The New Approach to Internet Marketing Based on Knowledge Bases and the Semantic Web

Srđan Jovanović[1], Snježana Đokić[2], Mladen Radivojević[3]

[1]"Fond za penziono i invalidsko osiguranje Republike Srpske", Prijedor, Bosnia and Herzegovina

[2,3]ITEP, Banja Luka, Bosnia and Herzegovina

Abstract

In this paper, we deal with the application of the new technological knowledge, in the faster reaching the necessary knowledge on the application of Internet marketing. We suggest the use of the semantic web and knowledge bases for the faster reaching to the necessary knowledge to all those who deal with Internet marketing and the promotion of the products or services. For updating only a part of the knowledge, we use Protégé editor, an open source platform. It enables update to the users and very fast reach to the introduced knowledge. In the paper, we deal with the Internet and its possibilities in more efficient and cheaper marketing. Due to the fact that Internet marketing is a very complex process, it is required corresponding knowledge in order to be efficiently used in presenting the products or services to the potential buyers or users. We suggest new technological solution based on the semantic web, for simpler reaching to the necessary knowledge. The aim of the paper is not updating of the knowledge base completely , but only presenting new and unique concept of reaching it.

Keywords: Internet, Marketing, Knowledge bases, Semantic web**.**

1. INTRODUCTION

We live in the world of digital economy and we do not know where it is going to lead us, but we certainly know that that process is irreversible and that there is no going back. No matter how much someone liked it, the fear of new must be overcomed and accept the changes and try to draw from them as much as possible.

Internet is a network of two to an infinitely many computers and computer networks which can exchange data and information and to react as a unique system. It enables the users more efficient work and faster reach to necessary data and information. The whole world is more quickly involving in its virtual community. It is created one completely new global market environment under its wing, which does not have physical boundaries and opens a completely new path to the marketing.

An encreasing number of people is spending an increasing amount of time on the Internet, so it obtains also a certain place in making decisions on selling or buying. A great number of business systems significantly invest in its Internet performance (marketing) in order to get closer to the potential buyer and to present him its product.

Thanks to its capabilities, the Internet is becoming the most significant media for new marketing strategies, different forms of trade, and the improvement of all relations betweent the product and service business systems with the consumers or service users.

Internet enables a new manner of reaching to new buyers and more efficient and effective cooperation with the existing. It enables a more efficient presenting of the products, market research and monitoring developments on it and the work of the competition and similar. It is a very powerful mean for efficient serving of consumers and providing of strategic marketing purposes of the business system.

The Internet can be applied as an integral part of the contemporary marketing concept considering:[1]

- It provides a support to the whole series of organizational functions and processess,
- It represents a powerful media of communication,
- It facilititates the management of information.

2. KNOWLEDGE BASES AND SEMANTIC WEB[2]

The concept of the semantic Web was introduced by Tim Berners Lee (2001) as a clear structure to the content of the Web page.

---

[1] JOBBER D., „Osnovi marketinga", Data status, Beograd, 2006,
[2] Kuleto, V., Subotić, N., Radivojević, M., The new approach in observing electronic-digital money based on knowledgebases and semantic web,International Journal of Research in Management, Engineering, IT and Social Sciences, Volume 5 Issue 11, str. 21 - 40, ISSN 2250-0588, november, 2015.

It has emerged in the quest for more efficient solutions for finding information and also as new extension of the World Wide Web and it enables better cooperation between the users and the computers.[1]

It is based on the idea that the information on the web becomes more machine readable. Instead of documents connected with hyperlinks it should use interconnected data (information) that have a specified structure and meaning.

It will allow computers to find, understand and use the information via the web in order to achieve certain goals. It covers a lot of different areas and there must be a few people that have completely the same idea of the semantic web. According to the Passin (2004), it can be identified topics which are most frequently used in connection with it (Thomas., B., 2007):

- Indexing and access to information – for the purpose of finding information, the access of the semantic web should go further from the indexing of the key words and alphabetic indexing.
- Metadata – used during the search and finding the information
- Annotation – adding information on the existing document available on the web without the modification of the original document.
- Machine collecting of data – software itself determines which data are needed and how to get them and afterwards software itself takes them.
- Discovering the service – services must be found, discover what they do and how to invite them.
- Intelligent software agents – someone or something that acts in the user's name.

In order that the idea of the semantic web functions, the computers would have to have access to the collections of information. It has to provide the rules for reasoning about the data and to allow the presentation of data, information and knowledge.

In this paper, we use Protégé editor, an open source platform for updating part of the necessary knowledge related to Internet marketing and which allows users to: read and store knowledge and update and visualize classes. It allows the display the meanings of terms and relations among those terms. It provides a rich set of modeling structures and activities that support the creation,

visualization and manipulation of knowledge that are represented in different formats.

3. INTERNET MARKETING

With the publishing of the first Web page on the Internet, it has become clear that the new market has appeared where the business systems will be able to promote their products and services and each of the consumers will be able to find everything that he needs. In those first days, a few people could assume such rapid development of the new market and almost neglect the traditional.Internet market leads to the important changes in the commerce and supply and the most important are:

- A much bigger number of information,
- Lower costs of searching of products or service,
- Possibility that the potential buyer and actual seller does not have to be on the same location and similar.

The first phase of starting business on the Internet is the creation of the Web page that enables much more then the traditional marketing, and that is :

- A large number of products and information on those products on one place,
- Possibility of choice and faster purchase,
- Understanding what the buyers wrote on the given product,
- Direct and fast communication,
- Availability of the Web page to all people and similar[2].

The phenomenon of Internet has enabled a significant growth of efficiency and effectiveness of the operations of the business system and thits infrastructure is a suitable medium for diferrent marketing strategies.

Internet marketing represents a fulfilling of the marketing goals through the use of the Internet and the Internet based technologies. [3] . The usage of Internet marketing and traditional marketing channels should enable to the business system a development of the longterm relationships with the present and potential buyers. It represents a corresponding set of techniques, tools and strategies for the support of realizing of the marketing goals of the business systems, where the Internet is used as the reliable communication channel.Internet also enables a creative and technical aspect and in its efficient use should be thought about design, development and advertising in

[1] Walton, Christopher D. Agency and the Semantic Web. New York, Oxford University Press, 2007.

[2] ŠAPIC D., „Marketing na Internetu", Beograd, 2002, str. 163-173

[3] VASILJEV S., „Marketing", Prometej, Novi Sad, 2005,

the full sense of the word. Internet marketing is the sum of the activities which are used in the purpose of directing of the flow of the products and services from the production business system to the buyer (consumer) or the service user. In literature, beside the name Internet marketing are also used the terms e-Marketing, Cyber marketing, Virtual marketing, Online marketing, Interactive marketing and similar.

Internet marketing represents contemporary marketing business phylosophy which with the use of the Internet achieves a different communication between the production business system and the consumer, based on different principles and mutual relations.

Mass marketing includes a large number of consumers of the certain product with the application of the corresponding mass media. New marketing concept has abandoned an old production oriented phylosophy and represented a different marketing concept and business politics oriented towards the consumer and the satisfaction of his needs.Earlier, the goal of advertising was in the thing to include as wider circle of consumers as it can and now, in Internet marketing the attention is moved from the mass to the personalized advertising „one on one"marketing. Personalized marketing means directing the attention on the certain buyer to which the product or service is adapted. Such concept dwells on the assumption that only mutual benefits can lead to loyalty towards the certain products. This personalized-*directed marketing* means corresponding selection of the potential buyers or service users and to whom the product or service is adjusted.

Classical (mass) marketing is focused on: anonymous buyer (consumer), standard product, mass production, mass distribution and propaganda, one way messages, economy of volume and attracting consumers, while the personalized marketing is focused on : individual consumer of the certain profile, offer and the product adjusted to the buyer's needs, personal distribution and propaganda, two way communication and customers' retention.

We shall use Protégé editor for updating part of the knowledge which relate to the classical and personalized marketing (Figure 1).
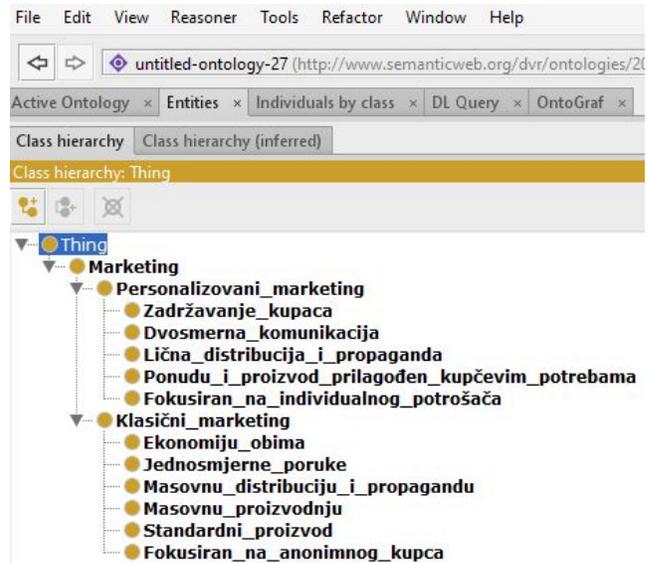

Fig. 1 Classical and personalized marketing

With the use of Internet, consumers and service users become active, search for information on business systems, their products or services and initiate contacts. In such interactive relation with the business systems, they become "creators" of the product prior to their purchase.

The basic question of Internet marketing, as with classical marketing is the profitability. That is why it must be well tracked the relation between the costs of the campaign and the achieved business profit. Tracking down the marketing costs at the "virtual" market is not an easy or simple process. We should bear in mind that there is great number of efficient and reliable methods by which it could assessed and tracked the cost of Internet marketing.

Internet marketing is a new form of conducting marketing activities and enables to the business system a very quick path for reaching the potential buyer. Internet market becomes a new place of the encounter of supply and demand.

In order to be able to quickly and efficiently reach to the necessary knowledge on Internet marketing, first we have to know which knowledge is necessary to us and that knowledge introduce in the knowledge base. In this paper, for updating of the knowledge base, we use Protégé editor, an open source platform and we will update only a part of the necessary knowledge. In this paper we observe only a part of the knowledge which relates to:
• Possibility of precise determining of the target group,
• Greater efficiency and effectiveness in the field of costs and invested time,
• Selection of corresponding platform for advertising

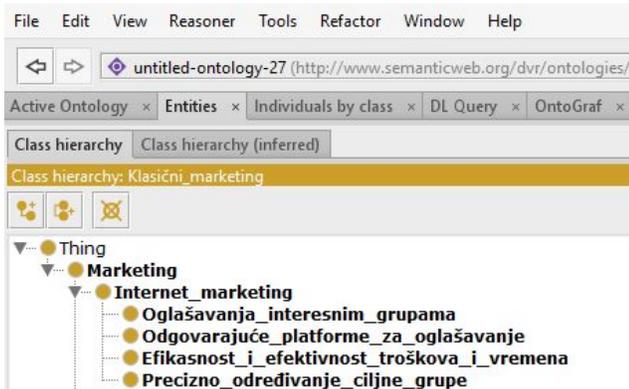- Possibility of certain advertising to the interest groups.

Fig. 2 Possibilities of Internet marketing

We should bear in mind that the skills and knowledge along with e-m-Business and Internet marketing are the future skills and knowledge.

4. PRESENTATION ON THE INTERNET

Those who deal with web page design, they think that it should be more responsive and simpler. It is necessary to provide such navigation that the user with three clicks at most can reach to the desired information. Due to the fact that Internet is a global network, we should bear in mind that the page could be reached by users from any country of the world. Business systems should consider translating the page into different languages. If through the Web page is conducted the sale of the product, it would be desirable to possess virtual shooping basket, and also several modes of ordering and payment[1].

The purpose of the web page for the largest number of business systems is the same and that is to attract as big number of the potential buyers or service users as it can. In order that the web page would be a successful recommendation, it is to be used concept "7C" that includes:[2].

- Context – how the web page is organized, functionality and aesthetics,
- Content – what the page offers to the users,

---

[1] Šapić D., „E-commerce: poslovanje preko Interneta", Beograd, 2004, str. 51-53
[2] XU LI, A. MIN TJOA, CHAUDHRY S., „Research and Practical Issues of Enterprise Information System II", International Federation of Information Processing, USA, 2008, str. 849

- Community – how interactive communication is enabled,
- Customatization – ability of the page to adapt to individual users.
- Communication – how the page enables communication between itself and the user.
- Connection – how the page is connected with the other web pages,
- Commerce – ability of the page to enable shopping and safe transactions.

By using Protégé editor, we have updated part of the necessary knowledge which define a successful web page (Figure 3)
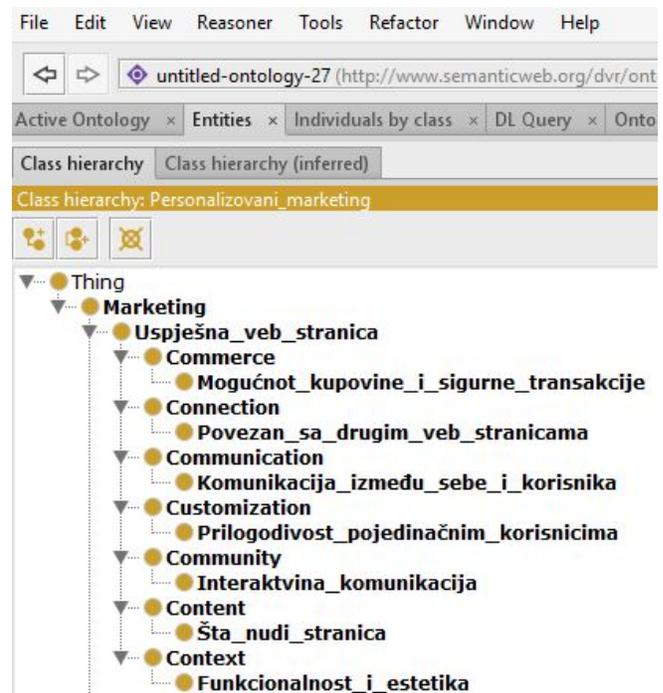

Fig. 3 Successful web page

In order to successfully operate on the Internet, besides a good design of the web page, it is necessary to know the buyers who purchase goods over the Internet. That is why it must be collected information on the needs, desires, wishes and habits of the buyers, in order to be able to efficiently do business at the new market, with the adequate Internet marketing strategy. It must be known what the potential buyers expect of the business system and to offer them the same. We should always bear in mind that the expectations of the buyers are different and that during the purchase there are those who only look at the price, as well as those to whom the easiness of the access is the most important.

With the use of Protégé editor, we will represent also the part of the necessary knowledge with the successful business on the Internet (Figure 4).
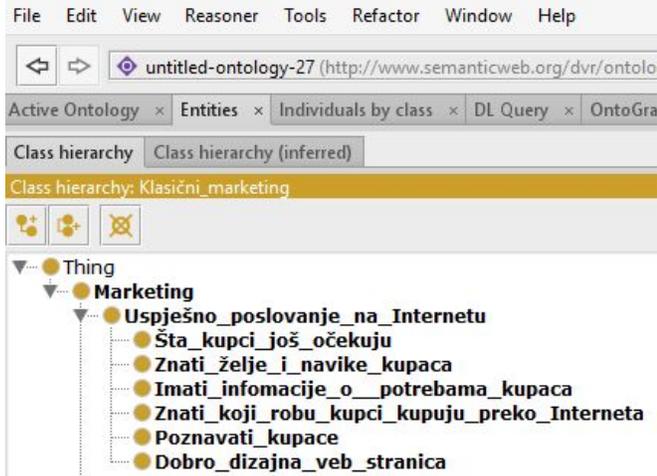

Fig. 4 Successful businesses on the Internet

On the fact whether they are going to buy on the new market there are several different factors:
- Individual characteristics of the buyer,
- Environment
- Characteristics of the product/service,
- Characteristics of the media and
- Characteristics of the commerce and mediator.

All that should be kept in mind, due to the fact it is about the personalized marketing, where the business system adapts its offer to the certain buyer, and that different buyers are treated in different ways.

Marketing on the social networks has become more serious than ever and this is not something what somebody could do in his free time and according to the principles that he likes. It is sure that somebody with little knowledge and experience directs web page of Coca Cola or manages its marketing activities. The same should be in the big but also in the small business system. If somebody wants to be a big business system, they must think of the big. We must bear in mind that "Correct marketing does not work by the personal feeling." Tools, techniques and skills related to digital marketing have been developed through the large number of research and case studies. In order to succeed, one must be better than the competition, to be better and always even better.

Properly done marketing strategy must be focused on creating a profile and establishing long term cooperation with the buyers and business partners. Marketing presence

of the business system on the Internet is most often directed at:
- Promoting the products and services,
- Reducing the costs for marketing,
- Conquering of the new markets,
- Improvement of the relations with the business partners and the buyers, and
- Modernization of business.

Internet as a new and a very efficient media allows the same.

5. MARKETING PERFORMANCE ON THE INTERNET

In order that the business system could successfully do business on the Internet, it must create a plan of its performance, determine the way and manner of reaching to the set marketing goals. The plan should define necessary steps which need to be taken in order to be achieved the desired goal. It is a guiding line and a reminder on the important steps which needs to be taken. Good marketing planning can bring business system closer to the marked goals. During time, plans should be changed in accordance with all the changes that are occurring in the environment.

Good marketing plan demands at least the following steps: analysis of the state and the assessment of the possibilities, defining of the target group, setting the marketing goals, defining the strategies, action plan, creation of the budget and the control and evaluation of the plan.[1]

Analysis of the state and the assessment of the possibilities – it implies a detailed analysis of the environment in which the business system acts. It must be known economic environment, political and legal environment, technological environment and the social and cultural environment. Especially the competitors must be well known: their status, possibilities and position on the market.

Defining of the target group – it is necessary to define a target group to which the products or the service will be intended. Business system can direct its business to the certain buyers, investors, internal staff, business partners and others. To whom the product or the service will be intended depends on the type of the product or service which is offered, their characteristics, functions and purposes.

---

[1] STRAUSS J., FROST R., „Marketing on the Internet", Prentice Hall, 1999, str. 300

Setting the marketing goals – after considering of their own possibilities, business system can set their goals, that is, states or results, which are desired to be achieved. It is a guiding star which determines the direction of business of the business system. At the Internet marketing, as the goal is determined the increase of the volume of sale.

Defining the marketing strategy – is a very responsible and complex process, due to the fact that from the set strategy depends how much the business system is going to be successful in realization. Badly done and implemented strategy can lead to the loss of the buyers, falling of the sale and weakening of the market position.

Action plan – it is necessary to define concrete activities which are necessary to be conducted in order that the marketing plan is successfully realized. Part of those activities is related on the design of the Internet page, wherein the business system can rely on its own design and save on costs or entrust it to the designer house and there increase the costs   and   secure more quality and faster design.

Creation of the budget – in order that the business system would launch the Internet campaign it has to predict certain funds. Those costs will be tied to the covering of the costs of the Internet service provider, corresponding hardware and software, design and maintaining of the web page and similar. By analyzing the costs and profit it can be reached to the looking in the financial justification/unjustification of taking over of such marketing step.

Control and evaluation of the marketing plan – in order for the business system could look into the state in the realization of its marketing plan, it has to conduct a control of the set goals. The most important activities of the control are related to selling, distribution and promotion. For this kind of control are now used the corresponding software tools. If some mistakes or oversights eventually happen, they need to work harder on their removal. For evaluation of the marketing activities it is usually used online research of the buyers' opinions, web page visits, visitor retention time on the page and similar.

On Figure 5 is been given OntoGraf of the Marketing plan created on the basis of updating of the knowledge base some of the necessary knowledge for planning the marketing.

6. CONCLUSION

In this paper, we have dealt with the application of the new technological knowledge in the faster reach to the necessary knowledge on the application of Internet marketing. We have suggested the use of knowledge bases for the faster reach to the necessary knowledge related to Internet marketing. We have updated only a part of knowledge with the use of Protégé editor. It enables updating and very quickly reaching to the introduced knowledge. We have suggested one original solution for quick reach to necessary knowledge on Internet marketing. The goal has not been a completely updating of the knowledge base but only the representation of a new and unique concept of reaching it.
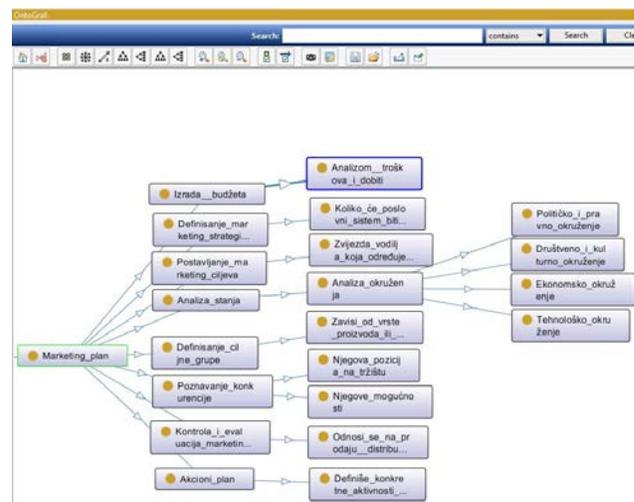

Fig. 5 OntoGraf of the Marketing plan

REFERENCES

[1] JOBBER D., „Osnovi marketinga", Data status, Beograd, 2006,

[2] Walton, Christopher D. Agency and the Semantic Web. New York, Oxford University Press, 2007.

[3] Kuleto, V., Subotić, N., Radivojević, M., The new approach in observing electronic-digital money based on knowledgebases and semantic web,International Journal of Research in Management, Engineering, IT and Social Sciences, Volume 5 Issue 11, str. 21 - 40, ISSN 2250-0588, november, 2015.

[4] ŠAPIC D., „Marketing na Internetu", Beograd, 2002, str. 163-173

[5] VASILJEV S., „Marketing", Prometej, Novi Sad, 2005,

[6] Šapić D., „E-commerce: poslovanje preko Interneta", Beograd, 2004, str. 51-53

[7] XU LI, A. MIN TJOA, CHAUDHRY S., „Research and Practical Issues of Enterprise Information System II", International Federation of Information Processing, USA, 2008, str. 849

[8] STRAUSS J., FROST R., „Marketing on the Internet", Prentice Hall, 1999, str. 300