BABEŞ-BOLYAI UNIVERSITY OF CLUJ-NAPOCA

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

BUSINESS INFORMATION SYSTEMS DEPARTMENT

VIRTUAL MARKET ANALYSIS.

METHODS. TECHNIQUES. APPLICATIONS

SUMMARY

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Abstract

Third millennium business is extremely dynamic, mobile and flexible, constantly changing. To meet the constant changes we have to keep up with the innovations, the trends and the new technologies. In this context we see the economy move to e-economy, the business to e-business, the market to virtual market. In this paper we propose a framework for virtual market analysis, that we successfully implemented in real business. We use notions of economics, marketing and IT. The results of our research are presented as a result of collaboration between the university and the business environment.

Keywords: e-marketing, virtual market, v-market, e-training, virtual organization, e-learning, total mobility, indicators, information systems, analysis, e-communication, affiliate marketing, e-services

Contents

Introduction

In this paper we investigate the methods, techniques and applications of virtual market analysis. The theme and approach of this work will be interdisciplinary, using IT, e-economy and e-marketing concepts. We aimed at proposing a virtual market analysis framework. To this end, we segmented the research into 6 major phases, each addressing the virtual market from another angle.

The first step will be to clarify the theoretical concepts of e-economy and e-marketing (eg. virtual marketplace, virtual organization, virtual company, mobile employees, mobile boss, e-activities, etc.).

The second stage of research will consist in proposing a virtual market analysis model, the identification and classification of virtual market analysis general indicators, the testing and validation of Monte Carlo variables modeling method as decision making indicator for the decision making process in the virtual market, the identification and testing of site analysis software.

At this stage we intent to identify and study at least 30 web analytics solutions.

In the third stage we will clarify the concepts of computer science (eg. information system, computer system, etc.) and we will propose a virtual market analysis information system.

We will address the virtual market in terms of actual practice activities conducted by firms and we will take into consideration: assisting a business in terms of decision making (transforming data and information into knowledge) and assisting current business activities (the actual execution of activities that will include the capture of market information and the automatization of tasks).

We will also segment the current activities in general activities (treated in Chapters 3 and 4) and domain-specific activities (treated in Chapter 5).
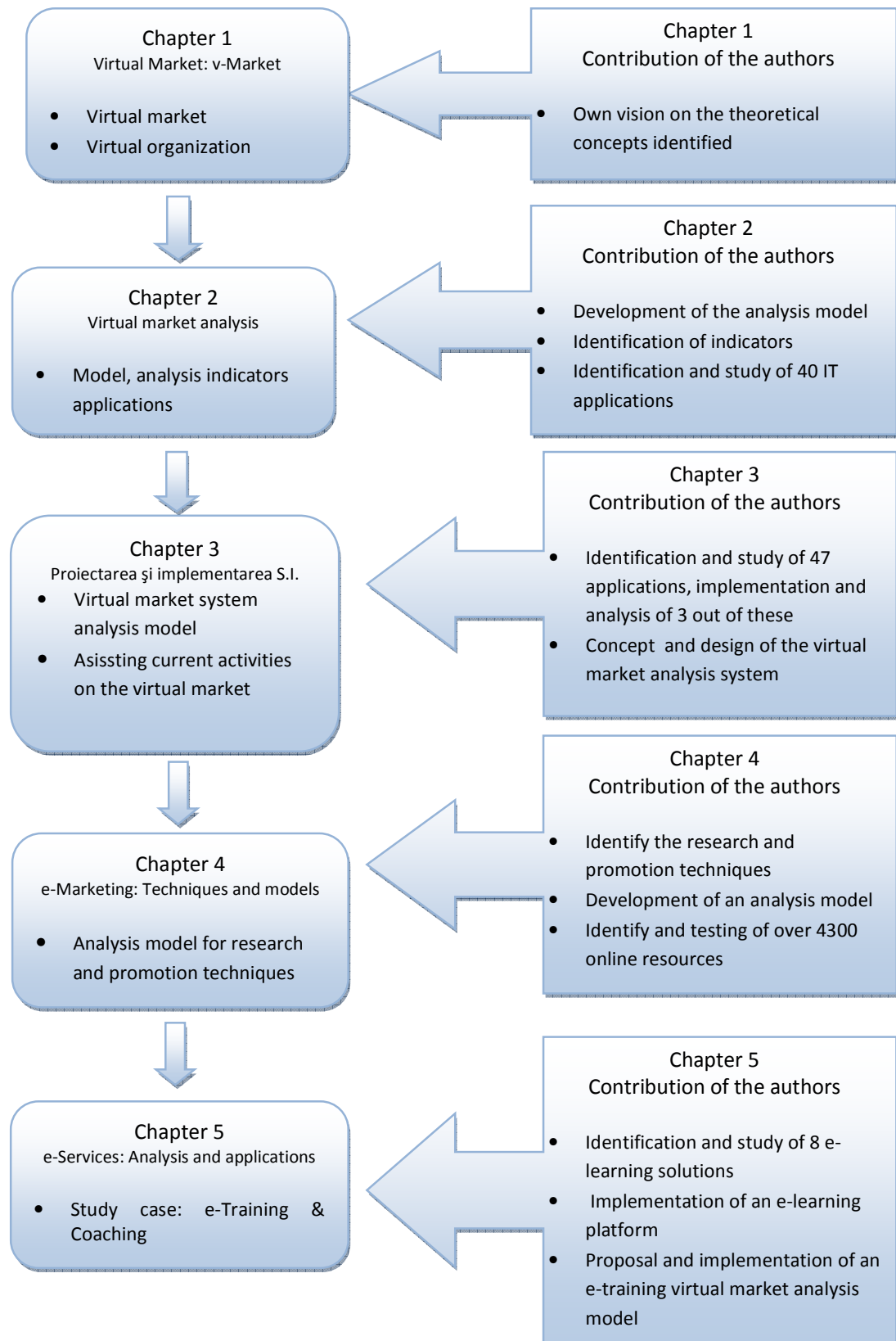
Chapter 1
Virtual Market: v-Market

- Virtual market
- Virtual organization

Chapter 1
Contribution of the authors

- Own vision on the theoretical concepts identified

Chapter 2
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- Model, analysis indicators applications

Chapter 2
Contribution of the authors

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- Identification of indicators
- Identification and study of 40 IT applications

Chapter 3
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- Virtual market system analysis model
- Asissting current activities on the virtual market

Chapter 3
Contribution of the authors

- Identification and study of 47 applications, implementation and analysis of 3 out of these
- Concept and design of the virtual market analysis system

Chapter 4
e-Marketing: Techniques and models

- Analysis model for research and promotion techniques

Chapter 4
Contribution of the authors

- Identify the research and promotion techniques
- Development of an analysis model
- Identify and testing of over 4300 online resources

Chapter 5
e-Services: Analysis and applications

- Study case: e-Training & Coaching

Chapter 5
Contribution of the authors

- Identification and study of 8 e-learning solutions
- Implementation of an e-learning platform
- Proposal and implementation of an e-training virtual market analysis model

Figura 1 Thesis plan and contribution of the authors

We will propose methods and indicators to analyze the overall activities of e-communication, e-marketing and e-management.

The fourth stage will be to review the overall activities carried on the virtual market in terms of the e-marketing department. We will test the virtual market research and promotion techniques: web directories, online ads, search engines, online groups and affiliate platforms. For each of these we will propose a framework and analysis indicators.

As part of the fifth step we examine the specific activities carried out in the virtual market, according to the e-customer service. We will take as study case the e-training services offered by Transylvania Business Center. We will integrate these services in the virtual organization, we will follow the steps taken to transform the training department from classic into a virtual one, whose activity is carried on the virtual market, we will build and implement new systems to raise the efficiency of organization providing training e-services and we will propose a final model of the virtual market analysis for e-training.

For all the practical applications we have received permission from Transylvania Business Center (CAT) to make observations, data collection, analysis and system design, solutions implementation, testing and validation.

As a last step, we draw conclusions, the authors' own contributions, and we propose future development directions.

1. Virtual market: v-Market

In this chapter we have identified and analyzed the theoretical concepts that will be the basis of our future research of virtual market analysis methods, techniques and applications.

Based on the specialized literature, both national and international, we created and we presented our own vision on the virtual market concept. We can see a virtual market as an abstract element (a way, a method) or as a practical element (an

electronic platform, a web site). In the following chapters we will look at the virtual market as an electronic platform that consists of virtual stands with products and services exposed, that facilitates the sales process - purchasing over the Internet.

We analyzed the concepts of virtual organization, e-work, e-employment, e-communication, e-departments presented in the specialized literature and we proposed our own vision on them.

2. Virtual market analysis

In this chapter we developed a market analysis framework in terms of virtual marketing mix and we have identified and defined a set of general indicators for virtual market analysis. Next, we processed one of the indicators using the Monte Carlo method to obtain information upon which managers can make decisions. In the second part of the chapter we have identified and tested site analysis tools, aiming at the data each of them provides.

The five categories of indicators that were identified, defined and classified in section 2.2 will be considered as input within the virtual market analysis system that will be developed and proposed during the research. The identified computer applications, studied and presented in section 2.4 will be the data source, and will have the role to provide the values of the necessary indicators for the market analysis system.

By processing the input data through various methods such as the Monte Carlo method, used and presented in section 2.3, the system will generate statistics, charts and reports to be used in marketing decisions. For example, the websitegrader.com tool provides as input data, the number of links to our site, but also the number of links of our competitors.

Using alexa.com, we can compare our site traffic with the competition's and through www.googlerankings.com we can check the position that our pages appear in the Google results, and also our competitors' position. Following this information in

the form of statistics and reports, we evaluate our position and progress over time and also our position relative to our competition.

The motivation for identifying and proposing several IT solutions is that using a single analysis tool we can receive incorrect or incomplete information. For example, checking the number of links to a site with three different instruments we obtained the results of 571, 3010 and 6580. In this case, we can take into consideration the return values just to report ourselves to the number of links of our competition and not as absolute values. We propose the use of multiple indicators and measurement tools and inclusion in the reports of the returned results by specifying the software application that provided the input data.

Also, through the information returned, the tested tools can be a source to identify additional market analysis indicators according to the category of services offered and the vision and desires of the leadership of the organizations present in the virtual market.

As a future perspective we plan to expand the research and indicators on social networks.

3. Design and implementation of information systems

In this chapter we analyzed the virtual market in terms of organizations that sell and buy products and services and the information systems they use.

We considered the usefulness of information systems in the virtual market from two perspectives: the performance of daily activities and decision making. We chose to refer to the decision making process as a whole and not segmented by management level (operational, tactical and strategic), taking into account small organizations where these levels are intertwined.

From the management perspective, based on the analysis framework proposed in Chapter 2, we developed a generic model of a virtual market analysis system that can be adapted to the specific needs of each organization. Then we exemplified the

operation of this model by analyzing one of the generic indicators proposed in the previous chapter.

In terms of operational staff we have followed the steps of an information system life cycle and we implemented three different solutions, each for a specific activity: e-communication, e-marketing and project management. For each e-activity we synthesized the specific problems we found during the implementation, as well as specific items that we identified in the activity of an organization present in the virtual market. We selected and we propose 18 specific indicators for the analysis of operational activities in the virtual market. We propose adding them to the five categories of indicators proposed in Chapter 2 to the virtual market analysis (Figure 2).
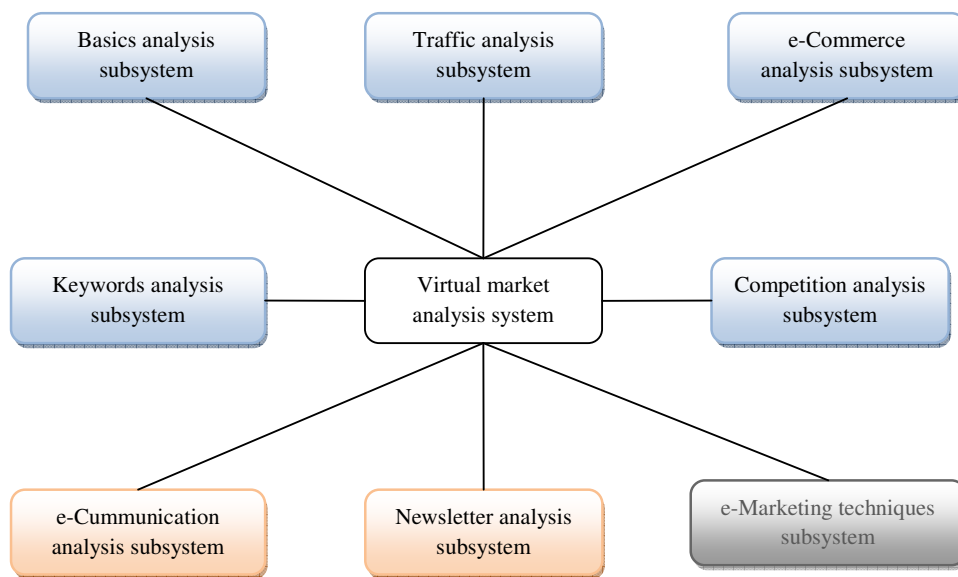

Figure 2 Virtual market analysis subsistems

So far, we have researched seven categories of indicators and virtual market analysis subsystems. We dedicate the next chapter to the e-marketing research techniques in the virtual market.

4 . e-Marketing: techniques and models of research and promotion

In this chapter we have identified and analyzed the virtual market promotion techniques. We developed a general framework for implementation and analysis of promotion results as an activity carried on the virtual market. For each technique we developed an implementation and results analysis framework and we extracted the characteristics and features of using that technique.

The specialized literature [33] believes that one of the most important offpage SEO indicators is the number of sites that create a link to the promoted site. All techniques examined above, in addition to the role of promoting and bringing visitors or buyers also have the role to create links to the promoted site and thus improve the site in terms of search engines. The technique that we consider the least useful in terms of offpage SEO is e-ads because the ads have to be reactivated periodically.

For each promotion technique we identified and proposed the indicators to include in the virtual market analysis system, in the *analysis of e-marketing techniques* sub-category (Figure 2). We propose the addition of 40 indicators of which 6 to analyze web directories, 8 e-ads, 4 search engines, 8 e-groups and 14 for affiliations. We propose also to track the presence of the competition in the web directories, e-ads and search engines.

For the future we plan the expansion of the investigated e-marketing techniques by including social networking and mobile marketing features.

5. e-Services in the virtual market. e-Training & Coaching: analysis and applications

In Chapter 5 we took as study case the e-training & coaching virtual market of CAT Cluj, according to the previously proposed system.

We went through the specialized literature and we summarized the theoretical concepts of e-learning: characteristics, models, advantages, disadvantages, content management solutions, etc..

In the second part we analyzed the needs of potential beneficiaries. This was followed by a comparative analysis, the selection and implementation of an educational content management system. In figure 4 we present the final model of the e-training virtual market that we created and managed during this research. We followed the analysis of this market based on the model, indicators and applications explored in chapters 2, 3 and 4. We aimed to apply in practice the proposed model at a real customer and not to publish information considered confidential by it. Our beneficiary's objective, after this analysis was to determine the future strategy for: system design and continuous adaptation of the work system for the customers' comfort, to prepare the clients for purchase (user training) and long-term customer loyalty.

Compared to 2008, participation to the Training & Coaching Centre's courses increased by 1835%, an increase of 761% in the second year (2009) and 241% in the third year (2010) [62]. In the first year, 39 people were trained in e-Marketing and Mobile Business (eMK, mBIZ). During the following year, the number of participants has reached 297 people and 1650 in the third year.
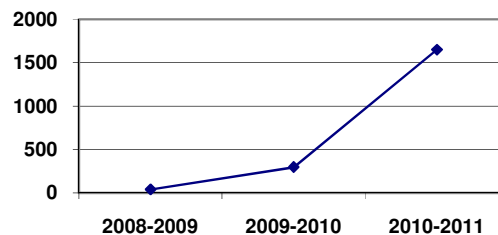

Figure 3 Training & Coaching center. The evolution of trainees number 2008-2011
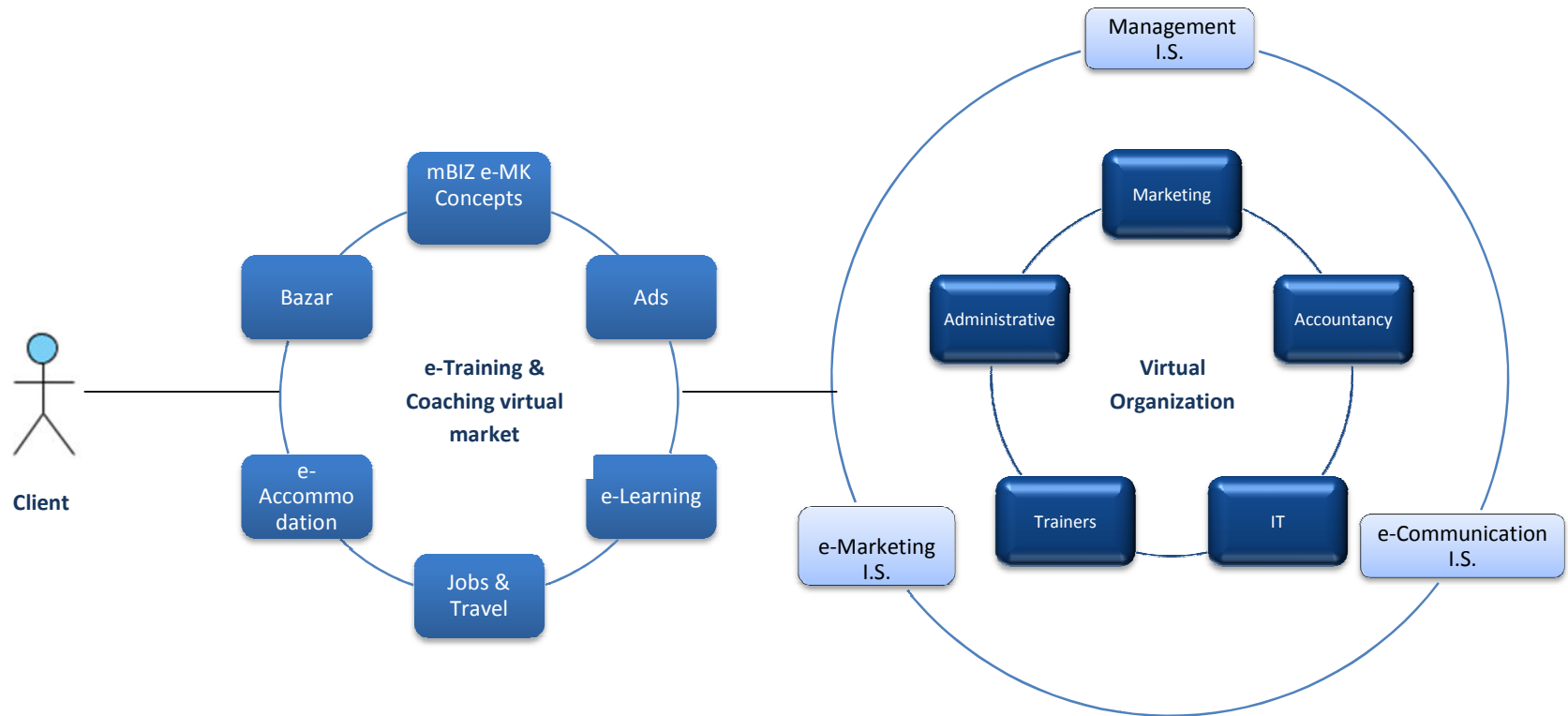
Figura 4 Tested and validated model for the e-training virtual market. Centrul de Afaceri Transilvania - 2011

6. Conclusions

6.1. The contribution of the authors and general conclusions

In this paper we presented the results of our research conducted during 2008-2011, items related to the virtual market analysis. In the research and analyzes we took as a starting point theoretical concepts in the fields of economy, marketing and informatics.

The definitions and classification criteria that we have identified, created an initial view on the typology of these markets. We considered the virtual market as a "virtual electronic platform consisting of stands that have exposed products and services and that facilitate processes of sale - purchase via the Internet". We observe that some of the virtual market's attributes that we have identified in the literature, also correspond to the real market.

We consider that the organization operating in the virtual market is its core. We identified the main concepts related to virtual organization: e-work, e-meetings, e-business, e-staff, e-teams, e-boss, etc. After reading the specialized literature we presented our own vision on the concepts of virtual organization and virtual company. We presented the parts of a company, respectively those of an e-company. We believe that these aspects are essential in the design and construction of virtual markets, which in turn must take into account the needs, desires and tastes of these market players: sellers and buyers.

In the second chapter we have identified the features of the marketing mix elements in the virtual market, then we developed and presented a framework for virtual market analysis from the perspective of the marketing mix. Using specialized literature and our own observations we have identified and classified 27 generic virtual market analysis indicators into 5 categories. We believe that they are the most important general indicators of market analysis.

Next we applied a method of processing the collected indicators, in order to transform data into information and knowledge, useful for decision makers. After the application of the Monte Carlo method, it resulted the possibility to use it for decision support for different virtual market indicators such as estimating the number of unique visitors, estimate quantity and value of sales, etc..

We have identified the existing tools for analyzing sites and made a comparative study considering the five indicator categories. These tools provide us with input data for the virtual market analysis system and they can be a source of identification for additional market analysis indicators. We have identified the facilities offered by Google for researchers, analysts and marketers and proposed some possible improvements to the Google Webmaster Tools.

In the third chapter, after researching the bibliographical sources on virtual markets and information systems we have created a general model of a virtual market analysis decision support system. In this model we have proposed a virtual market segmentation on four levels: company, product, customer and market as a whole. After analyzing the system we have developed the use case diagram, class diagram and diagram to assist the current business activities in the virtual market and we proposed a general architecture of the market analysis system, whose operation we exemplified on the „unique number of visitors" indicator.

We selected three current activities categories: e-communication, e-marketing and e-management. We reviewed 59 applications and selected three, one for each category of activities. After their implementation, we completed the virtual market analysis system with 18 specific indicators and we automated or improved the following operations or activities: communication within the organization, information, promotion and coordination of internal projects. Also in the pilot organization the following efficiency indicators have improved:

- Operating costs have been reduced almost 10 times than with the previous system;
- The time needed to perform operations decreased approximately 3 times;
- The productivity increased around 3 times.

We believe that market analysis should be viewed from two perspectives: the performance of daily activities and market decision-making. Implicitly we believe that the analysis system must be built in view of both perspectives.

In the fourth part of the research we sought the promotion element of the marketing mix. We believe that in the virtual market analysis and promotion must be pursued the elements: web directories, online ad sites, social networks, affiliate sites, search engines and online groups. In this research we analyzed more than 5,000 Romanian and international online resources of which approximately 2000 web directories, 2,000 online ad sites and 300 affiliate sites. On this basis we developed a general analysis framework. For each technique we started from the theoretical concepts (definitions and classifications), we developed a specific framework for implementation and analysis of results, we established the techniques and we extracted the features of using these techniques.

We included in the market analysis system at the sub-category *analysis of e-marketing techniques,* 6 indicators for web directories, 8 e-ads, 4 search engines, 8 e-groups and 15 for affiliations. The proposed indicators we can use for the site analysis and for the competition analysis. We note that we can track the presence of the competition in the web directories, e-ads and search engines, use of e-groups or affiliation techniques, the data is transparent and published on the Internet. We can adapt our own strategy to promote the virtual market based on the techniques covered by our competitors.

In Chapter 5 we took as a case study the virtual market of e-training & coaching implemented at CAT Cluj, considering the previously proposed analysis system. We started from the literature and the service features. We analyzed the needs of potential beneficiaries, we performed a comparative analysis of the LMS, followed by the selection and implementation of a content management system targeted specifically at the education market. Completion of these steps allowed us to extract specific indicators for this type of market. We followed the customer, service and company levels proposed in Chapter 3 for the analysis. Finally we proposed a model for implementation and analysis of an e-training & coaching market.

Assisting decisions and current activities in an information system is necessary for enhancing the automation of operations and development of collaborative components, and especially to increase productivity and competitiveness of products or services. The virtual market develops an unlimited and permanent competition environment, where all these activities and results will be further checked.

6.2. Development prospects

For the next period we plan:

A. To extend the research in terms of using social networking as a means of promotion;

B. To expand the research on mobile marketing features;

C. To analyze the problems of negotiation and direct and reverse auction in the virtual market;

D. To identify new potential beneficiaries where to implement the concept and models accepted by Transylvania Business Center. As the first step we consider the Employers and Craftsmen Association of Cluj, Cluj Chamber of Commerce and Industry and similar from Bihor, Maramures, Bistrita and Alba counties;

E. To correlate the information held by us with statistics held by other companies where we will implement the concept and models proposed;

F. To customize the IT applications according to the needs of each beneficiary;

G. To continue to identify and test new applications and methods to assist current activities and decisions. They will complete the market analysis model and the model to market training services proposed in this paper and will release other models.

6.3 Dissemination of results

Books:

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