Adopting Data Mining and Social Media Analytics to Achieve Customer Satisfaction

Mohamed A. Hamada[1], and Adejor E. Abiche[1]

[1] International Information Technology University, Manas St. 34/1, Almaty, 050000, Kazakhstan

Abstract

Every business place priority first and foremost on its customers and products. Companies want to achieve their best to satisfy their customers with respect to coming feedbacks and potential new customers. Nowadays social media plays a crucial role in promoting a certain product and even gathering customers' feedbacks to achieve a high customer satisfaction levels. Mining social media is a useful tool both for businesses and clients. The aim of this research paper is to identify and evaluate effective methods of using social media and data mining in the educational sector to improve customers' satisfaction level. Interviews and analyzing reports were used to collect the data about opinions of adopting data mining and social media in order to achieve customer satisfaction levels.

1. Introduction

Rapid development of information technology has opened new ways to improve business processes and build stronger relationships with customers [1]. Social media is used as a tool for online promotion and advertising of a product as well as collecting their feedbacks to achieve better performance [2]. Furthermore, companies turned social media into a method of gathering information about customers to unlock hidden information and build new ways of reaching targeted audiences by personalizing their promotion tools [3]. In this digital era, the era of social media where products and services are sold immediately by making a few clicks online, business owners must be flexible and ready to adapt business processes accordingly. Educational sector is not an exception in this regard. As an example, this paper will reveal an international school case and will discuss how social media and data mining can be implemented to achieve customers' (pupils) satisfaction.

A government scholarship program is availably applicable for the pupils who are citizens of Kazakhstan at the age of 15-16, who have solid academic achievements. In order to take part in the scholarship program, the applicants should firstly go through one of the Olympiads on Math, Science and English subjects. These Olympiads are considered as a first qualifying stage. The winners are invited to proceed and take part at the scholarship selection exams. The role of marketing and sales teams in this project is to advertise this opportunity and attract young people with potentials to achieve academic excellence and develop strong leadership skills. Finding new talents as well as raising awareness of academic programs at the international schools is the first priority. Thus, choosing the right social media methodology, and using data mining innovative approaches has become one of the important strategies to build strong relationships with the customers [4].

2. Statement of the research problem

The statement of the problem of this case study is to distinguish innovative and effective methods of applying advanced methods such as data mining and social media in the educational sphere to

improve customer journey and as a result their better experience and satisfaction. Improving customer service has become one of the crucial areas for every industry or organization to focus nowadays, especially in these times when the market is overloaded [5]. However, as the educational industry differs from other spheres in the means that the schools do not actually sell goods or provide traditional customer service, adapting new technology tools such as data mining may also become a challenge. For this purpose, this research will explore how educational institutions can adapt according to the recent trends in the use of customer data through social media platforms.

2.1. Purpose of the research

The primary aim of this research is to identify features and benefits of applying data mining and the use of social media and its impacts on customers in the educational sector. In addition, the researchers aim is to focus on the analysis of customer's behaviors from the perspective of marketing and sales departments of a particular school.

2.2. Significance of the study

The problem of achieving customer satisfaction and improving their retention has been well studied. Particularly, there are a lot of studies discussing the examples of retail, banking, hospitality cases etc. Worldwide companies are steadily improving their competitiveness by adopting data mining and machine learning technologies, developing their social media profiles, and promoting their goods using new tools[7]. However, the extent of adoption of the data mining in educational sector is still limited. Therefore, following research questions are stated for the study:
- What are the benefits of using social media and adoption of data mining in the sphere of education?
- What methods of data mining approach can be used to better understand customer needs?
- What is the impact of using these tools in regard to achieving customer satisfaction?

3. Literature review

Customer satisfaction can be defined in a different way, and many authors have provided their own. Tse and Wilton (1988) argues that customer satisfaction is a response to the evaluation of perceived expectations and the actual performance of the product as perceived after its consumption [8]. From that view, it is obvious that meeting customer expectations is the most important priority in the scale of preference, this leads to customer satisfaction theory that was defined by Kotler (2000) as "person's feeling of pleasure or disappointment, which resulted from comparing products perceived performance or outcome against customer expectations"

Customer satisfaction = f (perceived performance, buyer's expectations)

Consumer loyalty or satisfaction is the key promoting idea which estimates the capacity of items or administrations of a brand in gathering or surpassing the assumptions for clients. For instance, building consumer loyalty empowers associations to get a few benefits, for acquiring better bits of knowledge about purchaser purchasing conduct [9] and increasing their deals and overall revenues making higher levels of client dedication and maintenance in the long haul. Sivadas and Baker-Prewitt (2000) viewed consumer loyalty's as a vital determinant of an association's prosperity and it impacts purchaser conduct, repurchase intention, and verbal exchange communication [2]. Considering the significance of consumer loyalty in bringing different advantages for associations as referenced above. It has become imperative to reliably check out the vital drivers of this idea regarding distinctive industrial settings as shopper needs and assumptions will generally change now and again, particularly with the quick increment of mechanical progressions being joined on flow items and administrations presented by different businesses [14].

3.1. Data mining and CRM

To discover customer satisfaction, it is appropriate to apply data mining technique, which is a technique that extract information from the data base and analyze it [10]. By applying this technique, organization can perceive a clear view of company policies and limitations regarding customers. Data mining technology is used to collect a lot of information for companies and from companies and analyze them to find information that will be applicable to them. Such companies can make decisions or judgments based on the corresponding information [16].

Data mining is not mining in the conventional sense. It intends to extricate data that is significant to individuals from repetitive information. It's anything but a visually impaired extraction. These significant data or laws accommodated people or undertakings [6]. For instance, nowadays, it is broadly utilized in things suggested on internet shopping sites, just as customized pages on certain sites. Tracing its source is inseparable from data warehouse technology, an innovation used to handle gigantic business information, searching for the secret routineness behind it, and simultaneously displaying it to give a reference technology to chiefs, to be in the market to take the high ground and gain a profitable position. Contrasted and customary information investigation, it has no speculation, that is, it concentrates and finds helpful data under the reason of no theory [17]. The relationship of organization with its customers is important concept that called Customer Relationship Management (CRM). In recent years, in every industry CRM plays significant role for the organization [7].

Within the development of communication technology, CRM has become more available and closer to organizations, due to opportunity. This is quite similar to how customers gather and exchange vital knowledge about various products to acquire and consume them. Through active sharing of information on accessible products and services, the advent of new social media has empowered customers with a variety of options. For instance, new social media websites, blogs, and other forms of digital communication have made it possible for consumers to interact with corporate stakeholders and a huge number of customers at any time, regardless of their geographic location [11]. Customers have gained important experiences and a higher quality of life as a result of these improvements. Edosomwan et al. (2011) described social media marketing as a sort of online communication in which people share and exchange information regardless of where they are. In the same vein, social media has been defined as a set of web-based or online-operated communication channels and mediums primarily geared to facilitate interactive information sharing among individuals/users (Esu & Anyadighibe, 2014) [13]. Nikolas et al. (1999) provided the concept of MUSA (Multicriteria Satisfaction Analysis), the main goal of this concept is to aggregate individual preferences into a collective value function [12].

4. Research Design

For this particular study, mixed research design was used. Recently, this method has been recognized and used by many researchers in their studies [12]. Mixed approach includes two phases in which qualitative and quantitative data are handled to answer the research questions. Thereby, by using both qualitative and quantitative data, it is much easier to understand and gain a more complete picture of the problem related to specific areas [15].

Qualitative data is commonly used by conducting face to face interviews, so this type of gathering customer's data is used to identify customer's values and needs. Respondents' answers may differ somehow, but it is considered as a key to success in order to meet their preferences [13]. Internal qualitative evaluation oriented with employees is the way of understanding customer preferences and also provides customer critical areas [4]. In this research interviews with the marketing and sales team were conducted and also reports on the promotion of the "Teaching English for Intercultural Communication" school project was analyzed.

The research model identifies how the use of social media can achieve customer satisfaction as they help to understand customers' expectations and trust each other in order to attract more satisfied customers [16].

4.1. Population and sampling

The population for this study is defined as any marketing and admissions departments who would and business owners of educational institutions who would like to adopt data mining and social media instruments to build better customer journeys and achieve their satisfaction. In addition, the findings of this study will be applicable for any people from educational institutions, or people who are involved in education management, who are interested in improving business processes, especially sales.

The international school where this research was conducted runs three Olympiads on different subjects as a first and qualifying stage for the annual scholarship program. All Kazakhstan pupils at the age of 15-16 can apply and try themselves. The scholarship itself gives a great opportunity to the pupils to acquire international education and finally to be granted with an A-level certificate. The aim of this program is to attract great talents with a huge potential of future leaders. To achieve this, it is important to promote this project properly as this project is applicable for a specific set of customers. By customers it is necessary to clarify that they might be parents or applicants of a set age on their own. Consequently, members of marketing and admissions (sales flowingly) departments of this school agreed to share their experience and contribute to this research study.

5. Research Results and Analysis
5.1. Findings of the promotion through social media

In order to answer the third research question, what is the impact of using these tools with respect to achieve customer satisfaction, the researchers studied the reports of the promotions which were made based on the data mining approach by using social media tools. To be more precise, promotion of Olympiads for the scholarship program took place mainly through Instagram, and Facebook. The reports were studied and were presented in graphics and organized with the summary of the main promotions of scholarship program and each Olympiad separately. In Figure 1 below, the results were presented in relation to performance overview, meaning how many clicks were presented, age and gender distribution and placement per social media platform.

The promotion of the scholarship program took place between July 10th 2021 and September 7th 2021. The following figure illustrates the reach of 593 027. The reach of the audience fluctuated throughout the stated period.
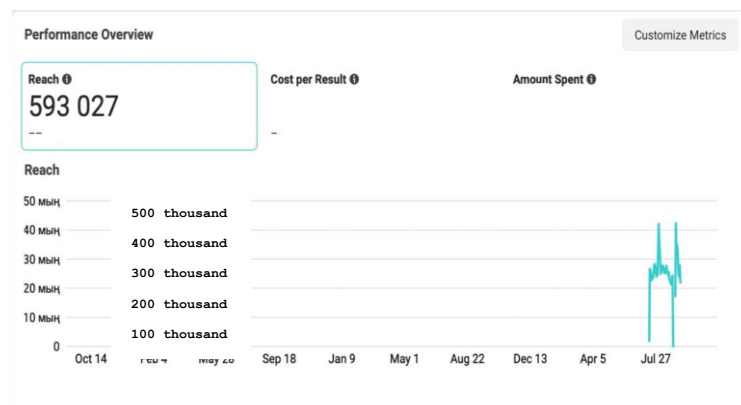

Figure 1: Performance Overview

Figure 2; introduces gender and age distribution of the scholarship program promotion. It states that mainly the audience that viewed and interacted with this promotion are between 18-24 years old with a number of approximately 120 000 people and around 100 000 viewers are at the ages between 25-34 with a slight difference from the previous group. Gender ratio is almost equal with a slight preponderance in favor of the male, 53 % and 46%.
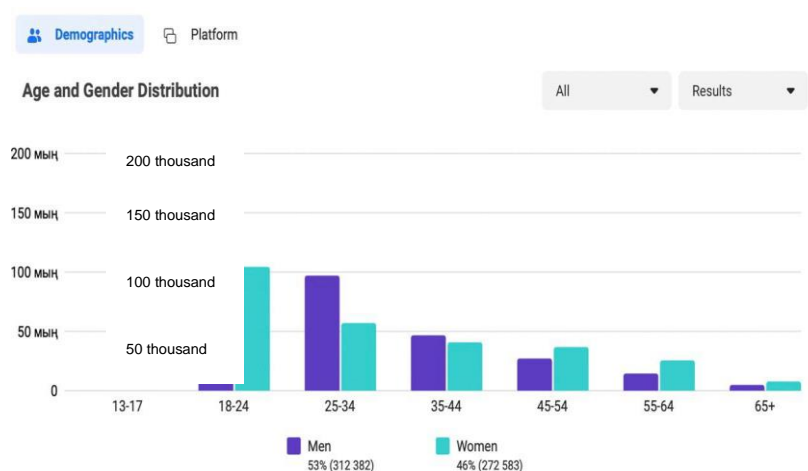
Figure 2: Gender and Age Distribution

In Figure 3, Placement per platform figure illustrates that the main reach of the audience, about 500 000 people, happened through Instagram platform and about 100 000 people from uncategorized resources.
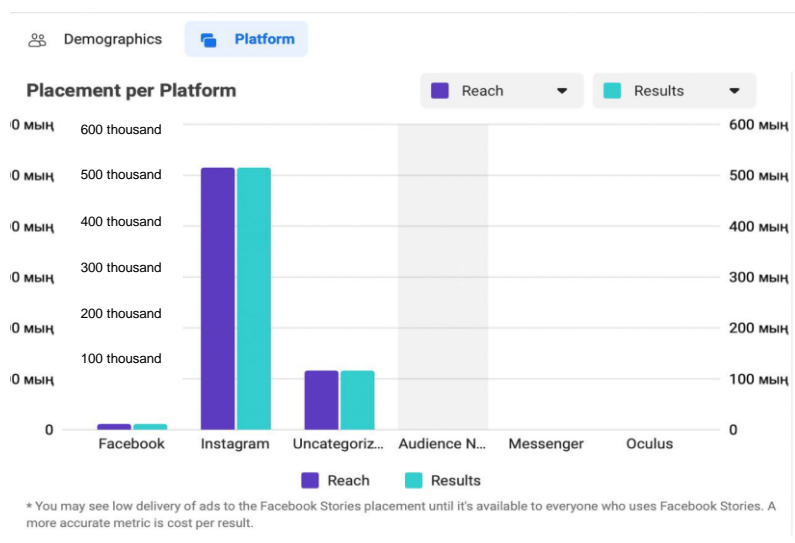

Figure 3: Placement per Platform

In order to have a clearer picture, it is better to analyze the results of the promotion of the Olympiads separately too as in Figure 4. Firstly, the researchers processed the data of the Science Olympiad advertisement through social media. Overall, this promotion reached a population of 1,945, with male and female ratio of 32 % and 65% respectively as shown in Figure 5. In Figure 6, the biggest number from the reached audience were females at the ages between 35-44. About 300 people are females at the age between 18-24. And the rest are young people of 13-17 ages who might fall into potential participants. The main platforms for the promotion are Instagram and Facebook with impressive predominance of the first one.
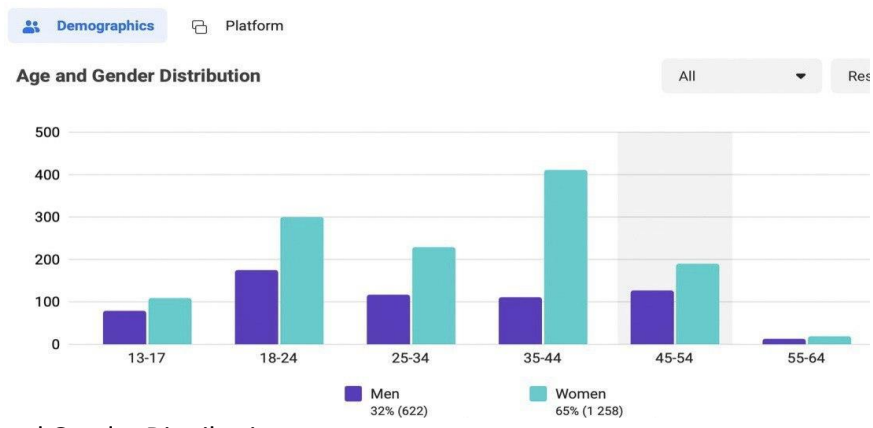
Figure 4: Promotion of Olympiad

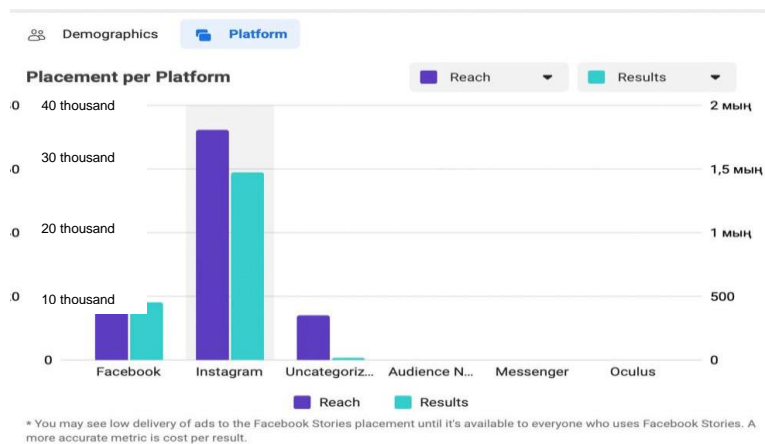**Figure 5**: Age and Gender Distribution

Figure 6: Placement of Participants per platform

For the Mathematics Olympiad promotion, the researchers relied on similar data and dimensions.

The potential customers with the number of 1,348 people as shown in figure 7 was carried out. Age distribution is 24% males and 74% females. Interestingly there is a predominance of reach to young people at the ages of 13-17 as depicted in Figure 8 who might turn into the Olympiad participants, and subsequently, females between 18-24 years old and 35-44 years. Consistently, Instagram is considered to be the main primary platform to place a promotion followed by Facebook as illustrated in Figure 9.
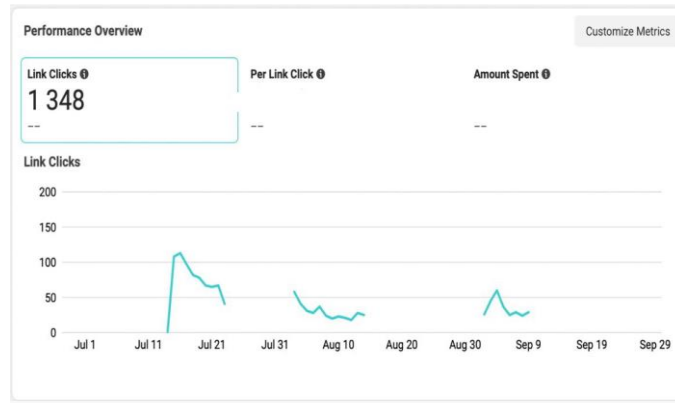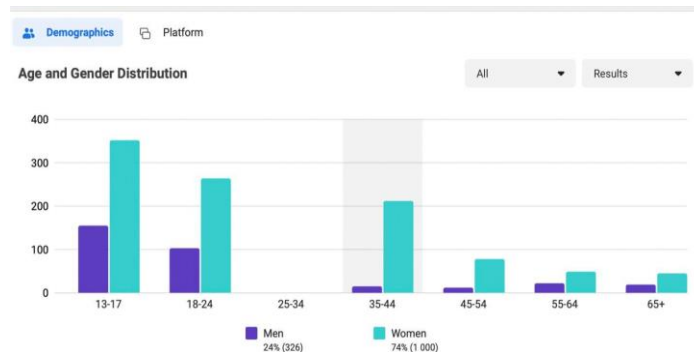
Figure 7: Performance Overview

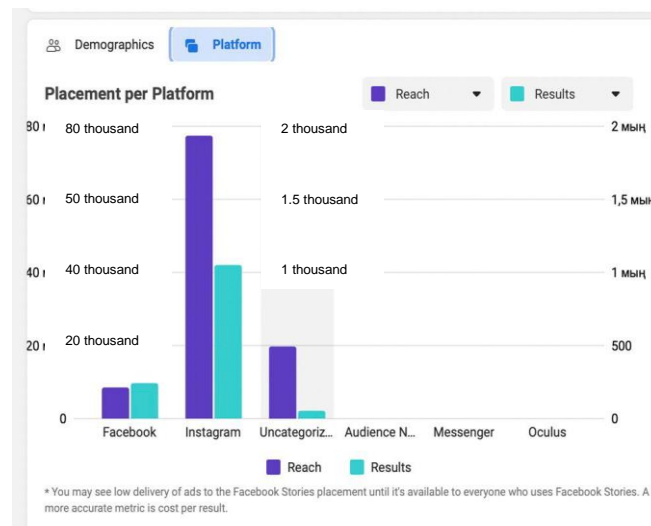**Figure 8**: Age and Gender Distribution

Figure 9: Placement by Platform Promotion

5.2.   Interview Findings

In order to get deeper understanding the nature of the promotions which were discussed at the previous section and the ideas on which these social media advertisements were built, the researchers decided to interview one member from marketing department who implements data mining methods and works on social media development and one member of admissions department who then dealt with the product of these promotions and enquiries. The answers of the marketing member will be displayed as M consequently and the member of the admissions department as A respectively.

According to the answers of both interviewees, social media significantly helped to promote the scholarship program and reach appropriate audiences and consequently in achieving their satisfaction. However, the answers differed from the perspective of their specific role in this program.

M: Of course, social media played a crucial role first of all in building the awareness of the scholarship program and Math and Science Olympiads separately too. In regards of achieving customer satisfaction, I can underline that nowadays social media is a great tool where you can place the information about your product, we did posts about the programs, included it in the highlights of Instagram for example, put the tap links to improve customer journey and make it easier for them to reach necessary information.

A: Yes, the existence of social media really simplified the communication with potential participants of the Olympiads as well as with their parents. Because whenever there was a request and I fulfilled it, I could then support and follow my answer with a specific link to our social media posts. And the feedback from the parents is really good as it is really convenient when you have visual understanding too. Also, there were times when customers came from Facebook or Instagram with direct messages and communication where they received main information and followed to talk to the member of Admissions and gain more detailed information. And before speaking to the parent, I could check what he or she was interested about and could prepare useful information and predict customer's questions which made a good impression on the applicant.

Data mining also affected the process of building customer journeys and the way they are targeted and treated. According to the member of the marketing team, they installed Facebook Pixel settings to the website specific sections and could gain relevant information about visitors' behavior and by analyzing this data could take actions on targeting their promotions.

M: Well, we are not involved with the concept of big data actually as in banking or e-commerce sectors for example, however we do use Facebook pixel ads if we can call it as a tool for data mining. Basically, what Facebook pixel allows us to do is to gather customer's data. Precisely, it collects users' unique IPs, those who visited or started to take actions on our scholarship page or senior school, A-level sections on a website. After receiving this information, we can filter it and target our actions accordingly on those who somehow couldn't finish their journey by applying. In other words, we could remind and trigger them to take actions, or appear again if they decided to postpone the application etc. Data mining also affected the settings that we customized to our advertisements in terms of the age's ratio, selection of the platforms.

During the interview the respondents also listed some pros and cons of using data mining and social media.

M: In my opinion, the use of data mining and social media made a huge difference in our working processes, and one of the benefits of it is that it simplifies your work by helping to understand customers' behaviors and adapt decision-making accordingly. It also automizes the processes and shortens the time that you spend on customizing the settings of *promotions and helps to narrow the audience. However, at the same time it doesn't mean that the targeted audience will reach the final stage of your customer journey. So, you shouldn't rely on it 100%.

A: As a person who directly works with customers, who interacts with them in the real world not as marketing members, I think social media and data mining contributes to my work too as I can use social media platforms as an additional path to interact with potential customers and even gain relevant information to build close relationships. However, sometimes as social media are easily accessible and convenient for interactions the applicants could text you at any time of the day and would expect your assistance immediately which can sometimes disturb your work-life balance.

Both interviewees also agreed on the role of social media and data mining approach in this project as these tools work together in a good way and help to achieve goals in improving customers' experience. Social media manager added that it plays an image supporting role in this digital era.

6. Research discussions

The aim of this study was to identify features and benefits of applying data mining and use of social media and its impacts on customers in the educational sector. Relying on three research questions, the researchers identified that data mining and social media can be well combined when educational

institutions focus on specific projects such as Scholarship programs as in this particular case. Precisely, one of the examples of data mining for the marketing departments of international schools might be Facebook Pixel code which can be incorporated into website sections. This allows to trace customer behavior patterns and help to attract a quality audience by reminding, raising awareness, and calling for actions and individualizing your communication by understanding the needs. If to list the benefits of using data mining and social media: it simplifies the working processes, saves time, helps to personalize communications with customers and reach necessary audiences, however, it also worth mentioning that you can't rely 100% on data mining due to the possibility of incomplete information during the process.

7. Research conclusions

Customer satisfaction always has been one of the significant points in every business. Using data mining and social media tools, companies can analyze and identify customer satisfactions and propose ways to achieve customer expectations. The sphere of the business that we have analyzed in this paper also relates to achieving customer satisfaction using social media tools. From the analysis provided above, we can state that right targeting in social media and data gathering, and mining can describe customer needs, and helps to identify, as well as reach customer satisfaction. Using mixed research method, by performing interview on specialists from marketing department and admission department who definitely have all data regarding the educational preferences of respondents, their level of educations and possibility to study abroad; we can conclude that social media and data mining is a bridge between customers and producers.

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