

Digital Marketing for Identifying Customers' Preferences – A Solution for SMEs in Obtaining Competitive Advantages

by

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Abstract. The paper presents the Digital Marketing (DM) importance for small and medium enterprises (SMEs) from the competitive point of view, a set of existing platforms for business models that implement the use of DM and a description of some related case studies relevant at international level. The paper also proposes a framework for DM, having the main goal to identify the customers' preferences. The framework originality consists in the use of cloud computing (CC) technology and in the way the data client is collected. The framework benefits from the advantages of CC technology. Using the DM framework, the management board of an enterprise may understand better their clients' needs and behavior. By doing this, the enterprise could improve the business, gaining a competitive advantage on the market.

Key words: digital marketing, customers' preferences, cloud computing, multi-agent system

JEL classification: M31, M37, C63

1 Introduction

In recent years, one of the most significant discussions in marketing domain, is a new approach, approach that is used more and more often because of its encouraging results. It is centered on customer orientation (OC). Its positive performance is due to the development and information technology facilities that offer increasingly more support to OC approach for specific processes. Processes like data collection, data storage, data processing, analysis and dissemination. These processes are aimed to transform operative results in knowledge that can help top management in decision making, decisions that affect marketing strategies and policies within a company.

In the client-oriented approach, an important role is to identify customer preferences as it provides information about which product or service to be provided and especially regarding the manner in which they are offered. In this context, the customers' profile analysis is an essential process which is based on data availability of the company and its analysis. In the paper (Florescu et. al, 2005) consumer behavior is defined as "a multidimensional concept that covers all acts decision made at the individual or group level directly related to the

collection and use of goods and services to meet current and future needs including decision-making processes that precede and determine these acts ". According to (Karding et. al, 2011), "consumer behavior entails all consumer activities associated with the purchase, use, and disposal of goods and services, including the consumer's emotional, mental, and behavioral response that precedes cause, or follow these activities".

Identification of customer behavior in turn requires obtaining relevant data about customers, data preprocessing and processing, analysis and interpretation of results as well.

Digital Marketing is one of the main forms of marketing made possible thanks to the special support provided by current IT technologies. Digital Marketing (DM) according to Jon Orton (Director, Marketing Operations at Uponor) (Orton, 2014) is defined as being "an agile framework that integrates three basic elements that might be more internally focused: people (influencing behavior change internally while creating a compelling call-to-action or experience for the targeted audience), process (investing in continuous improvement / change management to evolve the marketing platform) and technology (disciplined approach to technology adoption)".

In terms of technology, Cloud Computing is a technology with high potential in terms of achieving digital marketing facilities because of the support that it offers. In this paper it is proposed a Cloud Computing based framework that aims to identify the customers' preferences, highlighting also the data collection approach. The paper is structured into six sections, as follows: in the *Introduction*, there have being defined and described terms like consumer behavior, marketing and digital technology Cloud Computing; in the second part, *Digital Marketing*, describes the main directions for the use of DM and the advantages and disadvantages of its use; the third part, *Digital Marketing (DM) and Cloud Computing (CC)*, describes the main three CC models and the advantages of using them in the DM; in the fourth part, *DM and CC - Case Studies and platforms*, there were described two major companies, each one with its platform for CC used for DM; in the fifth part, *Identifying Customers' preferences framework based on cloud computing technology*, a CC based framework for DM is proposed, having the main goal to identify the customers' preferences and clients' profiles. In the final part, a set of conclusion and future research directions are mentioned.

2 Digital Marketing (DM)

Digital Marketing is a special approach of the marketing activity among the other types. It makes use of the IT technology in a big way (Morrow and Chiron, 2012; Greenberg and Kates, 2013; Kaufman and Horton, 2014; Ryan, 2014).

According to Techopedia (Tech, 2015), Digital Marketing "includes rack of internet marketing techniques, such as search engine optimization (SEO), search engine marketing (SEM) and link building. Also, it extends to non-Internet channels that provide digital media, such as short messaging service (SMS), multimedia messaging service (MMS), mobile callback and on-hold ring tones, e-books, optical disks and games. A key objective is engaging digital marketing customers and allowing them to

interact with the brand through servicing and delivery of digital media."

The main directions of its use are currently promoting company products and services, generating sales, increasing visibility of advertised products/services. Compared to these directions, the main processes used are:

- Online Behavioral Advertising - activity which consists in gathering information about site visitors and targeted platforms in order to send them customized offers according to their preferences (Code 2015).
- Influencer marketing - used to identify and influence the opinions of those consumers with influence over the other, accessing certain sites or platforms that can in turn influence the good/services selecting process of other potential buyers (Wong, 2015);
- Collaborative environment - creating collaborative environments to help organizations interconnection in order to optimize the use and reuse of resources, access to data and information. Cloud Computing technology can offer a number of solutions in this regard.

In Figure 1 are mentioned the main issues that make easier achieving one of the main goals of digital marketing, this means to identify clients' preferences based on data which the company holds about them.

Other processes consist of email marketing, optimizing the websites to appear better positioned in the results returned by search engines, and to improve the use of social networks to promote products/services.

The main advantages of DM are:

- the use of the latest technologies allows software platform for all mobile devices that targeted customers may have, to receive offers about products or services that might interest them
- creating a direct connection with customers;
- less allocated resources for sites and advertisements designed for mobile devices;
- an efficient resource use for collaborative environments were the use of DM desired;

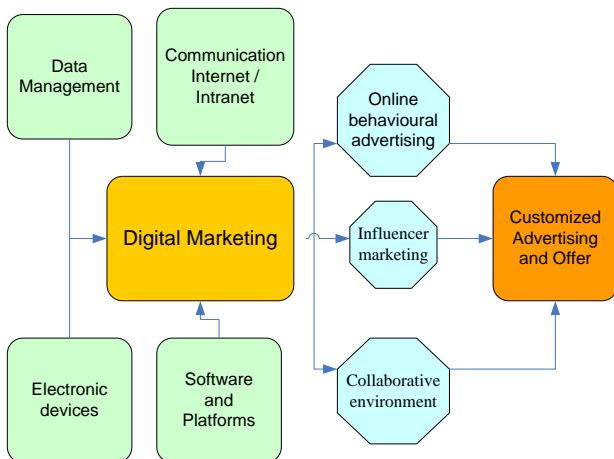


Figure 1. Digital Marketing aspects

- the ease of goods purchase becomes important when data store process is useful when the customer is using a an electronic device with internet access, because customer related data is easier to obtain. This process contributes to data collection that can be used later to profiling him and in identification of its preferences;
- provides facility to easier measure advertising if the commercials really get to the customers, I they have consulted them and, eventually, the time spent over an offer.

Among disadvantages we can mention:

- the approach may be considered intrusive in some cases in terms of customer violation intimacy;
- mobile device type must be considered, in terms of software, screen resolution, performances, access rights to the sites;
- large companies may allocate a larger budget to specific activities of data analysis to obtain profiles of clients (egg. greater investment in hardware, more specialists to process data and obtain results, investments in intelligent software sites , etc.);
- limited degree of internet access or local intranets and broadband (traffic speed). In general, at the international level, the highest percentage of number of people who have internet access is in the United States (81%) followed by Europe (78%). In other

parts of the world, the percent is below 50% (Figure 2).

Although dependent on the internet, digital marketing can improve a number of specific issues using the technology of Cloud Computing. It offers a number of features that can eliminate the differences between large companies and small/medium ones offering the possibility of the latter to be more competitive on the market.

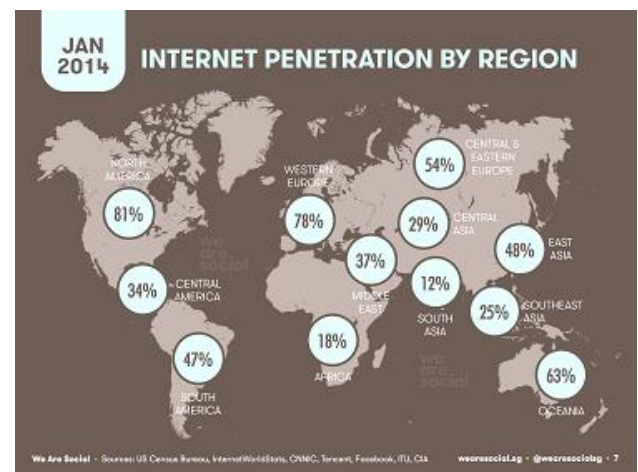


Figure 2. Internet penetration in the world

Source: <http://wearesocial.net/blog/2014/01/social-digital-mobile-worldwide-2014/>

One aspect on which attention is drawn in the paper (Lee, 2014) is that customers become suspicious when they are receiving an offer highly customized, believing that it entails and customization costs. It is therefore recommended that an offer to be made to a group of clients with similar expectations.

3 Digital Marketing and Cloud Computing

The concept of Cloud Computing is a relatively recent one, occurring in the IT vocabulary eight years ago. It is sustained by the service oriented paradigm. In works like (Kavis, 2014; Erl and Puttin, 2013; Bahgat and Madisetti, 2013) is debated this topic. Services that are in the network cloud can be accessed from any device that has internet or intranet connection, depending on the cloud's properties. In essence, Cloud Computing is a set of distributed computing services, software, and data storage and backup for creating them (usually

surcharge), elements that can be accessed regardless of where the user is located geographically.

Therefore, Cloud Computing technology offers clients a large range of physical and virtual resources, which the user can consume as needs them and paying exactly how much he has consumed. From a user/company perspective they seem limitless, being distributed in order to serve all the customers.

The three main models offered by CC are: Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) (Coyne et al., 2014).

SaaS model – it is assumed that the cloud network owner has installed software and applications on powerful computers and servers. It gives access to them to users/customers who will use them through a web interface to connect from any device they use connected to internet (Chappell, D., 2008). Examples of companies that use infrastructure services: Salesforce, Workaday.

PaaS model – the cloud provider allows to clients to design their own software applications using cloud infrastructure as well as having control over them. Examples of companies that offer this model are Force.com, Amazon Web Services and Microsoft Windows Azure.

IaaS model - the model is characterized by the fact that users can install or run their own operating system or application using the infrastructure provided by the supplier. Supplier shall provide the client storage resources, processing, network elements and all that resources that client might need. An example of such a service is offered by the company Amazon (Amazon EC2).

CC technology we can say that although is not a mature technology, is currently pretty much used by companies around the world, integrated in business planning and model. The main advantage that digital marketing has based on CC technology is the one that concerns the storage and data processing and analysis necessary in order to obtain its customer profile and to identify their preferences. This has a big influence over the all components of a marketing plan (advertising, publicity, strategy,

pricing, sales promotion, brand identification, research sales, direct marketing, product placement, market research). In the paper (Patel and Gohilu, 2014) there are mentioned some of the most important aspects of the Cloud Computing useful for Digital Marketing with a big impact as follows:

- a) storing data of the user in the cloud is the future solution for large companies and for medium and small ones. Forbes predictions companies like Cisco and Gartner indicates that one third of digital content will be stored in the cloud until 2016, given that in 2011 the percent was 7%.
- b) In terms of storage average capacity for a user, it will increase from approx. 0.5 terabytes in 2011 to 3.3 terabytes in 2016. Financial Cloud technology services market is estimated to grow to \$40.7B as it was listed in 2011 at approx. \$ 240 billion in 2020. It is also estimated that by 2020 users to quit using local programs and applications installed on their computers in favor of web-based applications offered in the cloud. This will largely be due to the financial reasons and will force companies to extent migration to cloud.
- c) reaching to the clients or to potential clients - one of the MD aims is to reach the customer in as many ways to present and/or promote the products or services. In this case, CC technology can offer a number of solutions. For example, a potential customer who watch TV and write a message sitting in armchair normally would not be affected by digital marketing. CC technology makes it possible for a person, his data to be accessed via phone or TV without leaving the room. This is possible because the telephone and television services may be part of the same services cloud network that can communicate with each other.

4 DM and CC - Case studies and platforms

- a) IBM SmartCloud for Smarter Commerce – an all-in-one platform. It offers two major kinds of solutions (IBM, 2015):

▪ *Smarter Commerce: Customer Engagement Solutions* – offers solutions also for channels and e-Commerce responsible for enabling targeted and personalized marketing and seamless cross-channel customer experiences and also for sales. Some aspects of this category are: Real-time personalization, Customer Engagement (B2B and B2C Commerce Models), Customer experience management, Digital marketing optimization, Omni-channel Marketing, Omni-channel merchandise optimization, Customer analytics, Customer experience suite, Customer experience management.

For example, IBM real-time personalization solutions, according to (IBM, 2015), “can help an organization to turn individual customer interactions into an opportunity for personalized, relevant engagement”. Real-time personalization solutions enable organizations to better understand each client behavior. By doing that, some recommendation might be offered regarding the desired products or services, customized offers, the impact of the commercial over the customer behavior.

▪ *Smarter Commerce: Partner and Supplier Engagement Solutions* – offers solutions for B2B integration and secure exchange of corporate data, executives in procurement, supply chain and IT responsible for enabling adaptive procurement and an optimized supply chain. Some aspects of this category are: Enterprise and category spend management, B2B integrations and collaboration, Supply chain management, Source to contract, Supplier management, risk and compliance, Managed file transfer, Aspera file sharing suite.

b) Microsoft Azure – platform offered by Microsoft. It offers complex solutions for DM (Azure, 2015). Among the most popular solutions that this platform offers are: Web Sites and Web Hosting, Virtual machines, SQL Databases, Machines learning, Mobile BackEnds Services (allows you to build IOS, Android and Windows applications), Remote application (it brings scale, agility and global access to a business applications). Among the clients that are

using Azure we can mention: NBC Sports, Mazda, 3M, Xerox, AccuWeather.

5 Identifying customers’ preferences framework based on Cloud Computing technology

In this section we propose a framework based on cloud computing technology which aims to identify customer preferences and profiles to achieve their digital marketing. To achieve this process, it is required to obtain a data collection, data storage and analysis and the interpretation of the results as well. The data collected can cover many information categories related to consumers, namely, data on demographic information, personal actions taken by the consumer, about the products and services purchased, etc. Also it can be selected information regarding visited websites, in internet pages areas where mouse click are made, time spent on which website page. Given the huge amount of data stored via the Cloud Computing technology (which is not a problem for small and medium companies due to the facility of accessing data stored in the cloud network) must be carefully determined what data will be used. For example, data can be used for email campaigns, direct marketing, social networks, telemarketing, etc.

Another important aspect that contributes to the process of data analysis is the amount of data that is used in the analysis process. That is why a central database is necessary which can manage all the data that can be obtained through electronic devices from consumers.

In this case the database is provided as a service cloud infrastructure. An advantage may be the service that can offer data facilities for data acquisition, data storage, processing, analysis and their interpretation in order to obtain customer profiles and to identify their preferences. This will be very helpful in order to generate and send personalized offers to them or consumer groups with similar behavior among members.

Using such kind of information, a set of measures regarding the results of the impact on consumers in terms of offers received,

advertisements and promotions made in digital marketing as well may be achieved. Figure 3 presents the high-level architecture framework proposed site.

The proposed framework aims the customer that uses electronic devices with internet access. Using these devices, the customer (which can become consumer) will access various websites for consultation or even to purchase products and/or services.

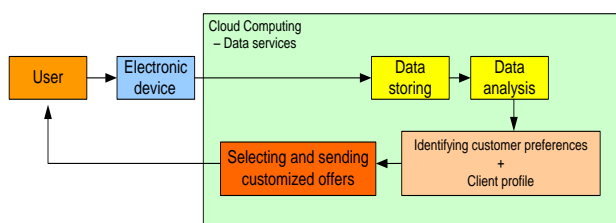


Figure 3. High – level architecture for the proposed framework

After accessing a site that requires a new account, all information will be introduced to create the account records in a database related to that site, located in the cloud database. Also, after logging in, all information on that user activity will be recorded (for example, pages viewed, number of clicks on a category of products, the time spent to on a web page, etc.). Once data are stored, they are analyzed and, based on it, using an intelligent data analysis technique (egg. data mining technique) it can be identified some of the future consumer preferences, and to create customer profiles. As there is more information about the consumer in the central database, the profile will be more accurate by using amore attributes in the data analysis. Once a profile is selected, it can be identified consumers fitting this profile and through various digital marketing techniques they receive customized offers.

In Figure 4 is shown a detailed architecture for the proposed model based on cloud computing and it is described below.

The user who uses electronic devices such as mobile phones with different operating systems (iOS, Android, Windows), laptops, tablets, desktops can access via the Internet or intranet applications, programs, platforms or other services provided by the companies. All these

services are provided within the network cloud. The entire activity performed by the user can be monitored and relevant information can be stored in the primary database. All these databases, being in the cloud, can easily communicate with a central database containing all the information about a customer. The central database will be able to use a special service to update new information stored in the primary database. To optimize updating data process in the central database is recommended to use a multi-agent system to reduce the network traffic by collecting only relevant new information.

Base location of the software agents belonging to the multi-agent system will be represented by the central server used for data collection that holds the central database. An aim of an agent is to visit the location of a primary database and to extract relevant information. Then, it returns to the base location updating it with information collected. Using this solution, network data traffic is reduced because all the new information is sent from the primary database to the central database while being carried by the mobile agent.

Otherwise, it would take that with each update of the primary database to be sent to the central database, which would generate high data traffic.

In the central server there will be a suite of programs and software that will facilitate data analysis (Data Analysis Modules like Business Intelligence Module), that make use of data mining techniques. After analyzing the data, it can obtain information about customer profiles and their preferences.

Clustering algorithms (such SimpleKMeans, EM, Farthest First, Filtered Clusterer, Hierarchical Clusterer) and classification (such as J48, Id3, NBTree, RepTree, SimpleCart) provides encouraging results in this. Based on the profiles identified, customized offers can be created for products and / or services. Because the system already offers at least one way to reach the consumer (egg. by email, accounts created on different platforms, by registration required to use certain applications) digital

marketing can be done in a proper manner that will have a big impact over the consumer.

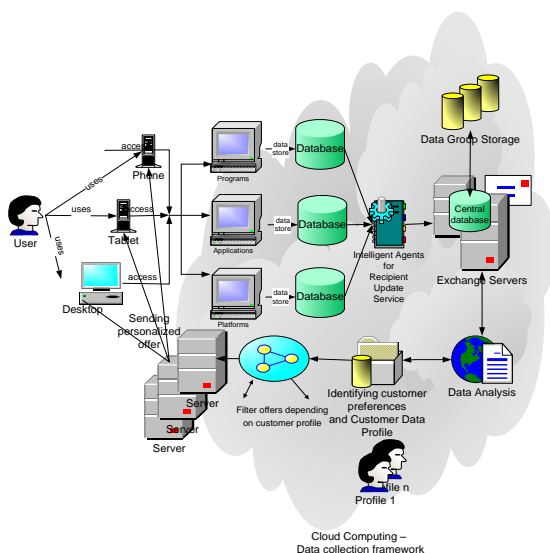


Figure 4. A detailed architecture for the proposed cloud computing based framework

The advantages of this model based on Cloud technology Computing are:

- a decreased amount of network traffic due to the use of intelligent technologies respective, agent oriented technology;
- easy communication between data sources thanks to the compatibility between them, their compatibility is assured by the network cloud.
- data storage from various sources which occupies a large space. Large amount of data is needed to achieve more accurate customer profile and preferences;
- low cost from companies that use cloud services, such as for example the one that are using services for data storage and analysis
- lower resource consumption by companies in order to get the results;
- it is possible that all data of a digital marketing campaigns (input data, results, impact on consumers) to be stored and compared against subsequent campaigns.

The limitations of the proposed framework are:

- Type of services provided by cloud service providers and performance that characterizes them;

- in order to retrieve information about a consumer, it is necessary to offer their data by creating an account by registering it;
- taking data regarding a client without an agreement of his side and only making use of the available infrastructure.

6 Conclusions

In this paper was presented a Cloud Computing based technology approach regarding how technology may help achieve digital marketing goal by showing how it may collect, store and analyze data in order to identify consumer preferences and their profiles. The framework proposed aims to highlight the facilities provided for those operations under CC technology using to collect data from primary databases and send them to a central database using agent-oriented technology. For the proposed framework are mentioned also the advantages and disadvantages.

The proposed solution offers benefits both consumers and companies, companies that want to achieve great impact with their marketing campaigns but also want a resource consumption optimization. Using multi-agent technology to collect data in the Cloud Computing technology is a solution that delivers good results. In the following years, the phrase "move to the cloud" will become a reality for many companies currently operating after the classic way. CC migration is, according to the IT specialists and not only, the direction that will greatly reduce the competitive advantage that large companies have in front of medium-sized and small. Because of its particularities, digital marketing will be that part of the marketing domain that will benefit most from CC technology.

Marketers need to understand better the benefits that cloud computing technology offers so that they can enjoy all the benefits that it offers. In this regard, it takes special training and adaptation in understanding how the Internet and writing code for advertisements and offers must be written and promoted. With the use of technology CC, storage data space and analysis, the submitting of the

customized offers based on customer preferences seem to be easier. Therefore, developing and distributing promotional materials will have to grow both quantitatively and qualitatively. Also, in the near future, will have to be a major customization in Digital Marketing based on the way in which the customer is using his devices.

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