Abstra International Journal of Management and Business
Volume 8, Number 1.
March 2019.

ASSESSING DIRECT MARKETING PRACTICES ON THE INTERNET BY MEANS OF THE FUZZY COGNITIVE MAPPING METHOD

Miraç Ahmet [1] Hüseyin Emirhan [2]
[1] Department of Marketing, Faculty of Economic and Administrative Sciences
Atatürk University, Erzurum, Turkey
[2] Department of Business, Industrial Arts Education Faculty
Gaziantep University, Osmangazi Mahallesi, Turkey

Abstract

Numerous sorts of apparatuses are utilized in direct marketing applications on the Internet with email and the being the most critical among these. Then again, the Internet brings some negative variables like spam and infection. Normally these variables influence direct promoting applications on the Internet adversely. The goal of the present investigation is to assess these components, which are done in this application. To achieve this objective, a fluffy subjective mapping technique is made utilization of in the investigation.

Keywords:
Internet, Direct marketing, Fuzzy cognitive mapping

Introduction

Today, data is the primary wellspring of the economy and puts the established set of three of crude material-capital-work, which is important for assembling, down to the second need. The data society opens another upset to individuals, which is creating at a rattling rate. Other than the data wellspring of this insurgency, its most imperative quality is the weakness of financial hypotheses. The Internet and comparable data based innovations, the methods for the data society, are among the wellsprings of the change experienced in economy. The principal phases of the data innovation began with the presence of the PC and proceeded until first experience with homes and little ventures. The second stage, which depends on the Internet, shows up during the 1990s with web innovations used to exchange data inside the association and in the global stage through remote lines. By methods for a great deal of new innovations, particularly data advances, little undertakings can achieve the scale economy and sources claimed by the huge endeavors. Little ventures in this economy are not in a situation to hold themselves under such overwhelming burdens as the greater ones do.

Going with the data society, data and correspondence advances contribute a great deal to commercialization, consequently having financial esteem. Under the impact of worldwide escalated rivalry, undertakings are endeavoring an ever increasing number of endeavors to progressively utilize propelled data innovations and to adjust to new work forms. The ventures influencing utilization of data innovations to decrease costs, along these lines getting to be process-slanted foundations. Data advances get rid of the separations between the undertakings, in this way uniting providers, colleagues, customers and opponents (Tapscott, 1996, pp. 54-56). Advancements in data and correspondence

advances, the Internet specifically, give new offices to the generation, stockpiling, the board, mix and utilization of data.

The Internet is also an effective tool used in direct marketing applications. Direct marketing applications carried out on the Internet are grouped in to two technical terms: web and e-mail. Web has got a technology of which feedbacks can be measured in every step ranging from presentations, advertisement and supporting services and even order-sale procedures, all of which are the activities of the companies to exist on the Internet. E-mail is a technology that has the capacity to reach potential customers, to realize the dependence and promotion strategies within the body of direct marketing system. This study is intended to classify and evaluate the direct marketing applications on the Internet with a fuzzy a cognitive mapping method.

Direct marketing

The use of catalogues for marketing of books in Venice in 1498 and the management of orders directly by mail are among the earliest examples of direct marketing (Odabasi & Oyman, 2001, pp. 303). Direct marketing is first introduced by Montgomery Ward in 1884 and continued by Sears Sherman in 1897 and by Spiegel catalogues in 1905. After Spiegel, the activities of the book club founded by Maxwell Sackheim and Harry Sherman in 1926 are accepted as one of the earliest of data-based marketing activities based on catalogues (Hughes, 1960). Moreover, plastic credit cards developed by the Diner's Club and American Express in the 1950s allowed orders by mail, contributing considerably to direct marketing by mail.

According to Odabasi & Oyman (2001, pp. 304-305), direct marketing includes four basic points. Firstly, direct marketing is an interactive marketing system. This interaction is realized between the organization and client, and based on mutual message delivery. Secondly, responses to the client's ability to move are obtained by the effect of direct marketing. Thirdly, direct marketing is used through the agency of advertisement media. This point allows an organization to reach a client outside of the sales environment, and therefore, information and communication technologies are required. The last point is that response and action toward direct marketing attempts are measured. Consequently, the results of direct marketing actions should be measurable.

Passavant (1984, pp. 7-9) on the other hand, examines direct marketing under four titles. The first is a response to advertising. In direct marketing, advertisement aims at sale and realization of the sale. This case is very different from general advertisement management. Therefore, the advertisement to be applied to direct marketing should contain enough information, as well as motivate the client. The second is the database information about the target mass. In direct marketing, it is necessary to have information about the demographic qualities and buying potentials of the mass to which messages will be sent. The third is the measurable advertisement practice. Measuring the results of the application made in direct marketing is possible and it is quality that has an important strength for planning and strategy developing. The last is the high cost. Even though direct marketing seems to be more costly than several other marketing activities, it has an important advantage that advertisements and sales should be carried out together (Nakip & Gedikli, 1996, pp. 3).

Direct marketing is one of the methods whereby a product is made available to the target mass and the message is presented to him/her in a proper way. Letters, brochures,

catalogues, newspapers, magazines, telephones, faxes, radios, etc. have been used as a direct marketing tool so far (Akaah et al., 1995, pp. 212-213). Today communication tools based on information technologies are used for this purpose. E-mail and SMS can be regarded as recent technologies among the communication tools used in direct marketing.

On the other hand, direct marketing is collected in seven groups according to the communication tools; face-to-face selling, marketing by mail, marketing by phone, direct-answer TV marketing, catalogue marketing, kiosk marketing and online marketing (Kotler & Armstrong, 1998, pp. 512). In face-to-face selling, the aim is to motivate the existing client to buy and the potential client to act. In marketing by mail, a suggestion, reminding note, announcement or similar writing is sent to people with fixed addresses which are determined beforehand. Marketing by phone, the third group, is intended to reach the target client by means of the trained marketing personnel. In direct-answer television marketing, "give an order and win" techniques are used. The fifth is marketing by catalogue. In this kind of marketing, product's catalogue is distributed and sent to the region where a certain mass of consumers live and to the pre-determined addresses. Kiosk marketing uses machines which are located in busy places, such as airports and stores, in order to give information and take orders. The last is online marketing, which is accepted as the last step in direct marketing today. Today online marketing is divided in two groups; marketing over the web and e-mail marketing.

Methodology of the Research and the Findings

Many factors are taken as models in the investigations direct marketing on the Internet. There are also lots of studies about what the factors direct marketing on the Internet is. Plenty of research interest of the studies is included web (Roxas et al., 2000; Karson & Korgaonkar, 2001; Tapp, 2002; Hussain & Perttula, 2006; Bear & Brown, 2007) although the Internet is not only web but also e-mail. Just the right number of the studies contains both web and e-mail in spite of unsorted (Mehta & Sivadas, 1995; Mehta et al. 1996; Dolnicar & Jordaan, 2007). Conversely, the Internet brings some negative factors like spam and virus (Murphy & Massey, 2002; Morimoto & Chang, 2006; Marinova et al., 2006)

The objective of the present study is to classification and to evaluate direct marketing applications conducted on the Internet. To realize this target, a fuzzy cognitive mapping method, as a quantitative method, has been used.

Cognitive Mapping Method

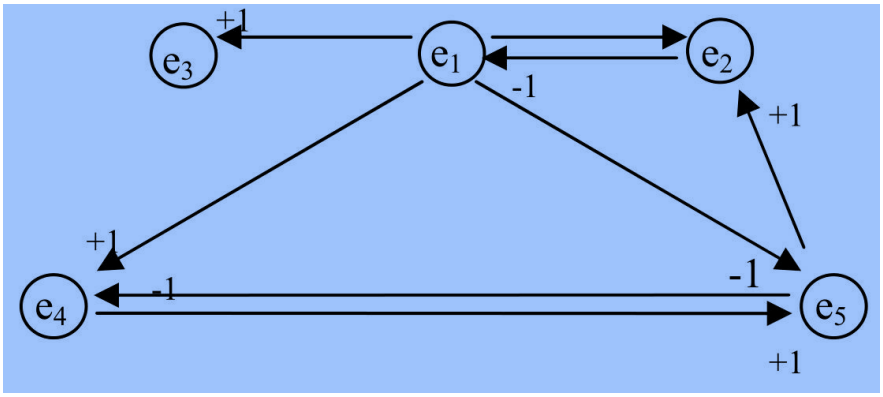
Cognitive maps guide the individual or group's behavior, thus becoming the picture of the relationships between thoughts and events in a systematic frame (Chandra & Newburry, 1997). Cognitive mapping method, the root of which is based on the Graph Theory formulated by Euler in 1736, is maintained by Axelrod (1976) as a structure that examines complex social relationships. This is a method that is used to model the complex systems defining the cause-and-effect relationships between their components. Therefore, the method has been used in several social and technical sciences (Ozesmi, 1999).

Cognitive maps are composed of variables and causal relationships (Axelrod, 1976). Each variable is linked to one another by positive or negative signs in the map. Another step of the process of cognitive mapping is the preparation of binary comparison matrix. Each variable that forms the matrix in this stage is compared with one another according to causal relationships (Eden, 1988). In the fuzzy cognitive maps, the values in the interval [-1, 1] are used, depending on the strength of affecting between the variables. Figure 1 contains

an example of the affecting scheme of fuzzy cognitive map where there are values just between -1,0 and 1. Here e_1 affects 63 and 64 in a positive way and 62 and e_5 in a negative way.

Moreover, e_2 affects ei only, and there are no variables by which e_3 is affected. On the other hand, e_4 affects e_5 in a positive way but is affected by e_5 (negative) and by ei (positive). Lastly, e_5 affects 64 (negative) and 62 (positive), while e_5 is affected by ei (negative) and e_4 (positive). Formed depending on the example in Figure 1, E matrix is given in Equation 1.

Figure 1. Structure of the scheme of fuzzy cognitive map affecting



Degree of Centrality and Counting of Index Values

$$E = \begin{bmatrix} 0 & -1 & 1 & 1 & -1 \\ -1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 & 0 \end{bmatrix}_{5x5} \quad \ldots (1)$$

Mathematical modeling in Graph Theory is used in this method, which is also used in social sciences, especially in strategy developing processes. In this modeling process, connectivity index - density (D), outdegree (odj), indegree (idi), total variables' centrality degree (cO and hierarchy index (h) should be calculated by using the following parameters (Coban & Se9me, 2005, pp. 133-135; Kandasamy & Smarandache, 2003, pp.25-26; Ozesmi, 1999, pp. 144-185).

A formula of the connectivity index is given in Equation 2. Here C shows the number of connections, and 'n' shows the number of variables.

$$D = \frac{C}{n^2} \quad \ldots (2)$$

In calculating the centralism degree of the variables, the vector (od;) is obtained from the sum of the line elements of the E square matrix in Equation 3 and the vector (id;) is obtained from the sum of its column elements are used. The sum of these two vectors leads

to the vector (c_i) that shows the centrality degree of the variables (Equation 6) (Ozemsi & Ozesmi, 2004, pp. 51).

$$E = \begin{bmatrix} e_{11} & e_{12} & e_{13} & \dots & e_{1n} \\ e_{21} & e_{22} & e_{23} & \dots & e_{2n} \\ e_{31} & e_{32} & e_{33} & \dots & e_{3n} \\ \vdots & \vdots & \vdots & & \vdots \\ e_{n1} & e_{n2} & e_{n3} & \dots & e_{nn} \end{bmatrix} \quad i=1,..,n\ ;\ j=1,...,n \qquad \dots (3)$$

$$od_i = \sum_{j=1}^{n} e_{ij} \qquad i=1,..,n \qquad \dots (4)$$

$$id_i = \sum_{j=1}^{n} e_{ji} \qquad i=1,..,n \qquad \dots (5)$$

$$c_i = od_i + id_i \qquad i=1,..,n \qquad \dots (6)$$

To analyze the hierarchical features of the cognitive map, Equation 8 is necessary. The hierarchy index (h) is within the interval [0, 1]. Ifh= 0, the cognitive map is accepted as "fully democratic"; if h=l, the cognitive map is accepted as "fully hierarchical" (Ozesmi & Ozesmi, 2004, 51; MacDonald, 1983).

$$\mu_{od} = \frac{\sum_{i=1}^{n} od_i}{n} \qquad \sigma_{od}^2 = \frac{\sum_{i=1}^{n} (od_i - \mu_{od})^2}{n} \qquad \dots (7)$$

$$h = \frac{12\sigma_{od}^2}{n^2 - 1} \qquad \dots (8)$$

Collecting the Data

While collecting data, the participants were requested to draw cognitive maps stating the factors affecting direct marketing on the Internet. A focus study group consisting of 7 participants composed of experts was formal to deal with the subject of the study. To that end, attention has been paid to the fact that the members of the study group in this research should be the academicians of marketing or the staff of a private sector marketing department.

Findings

Table 1 contains the variable (n), connection numbers (C) and connection index (D) of the individual cognitive maps named for each cognitive map. Decision cognitive map is formed with their combination. As can be seen in the table the average connection index,

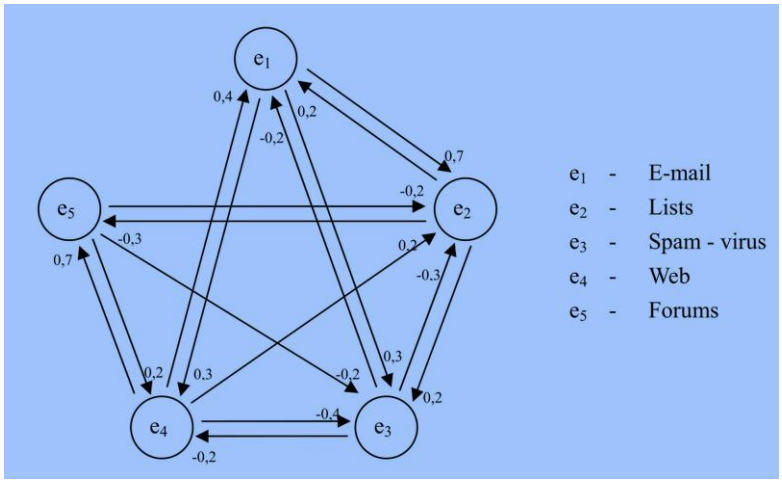
(the density value of the individual cognitive maps) is found as 0,645 and the connection index of the decision cognitive map is found to be 0,640.

Table 1. Density data

Maps		Variable N	Connection C	Density D
	Number of maps	7	7	
Individual Cognitive Maps	Total	30	83	
	Average	4,286	11,857	0,645
	Standard error	0,565	2,314	
	Standard deviation	1,496	6,122	
Decision Cognitive Map		**5**	**16**	**0,640**

Figure 2 presents the decision cognitive map. The map shows 5 variables and 16 connections. The first of the variables is e-mail, the second is the mailing lists also known as listserv (or lists), the third is spam & viruses, the fourth are web sites and the fifth are forums. The matrix that represents this map is given in Equation 9. The calculations made to analyze the hierarchical value of the cognitive map have yielded to the value of 'h' as h=0,264. This finding suggests that the cognitive map is closer a democratic structure.

Figure 2. Decision cognitive map



As can be seen, e-mail affects the lists in a positive way and the lists affect the e-mail in the same way. A similar case is valid between the e-mail and web tools. Both affect each other and thus direct marketing on the Internet in a positive way. However, e-mail affects the spam applications in a positive way, while spam applications affect the e-mail in a negative way. In contrast, the lists affect spam & viruses in a positive way, while spam & viruses affect the lists in a negative way. In addition, there is a reverse interaction between the lists and forums. Similarly, there is a reverse interaction between spam & viruses and web applications. Finally, a positive interaction between the web and forums has been found.

$$E = \begin{bmatrix} 0 & 0,7 & 0,3 & 0,3 & 0 \\ 0,2 & 0 & 0,2 & 0 & -0,3 \\ -0,2 & -0,3 & 0 & -0,2 & 0 \\ 0,4 & 0,2 & -0,4 & 0 & 0,7 \\ 0 & -0,2 & -0,2 & 0,2 & 0 \end{bmatrix}_{5\times5} \quad \sigma^2_{od}=0,529 \quad h=0,264 \quad \dots (9)$$

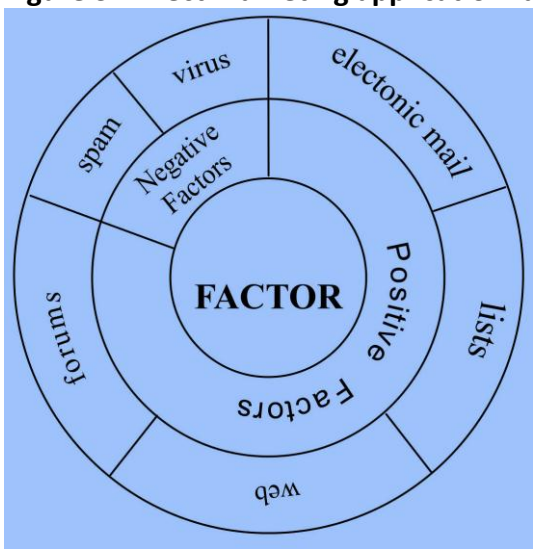
Matrix E in Equation 9 is composed of the binary comparison values of the variables. Centralism vector (c^, which is equal to the sum of the line and column vector of the matrix, is given in Equation 10. According to these findings, there are four direct marketing tools in use on the Internet. These are e-mail (1,7), web (1,2), lists (0,5) and forums (0,2), respectively. Spam&viruses (-0,8) are also determined as factors which affect the direct marketing applications on the Internet in a negative way.

$$c_i = \begin{bmatrix} 1,7 \\ 0,5 \\ -0,8 \\ 1,2 \\ 0,2 \end{bmatrix}_{7X1} \quad \dots (10)$$

Discussion and Results

The factors affecting direct marketing applications on the Internet as a result of thee fuzzy cognitive mapping method can be divided into two groups, the first one is positive and the other one is negative. Positive factor tools are e-mail, lists, web and forums. The negative ones are spam & viruses. Figure 3 gives this classification visually.

Figure 3. Direct marketing application factors on the Internet



The first of the direct marketing tools on the Internet is e-mail. Today e-mail has a big role in direct marketing applications besides being a mean of communication often preferred by organizations. Any message can be easily sent to any remote part of the world in a very short time. In a study made on adults together with the ClickZ research firm, Burns (2005) stated that 77 percent of the Internet users refer to and use e-mail.

Lists are the way in which e-mail systems are used collectively in a shared platform. The individuals, groups and organizations that are interested in a shared topic can, by using this tool, communicate with one another. Lists have two different qualities that are interactive two-way lists and one-way lists. In interactive two-way lists model, which are also called e-mail groups, any message sent by any member of the group is delivered to all the members. One-way list model, however, is based on system whereby the process of sending is realized by the one/ones authorized. In short, the system is a structure in which there are more receivers while the sender is just a single one (Hasiloglu, 2007, pp. 65).

In marketing applications by e-mail and lists, data bases which are the supporters of direct marketing are very harmonious. It is possible to realize at a very low cost the applications, such as feedbacks, reaching the client, success levels and measurement (Rizzi, 2001, pp. 58).

Other direct marketing tools on the Internet are web applications. The web is an ideal interface that transfers to the user any kind of information. This tool secures transition to other pages if any word or word group or symbol in a page is interactive. According to Cyber Atlas (cyberatlas.com), a research firm, the numbers of the telephone users reach 10.000.000 within 38 years while this period was only 3 years for web users. Such a fast spread of the use of web guides the practitioners of direct marketing. The firms that especially conduct the B2C trade model today have designed their web sites in accordance with the direct marketing and data-based marketing strategies. The applications of Amazon (amazon.com), which makes itself heard all over the world by selling books on the Internet, are among the examples to be given in this subject. Amazon follows and stores in its data base the research made by its clients about its products, namely the behavior of users of the site. In this way, special can be offered to the clients so that they can buy the products they are most interested in. The system employed by Amazon can conduct this process momentarily and measure the feedback.

Forums are also among the positive factors affecting direct marketing applications on the Internet. Not unlike the lists, forums are a platform in which the individuals come together about a shared topic. Direct marketing applications can be conducted in this platform though not so densely. Marketing managers generally use the forums to keep together their potential clients and conduct measurable applications to motivate them to buy.

Spam & viruses affect direct marketing on the Internet in a negative way. The use of e-mail in a number of applications, such as unlicensed advertisement messages sent individually or collectively, information to mislead and trick, virus-containing software and so on, is considered to be spam. According to Microsoft (microsoft.com), viruses are the software that hinder the running of computers, record or delete or destroy the data, or send themselves to other computers via the Internet, thus causing deceleration or some other problems in those computers. As spam & viruses damage the users, they may be able to prevent the development of direct marketing applications on the Internet.

References

Akaah, I.P., Korgaonkar, P.K., & Lund, D. (1995). Direct Marketing Attitudes. *Journal of Business Research,* 34(3), 211-219.

Axelrod, R. (1976). *Structure of Decision, the Cognitive Maps of Political Elites.* NJ Princeton: University Press.

Baer, A.G., & Brown, C. (2007). Adoption of E-Marketing by Direct-Market Farms in the Northeastern United States. *Journal of Food Distribution Research,* 38 (2), 1-11.

Burns,E.(2005).E-mail Marketing Headache. *The ClickZ Network,* 25 (Apr'07): http://www.clickz.com/showPage. html?page=3500066.

Chandra, R., & Newburry, W. (1997). A Cognitive Map of the International Business Field. *International Business Review, 6* (4), 387-410.

Coban, O, & Secme, G. (2005). Prediction of Socio-Economical Consequences of Privatization at the Firm Level with Fuzzy Cognitive Mapping. *Information Sciences,* 169, 131-159.

Dolnicar, S., & Jordaan, Y. (2007). A Market-Oriented Approach to Responsibly Managing Information Privacy Concerns in Direct Marketing. *Journal of Advertising,* 36 (2), 123-149.

Eden, C. (1998). Cognitive Mapping. *European Journal of Operation Research,* 36, 1-13. Hasiloglu, S.B. (2007). *ElektronikPosta He Pazarlama (E-mail marketing).* Istanbul: Beta Yaymevi. Hughes, M.A. (1960). *The Coplete Database Marketer.* Chicago: IRWIN Professional Publishing.

Hussain, M., & Perttula, W. (2006). The Benefits and Effective Application of Audio in Direct Marketing on the Internet. *Journal of Internet Commerce,* 5 (1), 87-100.

Kandasamy, W.B.V., & Smarandache, F. (2003). Fuzzy *Cognitive Maps and Neutrosophic Cognitive Maps.* USA, Phoenix: Publishing Online Co. Xiquan, 2003.

Karson, E., & Korgaonkar, P. (2001). The Broadened Concept of Direct Marketing Advertising. *Marketing Management Journal,* 11(1), 82-93.

Keane, T, & Wang, P. (1995). Applications for the Lifetime Value Model in Modern Newspaper Publishing. *Journal of Direct Marketing, 9* (2), 59-66.

Kotler, P., & Armstrong, G. (1998). *Principles of Marketing.* New Jersey: Prentice Hall.Co.

MacDonald, N. (1983). *Trees and Networks in Biological Models.* New York: John Wiley and Sons, 1983 from: Ozesmi, U., & Ozesmi, L. (2004). Ecological models based on people's knowledge: a multi-step fuzzy cognitive mapping approach. Ecological Modeling, 176, 43-64.

Marinova, A., Murphy, J., & Massey, B.L. (2002). Permission E-mail Marketing as a Means of Targeted Promotion. *Cornell Hotel & Restaurant Administration Quarterly,* 43(1), 61-69.

Mehta, R., & Sivadas, E. (1995). Direct Marketing on the Internet: An Empirical Assessment of Consumer Attitudes. *Journal of Direct Marketing,* 9 (3), 21-32.

Mehta, R., Grewal, R., & Sivadas, E. (1996). International Direct Marketing on the Internet: Do Internet Users Form a Global Segment? *Journal of Direct Marketing,* 10 (1), 45-58.

Melville, N., Stevens, A., Plice, R.K., & Pavlov, O.V. (2006). Unsolicited Commercial E-Mail: Empirical Analysis of a Digital *Commons. International Journal of Electronic Commerce,* 10(4), 143-168.

Morimoto, M., & Chang, S. (2006). Consumers' Attitudes toward Unsolicited Commercial E-mail and Postal Direct Mail Marketing Methods: Intrusiveness, Perceived Loss of Control, and Irritation. *Journal of Interactive Advertising, 1* (1), 8-20.

Nakip, M., & Gedikli, C. (1996). Dogrudan Pazarlama ve Sebeke Yoluyla Pazarlama Sistemi (Direct marketing and network marketing system). *Pazarlama Dunyasi Dergisi,* 59, 2-15.

Odabasi, Y, & Oyman, M. (2001). *Pazarlama Ileti§imi Yonetimi.* Istanbul: MediaCat.

Ozesmi, U. (1999). *Conservation Strategies for Sustainable Resource use in the Kizihrmak Delta in Turkey.* Minnesota: University of Minnesota Ph.D. Thesis from: Coban, O., & Secme G. (2005). Prediction of socio-economical consequences of privatization at the firm level with fuzzy cognitive mapping. Information Sciences, 169, 131-159.

Ozesmi, U., & Ozesmi, L. (2004). Ecological Models Based on People's Knowledge: A Multi-Step Fuzzy Cognitive Mapping Approach. *Ecological Modelling,* 176, 43-64.

Passavant, P. A. (1984). *Direct Marketing Strategy. The Direct Marketing Handbook.* New York: McGraw-Hill Book Company.

Rizzi, J. (2001). Precision E-Mail Marketing. *Direct Marketing,* 64 (7), 56-60.

Roxas, M.L., Peek, L., Peek, G, & Hagemann, T. (2000). A Preliminary Evaluation of Professional Accounting Services: Direct Marketing on the Internet. *Journal of Services Marketing,* 14 (6/7), 595-606.

Tapp, A. (2002). Proactive or Reactive Marketing? The Influence of the Internet on Direct Marketing. *Journal of Database Marketing, 9* (3), 238-247.

Tapscott, D. (1996). *The Digital Economy.* New York: McGraw-Hill.

Verhoef, P.C., Spring, P.N., Hoekstra, J.C., & Leeflang, P.S.H. (2003). The Commercial Use of Segmentation and Predictive Modelling Techniques for Database Marketing in the Netherlands. *Decision Support Systems,* 34 (4), 471 -481.