that can be accomplished as future work.

5.1. Conclusions

This dissertation proposed a location-based advertising model which aims to help small businesses mitigate the problems they currently face with. Due to the uncertain market environment, the studies of the original business idea followed the lean start-up methodology.

Preliminary research on the current existing advertising models was carried out firstly in the state of art. During this period, the basic concept of location-based advertising was also introduced. The analysis and summary of the current advertising models helped to identify the problems and then put up a solution as a model. The introduction of the advertising prototype was described after the explanation of the development process of the idea. This dissertation also demonstrated the implementation of the model in the application. In order to validate the feasibility of the model applied in and explore how the users would react to this model, the three-

Through these studies and the collected feedback from customers, the main benefit of the real-time and location-based advertising model in application can be concluded as: For small businesses, the significant customers of application, this model enables targeted advertising within a specific range. This function could help to improve the hit rate of consumers because it focusses on specific areas.