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## Using semantic web for faster obtaining of necessary marketing knowledge in the creation and launch of new products

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### Abstract

In this paper we propose the use of Semantic Web and Knowledge Base for faster obtaining of necessary knowledge for all those who are engaged in the marketing and promotion of new products. To update a part of the knowledge we use the editor Protégé, an open source platform that allows users to update and quickly obtain entered knowledge. We are addressing steps in the development of new products and position of marketing in each of these steps. Since the development and launch of new products is very complex process, it requires the appropriate knowledge for it to be produced and adequately presented to potential buyers. For easier obtaining of necessary knowledge we suggest a new technological solution based on the Semantic Web. The aim of this paper is not to completely update the knowledge base but only to present a new and unique concept of obtaining it.

**Keywords:** marketing, new product, Semantic Web, Knowledge Base

### Introduction

Marketing is a social and management process by which, through creation of offer and exchanging products of value with others, individuals and groups obtain what they need or what they want (Kotler, Ph., 1995). Marketing needs to meet the needs of consumers, but also the business system.

Marketing is the acquisition process of customers, products and services in sufficient number and fast enough so the business system could profitably and successfully work and perform business (Bangs, D., 1994). Good marketing requires a professional and consistent performance of a large number of small operations, while successful marketing requires that we also have good products and services, while we better than our competition know our current and potential customers.

Sale is only one of the elements of marketing, and marketing activities begin prior to production itself, and even before the design of product. This is because the marketing concept is focused on the consumer. The mere implementation of the marketing concept into practice proved to be quite difficult, although many business systems embraced the concept of marketing and defined the purpose of their job as acquiring and keeping satisfied customers. For this reason they accepted the market orientation where some problems with the implementation of marketing were included in the concept of total quality management.

The concept of market orientation of the business system is focused on continuous collection of information about the needs of customers, activities and capabilities of the competitors, and the exchange of such information throughout the business system in order to create the appropriate value for the customer. Transition to market orientation moved from the interest of manufacturer to the interest the buyer (consumer). If there are not enough customers, all other qualities of products and services, even if technologically perfect, will not bring anything. One should find a sufficient number of customers who will pay enough so that the sales can bring profit.

Supply and demand of products has never been greater than it is today. Every year appears more than 16.000 of new products and they are presented to prospective buyers. According to the research, more than 75% of them are currently failing in market positioning. Over time, market competitiveness is not reached by 15% of all new products, and only 10% of new products are accepted, and for business systems that have designed, developed and qualified them, they provide continuous income from sales (Kotler, P., 2008).

Due to this ratio: development, design and promotion of new products generate significant operating costs, with the risk that the largest number of new products do not achieve market success. It is therefore essential to devote significant attention to the planning of the new product and its promotion. In this work we present a different approach to gaining the necessary knowledge for the planning of new products and its effective promotion.

### Knowledge Bases and Semantic Web<sup>1</sup>

The term Semantic Web was introduced by Tim Berners-Lee (2001) as a clear structure of Web page content.

It originated in the search for more efficient solutions for finding information, and as a new extension of the World Wide Web, which allows better cooperation between the user and the computer (Walton, Christopher D. 2007).

It is based on the idea that information on the web should become machine readable. Instead of documents linked by hyperlinks, it should use interconnected data (information) that have a specified structure and meaning.

It will allow the computers to find, understand and use the data (information) over the web in order to achieve certain goals. It covers a lot of different areas and there must be only a few people who have exactly the same idea of the Semantic Web. According to Passin (2004), one can identify topics that are commonly used in connection with them (Thomas., B., 2007):

- Indexing and access to information - in order to find information, access of semantic web should go beyond indexing keywords and alphabetic indexing.
- Meta data - used when searching and finding information
- Annotation - add information to an existing document available on the Web, without changing the original document.
- Automated data collection - the software itself determines which of the data is needed and how to gain them, and then it collects them.
- Service Discovery - services are to be found, discover what they are doing, and how to call them.
- Intelligent software agents - someone or something that works in the user's name.

In order for an idea of Semantic Web to function, computers should have access to collections of information. It must ensure the rules for reasoning about data, and allow for the presentation of data, information and knowledge.

In this paper we use the editor Protégé, open source platform for the update of part of the necessary knowledge, which allows users to: read and store knowledge, and update and visualize classes. It allows displaying the meaning of terms and relationships among these terms. It provides a rich set of structures for modeling and activities that support the creation, visualization and manipulation of knowledge that are represented in a variety of formats.

### Product Planning

<sup>1</sup> Kuleto, V., Subotić, N., Radivojević, M., The new approach in observing electronic-digital money based on knowledge bases and semantic web, International Journal of Research in Management, Engineering, IT and Social Sciences, Volume 5 Issue 11, pg. 21 - 40, ISSN 2250-0588, November, 2015.

Product planning is a very responsible job, requires a lot of time, money and other resources, and brings a lot of uncertainty in the realization of set plan. This uncertainty is a risk assumed by the operating system in the creation and production of quality products. Will it achieve the necessary profits as a reward for the effort?

Planning entails preparation of decisions about what will be done in the future, and involves current thinking about later decision making. Product planning is the basis of development path, and it implies a decision whether to start with development activities or not (Keller, K. L., 2008). Product planning should begin well before the development project is formally approved, before resources are allocated to development, but also before one creates a development team. The goal of product planning is to ensure that development projects are in line with the business strategy of the business system.

The planning process of the new product includes:

- analysis of the situation
- setting goals
- identification, evaluation and selection of alternatives
- formulation of feasibility plans
- Budgeting.

Let us use Protégé editor to update the part of knowledge for the process of new product planning (Figure 1)

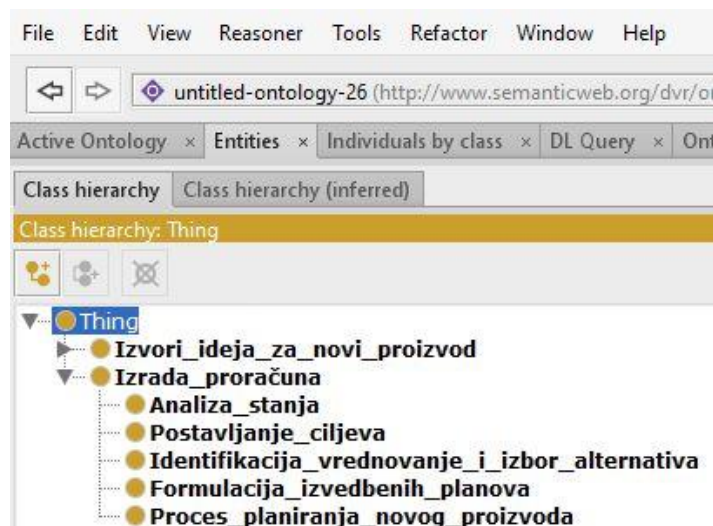


Fig 1: New product planning process

Here under the product we mean tangible and intangible products produced by certain business system. That is: "Everything that is offered to the market in order to meet the needs or desires of the consumer in the exchange process. The product is a set of tangible and intangible benefits that the consumer may realize by purchase of it. The complexity of the product derives not only from its physical characteristics, but also from the intangible characteristics that are directly related to the needs and desires of consumers. The product is a basic element of the marketing mix and the starting dimension that other elements of marketing rely on "(Grbac, B., 2005). The term "new product" is quite wide, but usually the prevailing opinion is that the new product only the product that represents something revolutionary, something that does not yet exist on the market. One should nevertheless bear in mind that such product is only one type of new products. The first step in the product development process

is the generation of ideas, and this step should necessarily be accessed systematically, carefully listening to the needs of the environment.

The main source of ideas for new products are most often:

- **customers** - they know what they want and great number of quality ideas just come from them,
- **employees** - have good knowledge of current products and often have good ideas for new ones,
- **sales representatives and distributors** - are well

acquainted with the market and know what is missing on it,

- **innovators** - some innovators have good ideas for new products.

Figure 2 presents the participants who most often come up with ideas for a new product, namely: customers, employees, sales representatives and distributors, and innovators.

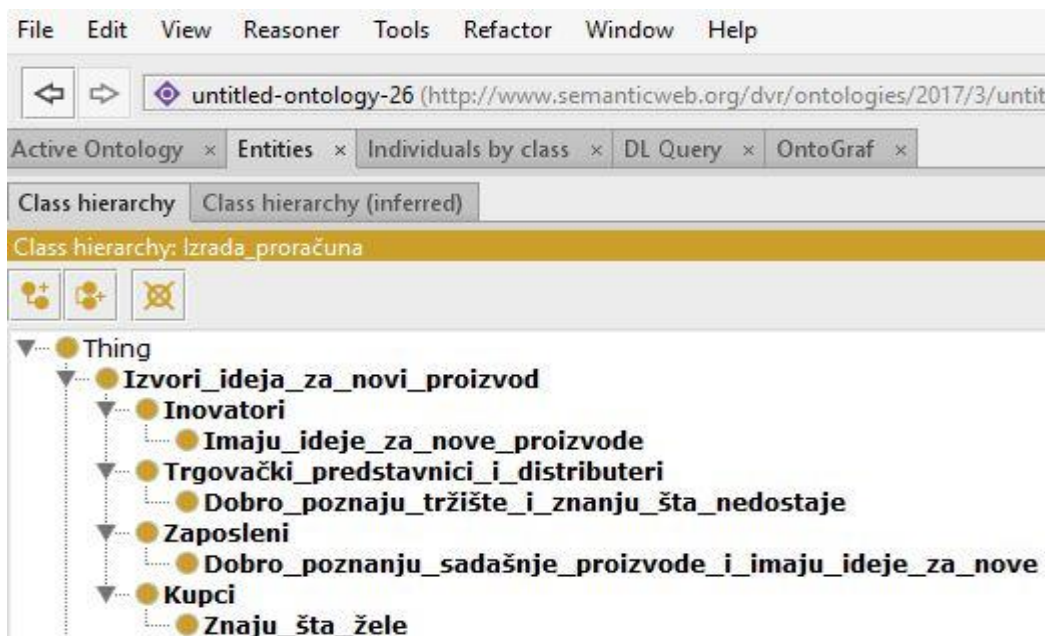


Fig 2: Sources of ideas for new product

A large number of business systems direct their development and production strategy towards several markets. For each of these markets they prepare appropriate marketing mix.

Business system that starts with new product development has some expectations from it (Drucker, P., 1985):

- for the new product to present it as an innovative business system,
- to defend existing markets and conquer new ones thanks to new product,
- to take advantage of new technological solutions in a different way.

The process of new product development should have at least the following phases:

- optimization of existing production program;
- determining the available production capacities;
- market research;
- collection of ideas for new product development;
- concretization of the new product proposal;
- analysis of the financial conditions;
- technical and technological basis for development;
- test a new product on the market;
- launch of a new product on the market;
- programmed marketing activity related to new product;
- control of efficiency of all processes.

Using Protégé editor we will present some of the knowledge necessary in the new products development process (Figure 3).

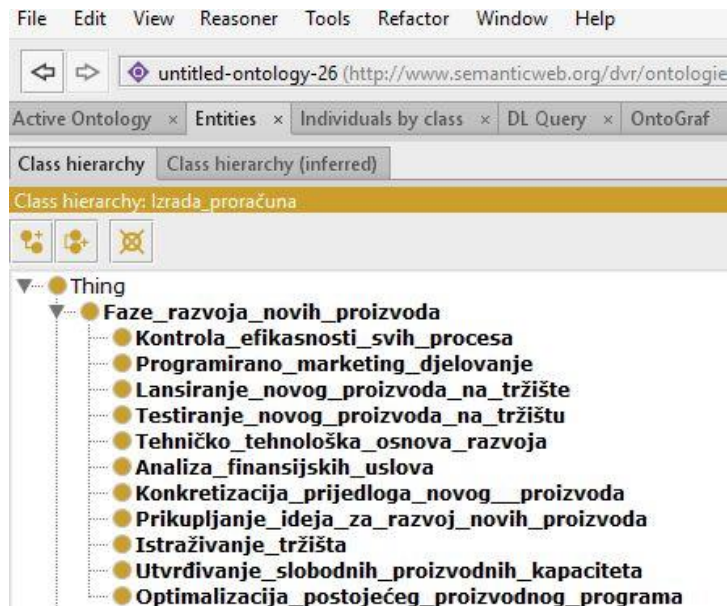


Fig 3: Part of new product development phases

The process of creating a new product takes a few months, and if appropriate packaging or new production capacity is necessary, then it can take much longer. Products become obsolete quite quickly, so the development of new products is necessary.

The decision on accepting or not accepting the production of a new product is difficult and responsible task of operating system (Grbac, B., 2010). It is, therefore, necessary to apply adequate methods and quantitative

analysis. The creation of a new product for a very saturated market is a major challenge. Therefore, a large number of business systems directs their efforts towards products where competition is not strong or chooses areas that recorded growth.

When launching new products, one should keep in mind that:

- Every product has a certain life span,
- Sales of product goes through specific phases:
  - introduction,
  - growth,
  - maturation,
  - Withering away.
- Profit increases and decreases in certain stages of the product life cycle;
- Different products require different strategies.

The task of marketing in terms of new product development is the following:

- coordination with all departments working on new product development process;
- creation of marketing plan for a new product;
- budgeting for a new product;
- performance of preparation for the market test;
- preparation of all other measures to launch new products.

### Introduction of A New Product

Operating system produces new products to satisfy the needs and desires of customers, to be more efficient and more effective than the competition, and to increase sales and provide higher profit. In new product development, marketing plays a very important role. The marketing team of the business system is actively cooperating with all the other teams in every phase of product development (Meier, M., 2005).

Preliminary draft of marketing strategy for a new product can be implemented in three parts. The first part should contain a description of the size, structure and behavior of the target market. It must also include defined desired market position of the product, target market share, and profit goals.

In the second part should be elaborated strategy of prices, distribution strategy, and overall marketing budget.

The third part of the platform for development plan of marketing strategy defines the long-term sales, long-term profit targets on which one will create the long-term marketing plan to position a new product.

The main task of marketing in modern business system has grown from a business function to one of the essential systems of management. Its activities are present from the development and design of new products, to the control of promotion and sales monitoring. Marketing has now assumed a key role in managing the process of developing new products, overseeing all research and development activities. The basis of the activities is to identify good business ideas, particularly those with commercial and profit potential.

In order for the rest of 10% of those successful products, operating system needs to know which secondary and tertiary characteristics of new products or services to give priority to, and to invest additional resources during the development of new products exactly in them. It must assume a possible success or failure of new products, and

continuously monitor and investigate the market. Timely detection of these and many other factors will surely contribute to the economy of the activities undertaken in the development and promotion of new products.

A new product is definitely a chance to improve one's business, but it can also be a risk to the business system. The emergence of new product on the market causes changes of the market situation, because the other participants in the market, especially the competition, will notice the emergence of a new product and respond adequately.

Important role in addition to the design, composition, quality, functionality, and equipping of a new product, has a selling price. If a new product begins to realize commercial success, the business system must be able to use appropriate sales prices policy to hold in the market. If the starting price is too high, it can certainly call into question the level of sales, especially if competitors respond adequately by lowering the prices of their products and creating favorable conditions for retail chains. Figure 4 presents some of the important characteristics of the new product.

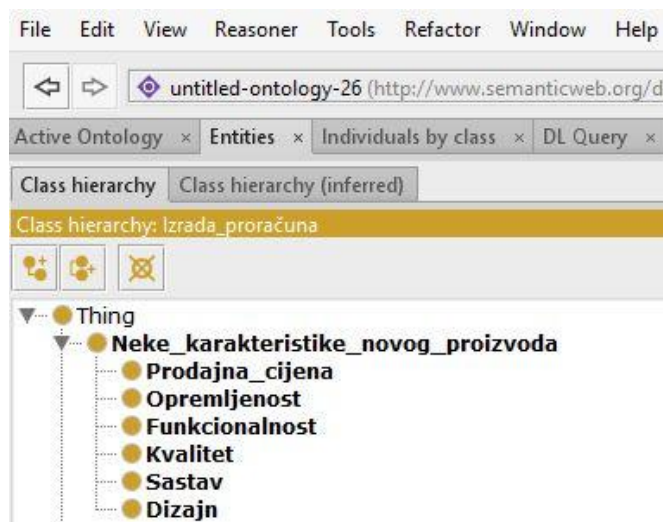


Fig 4: Characteristics of the new product

Phase of introducing a new product on the market is one of the most complex phases of the sales policy of the business system. In the beginning of the launch of new products, production is low, turnover is small because the product has not yet gained recognition in the market, so in this period production costs are high. The cost of advertising and propaganda in this period are high because effective and efficient activity is necessary.

The goal of the business system has to be to, as soon as possible, overcome the dangers of the first phase of the new product life cycle, and to start the mass production as soon as possible.

Potential buyers must be promptly advised of the emergence of a new product. Most new products are introduced to market through propaganda action because manufacturers have come to the conclusion that it is also necessary to invest resources and efforts in the construction of market (Renko, N., 2009). Buyers will be interested in a new product if it can more effectively meet their needs. In practice, a lot depends on specific conditions and on a number of factors that affect the market. Some of the business systems that access the launch of a new product

can predict these factors, and some cannot, because some elements do not exist, and appear only when a product is created.

Characteristics of the first phase of the new product life cycle are:

- The launch of a new product on the market is very complex process for the business system.
  - the production is small,
  - the cost price is very high,
- The launch of a new product on the market should be well prepared:
  - effectively implemented advertising,
  - good sales path created,
  - the market test performed,
  - investment in human resources and public relations.
- The network of distributors react cautiously, depending on:
  - the main features of the new product,
  - the interests of customers for the new product,
  - the benefits that they obtain from the manufacturer,
- Competition in the market increased vigilance:
  - Decides to make strategic and tactical changes.
- Customers react slowly and cautiously.
  - They alone evaluate the advantages of the new product.

The launch of a new product comes after a successfully implemented and well-prepared market (Tomic, Z, 2010). Placement of a new product depends on the quality of preparation throughout the whole process, from proposal of the innovator to market analysis and market preparation for the acceptance of a new product. If the new product is good, if it has proper characteristics, it will certainly bring better results in terms of the fast acceptance.

In order for the new product to be well accepted, one must

perform:

- Quality test of the market,
- Verify the results of the testing,
  - to forecast market size,
  - to make good sale price,
  - to have efficient ways of distribution.
- Know the habits and needs of consumers,
- Constantly control the work and efficiency of sales operations.
- Measure the sale and monitor profit.
- Make quick and efficient decisions.

All this can only be provided by an efficient and effective marketing. In Figure 5. Presented is part of the knowledge necessary for good presentation and acceptance of a new product.

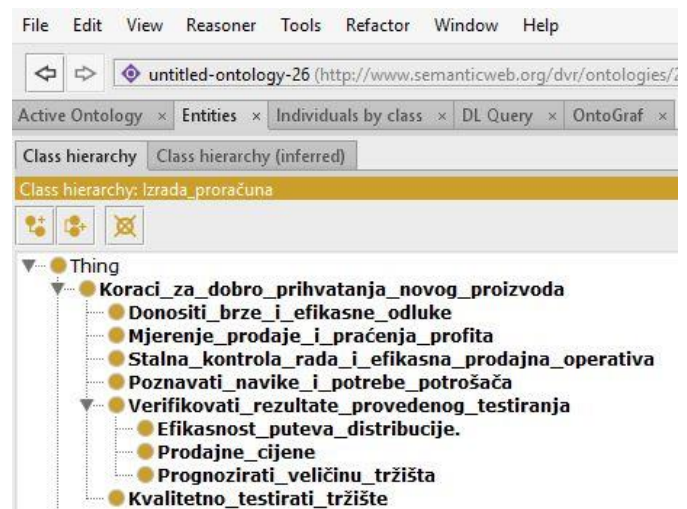


Fig 5: Steps for good acceptance of a new product

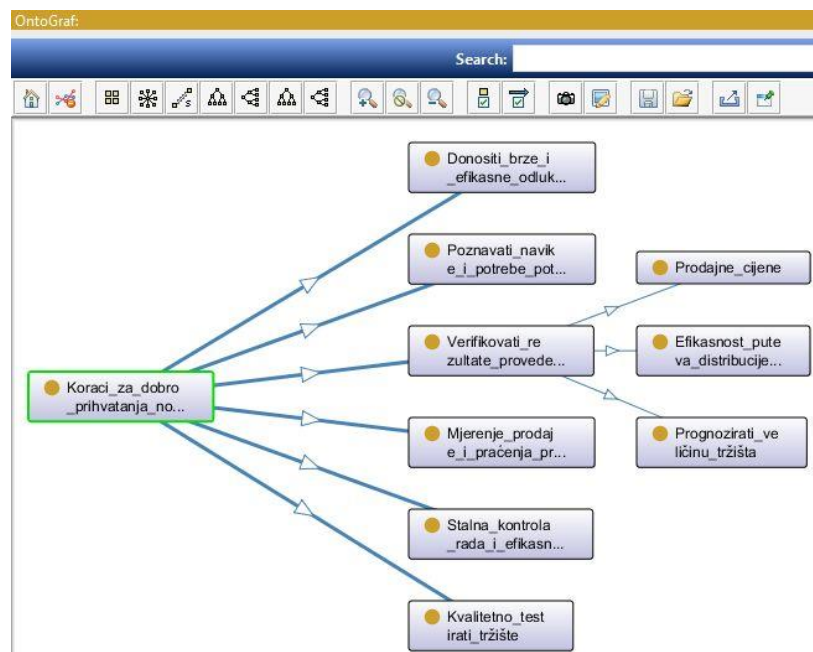


Fig 6: Onto Graf /Steps for good acceptance of a new product

By launching the product begins its process of commercialization, and the product must begin to return the

funds that were invested in it, and generate appropriate profit. For the new product to be correctly placed on the

market, it is necessary to determine the exact time of the launch. It is essential for the new product at this stage to be accepted by customers because its future survival almost exclusively depends on it. That way, all marketing activities that have been implemented materialize.

Efficient management of new product, price, distribution and promotion, should be planned in a way to, as far as possible, meet the needs of the target market section. Customers vary according to their specific individual needs and marketing planning should be directed towards these needs.

The introduction of new products on the market requires large investments in its promotion. At this stage, the costs of promotion and other marketing costs are significantly higher than sales revenue. If consumers accept the new product, there comes increase of sales and increase of production as well as decrease of unit costs and creation of profit. One should take further efforts to capture as much of the distribution channels as possible. A decrease in expenditures for promotion appears because satisfied customers become its promoters.

At a time when the product is fully accepted in the market, one should occasionally investigate its position in relation to competing products.

### Conclusion

The process of creating a new product takes a long time, and its effective presentation to potential buyers should be carried out very efficiently and effectively. For its presentation, it is necessary to have appropriate knowledge which has to be obtained very quickly. In this paper, we suggest a different approach to obtaining this necessary knowledge by using Protégé editor, an open source platform. We suggest the use of the knowledge base and the semantic web for easier and faster obtaining of necessary knowledge.

Our goal was not to enter all the knowledge in a knowledge base, but only to propose a new and unique concept for quickly obtaining of the necessary knowledge. Further research would involve work on more comprehensive update of the knowledge base.

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