

# Location-Based Analytics for Intelligent Marketing to Achieve Competitiveness in Small Business

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## ABSTRACT

The rise of the smartphone integrating the phenomenal, rapid development of the data science and the evolution of analytics (e.g., Analytics 4.0) had been one of the single largest drivers for e-commerce, constantly connecting consumers to a digital and globalized marketplace and the ability to derive predictive models from raw big data automatically [1]. Operating without restriction on trading hours and a desire to learn more about your behavior and purchase habits than thought possible, these outlets are presenting a large challenge for physical retailers. Consequently, increasing the complexity of that industry means that marketers must be experts not only in marketing methods and techniques but also in people, data, delivery platforms, context marketing and location-based analytics, and intelligent techniques for marketing using smart devices. For marketing using smart devices, the goal of location-based analytics marketing utilizing smart devices is to encourage those activities as well as drive foot traffic share discounts and build customer loyalty. Now, businesses are already populating databases with web traffic, social networks, and point-of-purchase data, as well as other tools and techniques. What's different is that now they're collecting the address, ZIP Code, census tract, sales territory, street network, service route, or other geographic boundaries in addition to the transactional data itself.

**Keywords:-** Location-Based Analytics; Data Science; Foot Traffic, Context Marketing, Big Data, Analytics 4.0, and Customer Loyalty.

## I. INTRODUCTION

This research discusses e-marketing nowadays which can call it Context Marketing. [2] has defined Context Marketing as: "The ability to deliver the right content or experience to the right person, in the right place, and at the right time based on the total of that person's past brand interactions and current needs Context marketing empowers businesses to know every customer and shape their experiences in real-time and at scale".[3] In 2017, it becomes clear that can talk about context marketing when content meets or exceeds the expectations of customers when they solve a problem or teach the audience something new when they are adapted to what the consumer is looking for.

As illustrated in [4, Fig. 1] Marketers everywhere should turn towards focusing on customer-centric which is based-on contextual customer experience to bypass "a one size fits all" approach to deliver relevant experiences that engage each individual. This isn't as much to "do things better" but slightly to "do things differently". Marketers must use all interactions between a consumer and their brand across digital and physical environments and turn them into experiences that meet customer expectations and are significant to permit further engagement. So, how marketers can get that meaningful experience where there are different customers and different prospects define "meaning" in as many ways as there are individuals? The answer lies in "Context Marketing". In other words, personalizing customer experiences [5]. Businesses will just deliver the information, products, and services consumers want to be based on consumer behavior (i.e., Investigating organizations, individuals, or groups) about their process of selecting, securing, using, and disposing of

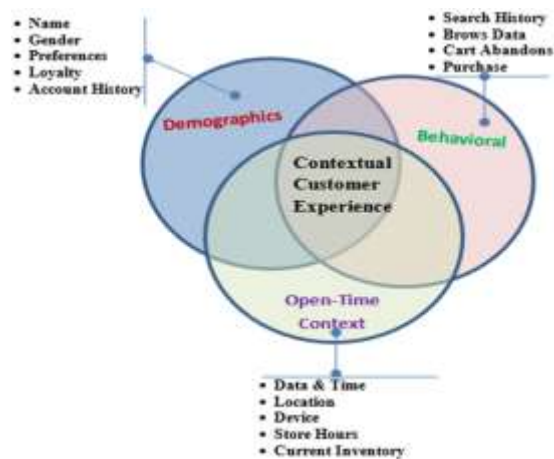


Fig. 1 The Perfect Mix Data.

produces, experiences, services, or ideas for satisfying needs and the impact of these processes on the consumers and societies [6]. Then segmenting, viewing, understanding data and analyzed. That's the benefit of big data and data science (i.e., Data Mining, Predictive Analytics). To make sense of it all, businesses are reconsidering all things data using the power of where. Specifically, they are beginning to use location analytics, and location as a platform, as new technology. The result is complete information and analysis for delivering better results.

Th The simplicity of utilizing GPS-enabled mobile phones and mobile devices facilitates the patron to realize the nearest movie theatre shoe shop or cafe easy net maps let him see wherever he's going and where he desires to be. [7] notes that

the location-based analysis solution enables physical space operators to understand customers in real-time and then send relevant messages that are consistent with their identity and needs. It brings together Wi-Fi access and analysis technology and combines it with social engagement and marketing's tools to help companies gain valuable insights into real-time data insights they can use to create more personalized experiences for all of their customers. Location Analytics lets businesses do more and make sense of their data.



Fig. 2 The Location-Based Marketing

As shown in [8, fig. 2] retail, marketing, real estate, energy, insurance, manufacturing, healthcare, government, planning, and public safety every industry benefit from location data and analysis. Marketing sites can compare sales zone revenue and assess marketing campaign effectiveness. Businesses can see exactly where customers live to determine where to open stores and distribute products. Government agencies show taxpayers wherever and the way cash is spent firefighters get the digital plan in their vehicle before they enter a burning house, hospitals to work out the demand for brand spanking new vaccines, or be of fulminant unwellness outbreaks. This is possible because every information system, desktop solution, or mobile app can take advantage of location. BI, CRM, ERP, SCM or any other acronym you can think of location analytics fits within them all.

[9] [9] has exhibited data science is that the key to finding analytically complicated issues and unlocking insight into big data by combining computer science skills with applied mathematics analysis and a deep understanding of the information and drawback. Organizations can not only make better predictions, but also fill in gaps in their knowledge, and even find answers to questions they hadn't even thought of yet. Using Data Science in social marketing through sentiment analysis could uncover how business customers are feeling about recent campaigns, announcements, and more, without the time-consuming process of reading through each post. That will strengthen the business insight, customer engagement, and more personalized experiences for all targeted customers, which means accomplishing a study of his behavior to enhance the ability to predict the demand of products or services.

According to that concept, we are going for Innovative **Intelligent Marketing (iMarketing)**. Utilizing I-Marketing (method of getting inquiries from potential customers) leads to the techniques & Strategies traditionally used in corporate marketing for building a business database [10]. The research

will model each online and offline contextual customer knowledge to determine the best way to best engage a business's audience online. Data modeling is at the heart of everything that iMarketing offers through transactional, psychographic, demographic, and behavioral models to enhance the business database. This data modeling allows us to most efficiently identify the next new consumers. Starting with an analysis of the business database, iMarketing builds a model of individuals most likely to give over the phone using transactional, psychographic, behavioral, and demographic overlays. Our proven targeted electronic messaging not to mention powerful knowledge models and a live fulfillment system make sure you optimize business data.

My research aims to tackle the problem of automatically identifying, Clustering, and classifying dynamically socially produced online data into intent categories and the practice of delivering marketing to a specific audience or demographic based on their location- Analytics, moreover can predict consumer need. To achieve this aim, I will be designing an Intelligent Marketing model "iMarketing".

The outcome of this research project will empower marketers and business owners to derive knowledge from large amounts of online data and to formulate decisions, converting data into actionable knowledge.

## II. PROBLEM DEFINITION

The question is how enterprises may properly utilize social media and social networks to achieve required results to add value to their brands, make profits and increase marketing. Answering this question is difficult and needs a certain level of expertise and knowledge, including insights into marketing strategies, processes, and customer behavior. For this reason, many enterprises employ social media managers in the marketing department.[11] argues that the significance of social media is these days so great that firms ought to have separate departments for handling the company's members of the family on social networking sites. As reported by [12] one of the responsibilities of social media managers is to develop and follow strategies and guidelines for the company's online presence. These guidelines are usually based on studies concerning the sentiment analysis on social networks. Definitely, an important study about the utilization of social media for marketing purposes has been conducted because it provides companies the opportunity to present more marketing content to more consumers at a lower cost. So, how could a company correctly construct and implement social media strategies? And, what is the optimal approach for an enterprise to construct and implement their marketing strategies in social media for achieving their target audience? That's led to elevate brand consciousness develop a brand identification and advantageous emblem affiliation and enhance communicate and interplay with key audiences.

## III. OBJECTIVES OF RESEARCH

The significance of this research lies in applying the consumer socialization process in the context of social

network sites marketing using a brand page. Based on the preceding problem definition, the prime aim of this paper is to observe how any enterprise utilizes its social media network (Facebook, Twitter, Instagram...etc.) customers, follower's page and to analyze how users behave in reaction to the content posted to this page. However, several practical questions arise when dealing with the objective of this research such as:

- 1) Discovering the influence of brand post characteristics on the enterprise brand page popularity and engagement
- 2) Targeting and segmentation, behavioral targeting and segmentation, social targeting
- 3) Exploring the social networks' marketing efficacy in customer conversion for analyzing, measuring, and optimizing marketing efforts.
- 4) Predictive analytics using social network data, B2C marketing, and personalized social advertising that can target audiences using proper methods and increase your sales and audience loyalty.

The ultimate objective of this research project is to provide tools for improvement of marketing over social networks methods for any parties who intend to embrace marketing on social media in general.

#### **IV. LITERATURE REVIEW**

This next section reviews the recent literature on web 2, E-Marketing and Customer Engagement, marketing or customer segmentation, Market Segmentation and Clustering analysis, social media and online community, Social Media Marketing, Social Media Analytics, Social Media Marketing Analytics Tools, Social Media Marketing Strategies and Geo-Targeting.

##### **A. Web 2.0 and Social Media**

Currently, the terms Web 2.0 and social media are new terms in the internet and marketing dictionary and there is no general agreement as to their exact meaning. The term Web 2.0 was brought in 1999 which demonstrates web sites that use generation past the static pages of in advance web sites in 2007 [13] have described that "*Web 2.0 is a set of economic, social and technology trends that collectively form the basis for the next generation of the Internet, a more mature, distinctive medium characterized by user participation, openness, and network effects*". Generally, a Web 2 site lets net customers engage and collaborate with others primarily based totally on a social media dialogue. By the usage of Web 2, small organizations have emerged as more competitive to compete with large companies, those customers are described as creators of user-generated content [14]. Technically samples of web2 of includes social networking (Facebook), blogs, wikis (Wikipedia), and video sharing sites (YouTube).

Social media platforms are gaining momentum in terms of usage rates and going global in daily lifestyles thanks to the spread of mobile devices, they are proving to be valuable

marketing channels. Social media are innovative Web-based applications in online marketing [15]. Companies utilize social media to form online communities to (1) build new business models that include a new product marketing channel, and (2) build strong relationships with consumers by overcoming limitations of time and place [16]. As a new marketing network, online communities allow marketers to:

1. Gathering content information about probable or current consumers from their profiles,
2. Conclude consumer's needs and preferences based on their history of behavior, and
3. Get direct replies from consumers [17].

Marketers can understand each consumer's needs, using this information to develop new products or services.

##### **B. E-Marketing and Customer Engagement**

Because of the competitive business environment, nowadays organizations attempt to improve customer experience, achieve customer retention, and expand their customer database. The increasing need to keep the customers satisfied and concerned as individuals via offering the right products and services at the right time has triggered interest in customer engagement. According to [18] customer engagement is defined as "the behavioral manifestation of a customer towards a trademark or company that goes beyond buying behavior". Organizations have already initiated the use of that concept with their customer relationship. Also,[18] have been defined engagement as the habituation or daily routine, continuance intention, feeling of being out of touch without access, anxiousness without, love, need to deactivate, worry (negatives) brand equity/price sensitivity.

##### **C. Market or Customer Segmentation**

As defined by [19] Market Segmentation "*the identification process customers who comprise a homogeneous group of consumers for a specific range of goods and services*". On the other hand, customer segmentation takes place within a certain and defined market; "*it is the grouping of the customers within a market, which has already been defined.*" Customer segmentation is the method of categorizing customers with heterogeneous characteristics into distinct homogeneous groups based on common attributes [20] customer segmentation is a critical element for e-marketing and customer engagement for establishing interaction among organizations and customer. They often thought that the meaning of Customer Segmentation is considered the same as that of market segmentation. However, there is a difference between the two concepts that should be underlined. The main goal of a marketer that performs customer segmentation is to develop effective marketing strategies to achieve various marketing objectives. More specifically, Online and interactive marketers are interested in knowing their customers better and being engaged with them, by implementing suitable marketing strategies.

##### **D. Market segmentation or Clustering analysis**

In Data Analytics of markets, we often have very big data (many observations), which are however similar to each other hence we may want to organize them in a few similar segments with similar observations. [21] clarified, Market segmentation is an essential and popular marketing tool that can offer businesses insights for growth (i.e., novel product ideas) and productivity (i.e., improving marketing communication and focusing on the right audience). Where [22] has introduced that market segmentation consists of “*observing a varied market (characterized variation of demand) as many smaller homogeneous markets in responding to differ product preferences through significant market segments*”. There are many different reasons for a business to segment their market, due to differing individual needs of customers [23]. So, it makes sense that a business creates separate offers for each segment of the market. This gives customers a better solution (whether it's a product or a service) and helps raise profitability in the entire business. Nevertheless, the risk of segmentation outcome may fail is high. A Harvard in 2005 business paper [24] stated that in the United States 85% of the 30,000 new product launches failed due to poor market segmentation. Both business and analytical considerations play a big role throughout the segmentation development process. [25] in 2014 Springer Texts in Business and Economics (STBE), mention that cluster analysis is an appropriate method for recognizing groups of similar objects called clusters. Observations, or cases of objects in a particular cluster, shared many characteristics but are very different from objects that do not belong to that cluster. Clustering techniques had been defined by [26] that are used to group data or observations in a few segments so that data mean when we say “similar” or “different” observations is a key part of cluster analysis which often requires a lot of contextual knowledge and inventiveness that are applied by statistical tools can. The clustering is accomplished by finding similarities among data according to characteristics found in raw data [27]. The clustering process is not a one-off task, but a continuous and iterative knowledge discovery process from large amounts of unorganized raw data. Clustering techniques are generally classified as:

**a) Hierarchical Cluster Analysis (HCA)**

Hierarchical clustering received their name because they build a group of clusters that can be depicted as a hierarchy of clusters [28]. [29] in 2007 thought the hierarchy can be constructed in top-down (called divisive) or bottom-up (called agglomerative) fashion and it can be subdivided according to [30]:

- Agglomerative clustering, where each observation is initially considered as a cluster on its own (leaf), then other homogeneous clusters are gradually merged together until creating only one big cluster (root)
- Divisive clustering is a reverse of agglomerative clustering that starts at the root, where all objects are included in a cluster. Then, the most heterogeneous

clusters are successively split until all the observations are in their own cluster.

**b) Partitional Cluster Analysis (PCA)**

PCA is an alternative approach to partitioning clustering for grouping objects based their similarity. [31] explored that partitioning clustering technique that subdivides the data sets to a set of *k* groups, where *k* is the number of groups pre-specified by the analyst. Unlike partitioning clustering, hierarchical clustering does not require need pre-specify the number of clusters to produce a data clustering to discover a new customers segment and purchase behavior. Clustering data uncovered a new customer segment and its buying behavior. Clustering applies models and hundreds of data sets to predict a customer's likelihood to purchase. Clustering applies models and hundreds of data sets to predict a customer's likelihood to buy. After determining the desirable segmentation which is suitable for an organization to develop its targeted and effective marketing plans. Moreover, market segment analysis helps in making decisions about the density of marketing activities in a specific segment [32]. [32]. The objective of cluster analysis is to spot groups of objects (in our research customer behavior) that are terribly similar with relevancy their behaviors (i.e., Purchasing behavior, loyalty, Interest ...etc.).

After having selected the cluster variables the organization needs to make their mind up on the clustering procedure to form their groups of objects.

**E. Social Media Marketing “SMM”**

Social media marketing differs from traditional marketing in many ways [33]:

- 1) Social media marketing exists completely online, whether via website or app.
- 2) Social media is available in real-time and 24/7. Organizations can initiate or respond to live events as they occur.
- 3) Social media marketing is constantly evolving with technology.

Social media marketing provides opportunities to increase brand recognition and long-term loyalty. Brands can make lifestyle connections through social media [34, fig.3]. As well, social media allows companies to respond to users during a crisis or react quickly for more valuable customer service. Some important social media platforms include Facebook, Instagram, Twitter, YouTube, Snapchat, and WhatsApp.



Fig. 3 Social Media Analytics Driving Better Marketing Decision Insights into Customer Behavior

Social media is growing rapidly and it offers something for everyone. With the growth of mobile technologies, the influence of social media is instant. This development has forced marketers to take social media seriously and start strategies around it [35]. However, without the proper backing of data, no strategy is complete.

#### **F. Social Media Analytics “SMA”**

[36] indicate that social media analytics helps inform, understand, and then leverage communities for societal activities and business offerings, it is a powerful tool that helps marketers find customers’ sentiments across the online channels. It is useful in understanding customers in three important ways:

- 1) Customer sentiments are usually helpful in understanding customer opinion concerning the brand and its merchandise and services.
- 2) Social media trends are temporary. These trends are largely influenced by economic, social, or political happenings. Hence, the customers’ approach towards these trends will also be periodical. In such a state of affairs, marketers will use these trends to create a method to extend awareness regarding their merchandise or services.
- 3) However, without the data the analysis of real customer behavior is impossible. This is where social media analytics come into the picture.

#### **G. Social Media Marketing Analytics Tools**

Marketers nowadays got to affect a big number of channels and need to grasp the client journey across them and to involve potential customers who are more and more each technical school and knowledge savvy.

Marketing analytics is about getting the advantage of data analysis to make marketing more efficient and effective. It involves analyzing, measuring, and optimizing marketing efforts so that marketing expenses are not wasted and adjustments to campaigns can be made more quickly [37].

#### **H. Social Media Marketing Strategies**

[38] Had been defied, an organization's marketing strategy that combines all of its marketing goals into one comprehensive plan. A good marketing strategy ought to be derived from market research and focus on the right mix of products to achieve maximum profit potential and sustain the business. The marketing strategy is the basis of a marketing plan.

#### **I. Geo-Targeting Marketing Strategy**

Thirty percent of the world's population are already using location-based marketing services or (Geo-targeting), and 80% of them want to get location-based alerts from businesses like yours [39]. While mention that geo-targeting (sometimes spelled geotargeting or geo-targeting) involves detecting a user's location and serving them communications based on

that location [40]. Those communications can be ads or alternative content, like an email or push notification. Also clarified, Geo-targeted communications are delivered most commonly through text or push, and might also come when customers open a certain app or social media site. The good thing about geo-targeting is simply increased personalization. Besides its content can be paired with data about user preferences and activities to hone in on specific groups of people, and also exclude groups of people the company doesn't intend to target. Geo-targeting permits companies to focus on a user where their device goes.

### **V. RELATED WORKS**

In this section, some of the previous works and their aspects will be summarized briefly. There are several works related to automating Data Science which is capable of clustering (social media marketing, customers, life events, services.... etc.) and how to classify it and get that unique pattern which will help for generating the future of clustering subject. [41] are discussed in the 36th international ACM SIGIR conference, the most interesting research that had issued Illustrates the majority of existing e-commerce recommender systems try to mention the required product to a user which is concluded by whether or not the customer is likely to purchase or like a product. The strength of recommendations also depends upon the time of the recommendation. Therefore, it allowed companies not only to follow the current consumer but also to give them a recommendation for the purchase of a new product or service. In cases like this, it is not a good idea to recommend (i.e., a fresh laptop or a replacement battery soon after the customer purchased the new laptop) what could cause dissatisfaction to our consumer by the recommender system if he receives a potentially appropriate product recommendation at the wrong time. We believe that something shouldn't only recommend probably the most relevant item, but furthermore recommend at the perfect time. We started by investigating the possibility of forecasting a user's purchase behavior through a product or service based on his posts on social networks. There is research presented by [42] proposed a configuration of neural networks that use predicted tweet relevance in purchase prediction. The input for each user is a sequence of tweets (instead of words, as is more commonly used) enabling the preceding tweets to provide context for the current tweet. To model the information in a tweet sequence the deep learning techniques for predicting customer purchase behavior from Twitter data recommended by the system is intuitively a good choice. Where they collect a labeled corpus of buy/not buy users and their tweets. [42] found that the use of a deep learning model that incorporates sequential information performed better for the purchase prediction task. Since the Internet has become a platform for communication, socializing, and learning activities, social media, and social networking have gained popularity as the primary networking tool for consumer interactions. [43]. Social media has become a medium that connects people with increasing numbers of

digital media options [44] and often functions as an important platform not only for strengthening friendship but also for Location-Based Marketing [45]. [46] are discussed the turning of many organizations into ground-breaking digital media technologies to develop their marketing communication channels, extend effectiveness, and reorganize extra mobile marketing strengths into the marketing world. Location-based advertising and marketing are the fast and most crucial transformers in cellular advertising and marketing. Location-Based Marketing (LBM) technology is being developed rapidly every day, opening new incredible opportunities. The success of LBM depends on various factors related to customers, the marketing strategy of the company, and various other factors related to service providers. Companies that use location-based marketing will assist their marketers to formulate the better off sales revenue or profits by scattering markets into non-visible and can touch most of the customers by using the mobile application for LBM as its landscape is small [47]. Meanwhile building a competitive environment can be exceptionally supportive for marketers to decide about the location-based services and their benefits step by step.[48] indicate that, although it hasn't reached the appropriate level of technology, introducing location-based marketing and services will definitely facilitate many companies and marketers to promote their goods and services productively.

Business Information System “BIS” is the subject of the dynamics of traditional business environment that needs to be flexible enough to absorb the inevitable changes and diversity of information and its resource. BIS is a mixture of information gained from multiple sources of data like mobiles, sensors, and IoT that enclose business enterprises with its strategies and techniques used in marketing especially market segmentation.

## VI. METHODOLOGY

Recently, researchers and specialists are trying to develop models in the area mainly focusing on qualitative research, [49] are discussed these, provides information about the “human” side of an issue that is, the often-contradictory behaviors, beliefs, opinions, emotions, and relationships of individuals. Qualitative strategies also are effective in distinguishing intangible factors, similar to social norms, socioeconomic status, gender roles, ethnicity, and religion, whose role within the research. Grouping under a series of the description of targeted market segmentation based-on customer behaviors. Given various research purposes, different people have different views on classification, which also results from the difference.[50] showed that a small retention rate can result in a significant change in profitability. Therefore, researchers are moving towards an objective and accurate mathematical model to avoid differences as well as provide more accurate and objective classification results. Social Media Marketing and Analytics are based on customer classification which is often necessary to take deliberate classification with the existing customer data. Classification classes and quantity are already recognized before data mining.

The method called cluster analysis, of which the quantity and type of object class were unknown before data mining is very hard to meet the requirement of service mining. Thus, a more practical method called classification emerges. In classification, the type symbol of a sample unit or the data object is already known in the training set and the mission of classification is to classify the type unknown database on the law found from the training sample in [51].

So, this research as the next flowchart illustrated in fig. 4 that displays the proposed framework model is going to use integrations of two techniques to get optimum results for social media marketing analytics:

- 1) **Firstly**, in this study, the data sample is collected via social networks (i.e., Facebook, Twitter, Google+...etc.).
- 2) **Secondary**, fined social media market **segmentation** using an innovative computational intelligence technique then;
- 3) **Thirdly**, social media marketing **analytics** using a conventional computational intelligence technique.

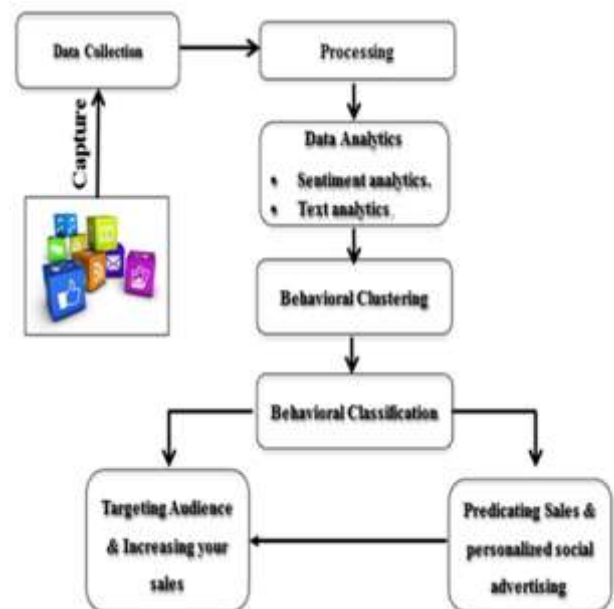


Fig. 4 The Proposed Framework Model

- 4) **Finally**, **Geo-targeted** certain users in the target area (based on demographic, for instance).

## J. Materials and Methods

Research investigations in different organizations have recently shown that a huge amount of data (big data) is being stored and collected by devices from social media and this large amount of stored data continues to grow fast.

Social media allow companies to engage and study in timely and direct end-consumer contact at low cost and higher levels of efficiency than can be achieved with more traditional communication tools [52]. There is a study of consumers that said companies and organizations improve their marketing strategies by understanding issues many a lot of important

aspects. The understanding of consumer behavior is an important aspect of marketing. [53] clarified that, consumer behavior means the study of individuals, groups, or organizations about their process of selecting, securing, using, and disposing of the products, services, experiences, or ideas to fulfill needs and the impact of these processes on the consumer and the society.

The next section will explore the materials and methods that we are going to use after gathering the data. Swarm Intelligence (SI) will be used to market clustering and segmentation and Artificial Intelligence tools for marketing analytics and predicting in this research. project.

### **1) Data Collection and Pre-Processing.**

Data is a piece of information that is needed to form useful information. From this perspective, data collection is an important step when doing any research or experiment. Data collection can be defined as the process of gathering and processing the information to evaluate the outcomes and use them for the researchers [54]. Collecting data can be done by using different techniques based on the source of the data. Some examples related to data sources involve people interviews, surveys distributions, and Social Networking sites. Social Media are one of the best sources of data. Social Media data is spread throughout the Internet in many forms, but most are in the form of micro-blogs or posts, which are found on various online social networks such as Facebook, Twitter, etc. Social Media provide a powerful source for data collections, moreover, these sites store information about people based on demographics, their relationships with other users on the same site, and their ranking, categorized information depending on the nature of the sites. Facebook is a Social Networking site that provides some services such as posting status, posting images, and making friends. It is a great source of big data. From this perspective, there are different techniques to collect the data. For example, it offers Graph API Explorer which is a great tool to generate data by either using Graph API or Facebook Query Language. According to Meta for developer page [55] It's a low-level HTTP-based API that it can use to query data, post new stories, upload photos, and do a variety of additional tasks that an app. might need to do. In this research, data were mainly collected from Facebook in the first quarter will be used to predict the segment in which customer belongs at the end of the year.

### **2) Innovative Computational Intelligence Technique.**

Nowadays, big data analytics has attracted more attention, which is required to manage huge amounts of data rapidly besides the other characteristics of big data (i.e., high variety and high velocity). These challenges faced are high dimensionality, dynamically changing data. Swarm intelligence (SI) can solve dynamical, huge, and multi-objective problems. [56] are discussed Swarm Intelligence often known as collective adaptation has shown significant results in solving dynamical, large-scale, and multi-objective problems. Swarm is the collective behavior of decentralized, self-organized, natural, or artificial systems which is based on a population of individuals where each

individual represents a potential solution of the problem being optimized. Swarm has recently emerged that meets these requirements (customer clustering) and has successfully been applied to several real-world clustering problems [57]. The most popular swarm intelligence models namely are:

- **Particle Swarm Optimization (PSO):**

Particle swarm optimization is a population-based stochastic algorithm for optimization that uses the concept of social psychological principles. They are interaction among the population members produces an iterative improvement of the quality of problem solutions over time as shown in [58]. A PSO algorithm is a heuristic optimization technique that can find the global optimum of a given objective function. Recently, Particle Swarm Optimization (PSO) techniques have attracted many researchers to optimize model parameters in different research fields. Due to this, the PSO algorithm has the ability to constrain problems and impose nonlinear limit functions, moreover, we can use it for multiobjective optimization as shown in [59]. In statics and strength of solids, the PSO approaches are applied for example in shape optimization in [60] or as [61] said in big data clustering which has extensive usage in machine learning, data mining, data analysis, marketing, pattern recognition, image segmentation, and many engineering fields. Also, to reduce the cost (time and infrastructure) of big data processing to more than half when compared with ordinary applications as expounded by [62].

- **Ant Colony Optimization (ACO)**

Ant Colony Optimization algorithms are mimic the behavior of natural ants with the use of artificial ants as agents to find a reasonable solution to optimization problems by following the optimization model used by natural ants to arrive at their destination in the shortest possible time. It is a probabilistic technique for finding close to optimal paths through a problem space [63]. ACO may be a heuristic technique for the resolution of an awfully general class of process issues by combining user-given heuristics within the hope of getting an efficient economical procedure. Ant Colony Optimization applications are routing in telecommunication networks, traveling Salesman, graph coloring, scheduling, and constraint Satisfaction as shown in [64] Handbook.

The author's attention is going to focus on the PSO as a swarm intelligence model in big data mining over social networks for marketing segmentation. SI or Social Swarming is an innovative new methodology for market research. Professional market researchers want answers to questions all the time on a wide range of topics. This means three issues generally keep them up at night:

- How fast can we get answers?
- How reliable are the answers?
- How few people do we have to talk to?

### **3) Conventional computational intelligence technique.**

Neural networks can predict the belonging of each customer to a specific segment based on data from social media. Artificial Intelligence “AI” are the tools that can be used to improve marketing analytics and to help organizations both better understand their customers and deliver a customer experience. It conjointly provides sensible recommendations on however organizations will use, what they'll already be doing to become more efficacious in marketing. AI is a capability that includes technologies such as:

- Machine Learning “ML”,
- Deep Learning “DL”
- Natural Language Processing “NLP”, and
- Cognitive Computing “CC”.

Enabled by techniques such as:

- Optimization and
- Decision Management “DM”.

**4) Geo-Targeting Methods:**

Geotargeting is an effective factor for digital marketers. The capability of targeting digital audiences with the specific location at high accuracy means reducing wasted impressions and by focusing a campaign on the most relevant target population, a marketer can increase the probability that customers will click on their advertisement. As a result, geotargeted ads can command a 30% to 40% premium over non-targeted ads. With numbers like these, it’s no surprise that a recent Borrell Associates report predicted targeted online display advertising to grow 868 percent by 2016. Social media and mobile devices have modified the face of geotargeting. So, success applying today’s strategies of geotargeting needs careful thought and planning. There are many methods for geotargeting here we will focus on only two methods:

**• Geofencing Marketing:**

Geo-fencing hinges on the use of a “fence” a designated area that a marketer sets. Where geo-targeting allows you to get into more details about the target users or exclude others in the target area, while geo-fencing captured all users who move into a certain area [65, fig.5]. The purpose of creating a geo-fence is to target IoT devices in a given area, like geo-targeting, but with greater accuracy. Retail organizations who want to catch the attention of shoppers as they pass by a store, for example, might use geofencing

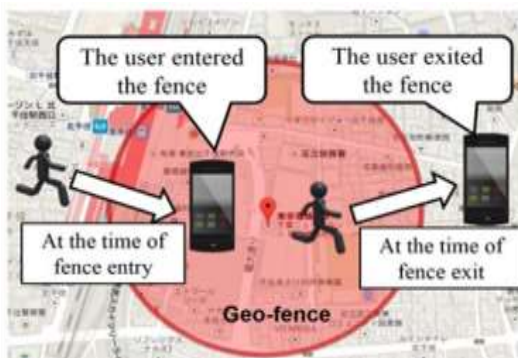


Fig. 5 Geo-fencing Infrastructure: Location-Based Services

**• Proximity Marketing**

To understand what proximity marketing is we need to define the term proximity. [66] has defined Proximity marketing is appearing as a key strategy for marketers to connect with consumers by sending to their smart devices customized messages. That messages should be triggered by consumers’ precise geographic location or factors (i.e., weather, time of day, user preferences, and prior purchase history). Proximity marketing has wonderful potential to deepen consumer (e.g., engagement, build brand equity, strengthen customer loyalty) and Increase revenues across a wide range of companies, including retailers, hotels, casinos, airports, and amusement parks [66, fig.6]

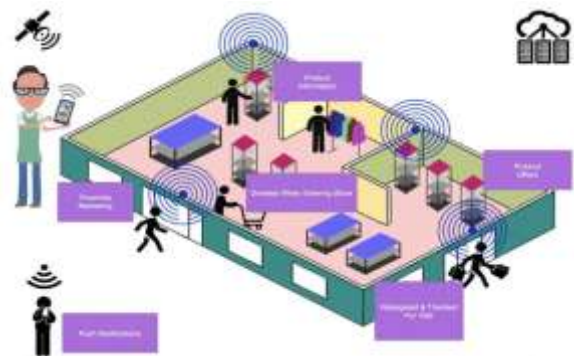


Fig.6 The Proximity Marketing

The businesses can then target device owners with enticing promotional marketing messages. Also known as ‘hyper-local marketing’, which involves targeting potential consumers with personalized adverts based on how near a consumer (or device) is to a specific location and enticing them to make a purchase decision in the near future. [67] supplement that, proximity marketing is a more granular form of location-based advertising, where the communication with a consumer is timely, relevant, and personal, and it is all about using the accurate location of a customer for the specific and contextual communication that is not possible through basic location-based marketing.

**VII. CONCLUSIONS**

It is not enough for an enterprise to do things right. To develop, it must innovate. What others haven’t achieved in the past and can not or dare not do, if successful, is innovation. Of course, not every innovation will succeed and failures are allowed, but the risks must be controlled. Innovation is not an exception, but something the company has to do. Innovation involves many aspects such as knowledge and marketing, as well as the introduction of new management and new and even more specific and smaller things.



This paper contributes a framework model to addressing the benefits of iMarketing over social networks (SMMs). iMarketing focuses on organizing resources, developing skills, and developing strategies to use new era technologies to ensure a strong financial outcome for all key stakeholders and a better quality of life for the community and society. The discussion additionally explains the strategic importance attributed to people, technology, and culture within business and points to the fact that it is a fertile ground for self-study in the relationship between iMarketing and the way it builds it towards dynamic capabilities achieved by the proposed framework model.

In the era of big data, information is becoming increasingly important in today's economy. The way in which business information channels are being developed is an issue that every business needs to address urgently. Some companies use AI features such as natural language processing, pattern recognition, or machine learning to gain insights for its customer in their own organizations, but a growing number of companies embed AI in broader solution sets that they can offer their own customers - smart insights into the market or customer behavior, preferences, and buying behavior at hand without having to deal with the underlying cognitive processes.

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