Design of Fuzzy Cognitive Mapping Model of Factors Affecting Personalized Advertising in the Sporting Goods Industry

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ABSTRACT

Purpose: This study was the design of a fuzzy cognitive mapping model of factors affecting personalized advertising in the sporting goods industry.

Methodology: The primary research method of this paper, the descriptive-exploratory study, was semi-structured interviews with the informed and expert individuals who were active in the intended domain of the study. Sampling was done using snowball sampling to select participants from among the Specialists in sports marketing, sports brand, and sports industry and university professors in Sports Management, Business Management, Technology management who had the intended characteristics. After conducting 14 interviews and collecting data, the obtained data were coded. After summarizing and theming the issues raised by the experts, seven main indicators and 33 Sub-indices were obtained in personalized advertisements in the sporting goods industry. Then, based on the knowledge of experts, the relationships between concepts were drawn in the form of fuzzy cognition maps. Excel, FCMapper, and FCM EXPERT software were used to draw fuzzy cognitive maps and calculate the related indicators.

Findings: According to the table, customer relationship management is the most affected by other factors. Also, the research results showed that Customer Knowledge Management has the most significant impact on the factors of the ad personalization model. Customer relationship management, Clustering customers, and Customer Knowledge Management, respectively, have the highest degree of centrality; this means that they have the most impact on the model.

Originality: In this study, we examined the development of a fuzzy cognitive mapping model of factors affecting personalized advertising in the sporting goods industry that has not been studied so far.

1. Introduction

The Internet, social media, mobile applications, and other digital communication technologies have become part of the billion people's daily lives. For example, the current level of Internet use between adults is about 87% and closer to 100% for demographic groups, such as adults with higher education and higher revenue (Ziyadin et al., 2019). Social media promotion uses social systems, social systems, weblog promotion, and more. It is the newest "buzz" in advertising. Social media promotion uses social systems, social systems, weblog promotion, and more. It's the newest "buzz" in advertising (Sajid, 2016). International corporations have distinguished Community Press Marketing as a potential promotion system and used them with enhancements to expand their marketing via social media promotion (Sajid, 2016). advertising is simply one way that consumers learn about new products, as no one prefers to make poor choices when it comes to purchasing. Social media provides many innovative options more than poor or just many choices (Evans, 1989). Advertising is an example of a simple way consumers know about new products; thus, no one prefers to make poor choices when it comes to purchasing. Social media enable many smart choices more than poor or just many choices (Evans, 1989). Sketching a suitable advertising strategy is a challenging issue since (i) displaying too many ads, or inappropriate ads will decline user experience and engagement, and on the other hand, (ii) displaying bad ads will lessen the advertising revenue of the platforms. In real-world platforms, ads are mostly displayed with commonly recommended items. Recommend and advertising strategies are typically developed by various departments and optimized by different techniques with different metrics (Feng et al., 2018). Online advertising is a kind of advertising that leverages the internet to deliver promotional marketing messages to consumers (Zhao et al., 2021).

Advertising is a key in the business model of many online services (O'Donnell & Cramer, 2015). Advertisers try to personalize internet advertising because advertisers tailor content to individual users (Jai et al., 2013). Internet advertising has become increasingly personalized as advertisers tailor content to individual users (Zhu & Chang, 2016). Personalization aims to make ads more adapted for users and more efficient for advertisers (O'Donnell & Cramer, 2015). Personalized advertisement seeks to cater to each individual's specific interests and style (Zhu & Chang, 2016). Providing personalized advertising has become one of the hottest trends in online retailing (Turban et al., 2010). As consumers share a great deal of personal information on social network sites, marketers can use this information to personalize their advertising messages on social network sites to a great extent (De Keyzer et al., 2015). Personalization and contextualized targeting aim to relevant advertising to individual users by adapting ads to user behavior, feature, and user context. However, the relationship between users and personalized and contextualized ads is complex (O'Donnell & Cramer, 2015). Ads can be adapted using implicit user behavior (e.g. based on searches, link clicks, and dwell-time) and frank feedback (e.g. likes, ratings). This can increase engagement and ad effectiveness (Yan et al., 2009). For example, Meng et al., 2016 demonstrated that mobile ads delivered by Google are heavily personalized based on user's interests and demographic information. More than 57% of ad impressions for 41% of the users match user's real fondness. More

than 73% of ad impressions for 92% of users accordance with user's demographic information (Meng et al., 2016). Personalized advertising offers remarkable cost efficiencies for marketers in compare of traditional mass media advertising as it allows for the distribution of highly tailored commercial messages to individual consumers who have been identified as permanent consumers (Kim et al., 2001).

Schumann et al. (2014) defined irrelevant advertising as boring and useless for users, and consumers consider them unworthy of paying more attention. They argue that OPA is a social exchange between consultants and their users. Social exchange theory proposes that consumers estimate social interactions based on perceived cost and rewards. This subjective estimation causes behaviors where people only take part in a societal exchange when their expected return is greater than or at least compensated by, the cost of participation (Schumann et al., 2014). Ur et al (2012) understood that participants were more convenient with advertising based on behavioral tracking if they knew and reliable the internet firm that allowed such ads. However, users are not always informed of personalized advertising, and also they do not entirely perceive how such personalization works (Ur et al., 2012). Zhu and Chang (2016), based on rational choice theory and self-awareness theory, explored the role of relevance in personalized advertisements and examined its impact on perceptions of privacy invasion, self-awareness, and subsequent continuous use intentions of personalized advertising (Zhu & Chang, 2016). Analysis of survey data from 386 online users found that although privacy invasion perceptions are negatively related to constant use intentions, perceived advertisement relevance mitigates consumers' privacy concerns.

Perceived relevance was also positively related to consumers' continuous use intentions through the mediation of self-awareness (Zhu & Chang, 2016). Vesanen and Raulas (2006) show how seeing personalization as a process helps marketers manage and execute it more efficiently. A process view shows how the various phases of personalization—customer interactions, analyses of customer data, customization based on customer profiles, and targeting of marketing activities—are connected (Vesanen & Raulas, 2006). The conclusions of investigations have shown that personalization is associated with higher customer loyalty and satisfaction (Ball et al., 2006).

The commercialization of the sports industry has international economic and social implications (Sarlab & Seyed Ameri, 2021). The sports industry is one of the essential bases for economic development and social improvement, which has played an exciting and crucial role in the sports economy and even the growth of the national economy. The sports industry is the emergence of a modern human economy in the form of a new industrial economy, which is the most diverse industry in the world of business, and economically, as an essential factor of the regeneration of the national economy in many countries (Hadian et al., 2020). Modern-day sport, and thus the sports industry itself, should consist of activities aimed at promoting public welfare for each country (Savić et al., 2018). Sport has many functions: social, health, educational, entertainment, recreational, economic, compatibility, integration, and defense (Stryczek, 2011). Sport is an inseparable element of our daily life, and because of universality, people, social groups, nations, and societies can communicate without considering their differences. Not only

the sport's popularity but also its multidimensionality, some of the inherent attributes, intense feelings, and the excellent efficiency of ads are surrounded (Kończak, 2021).

According to the World Federation of Sporting Goods Industries, China has become the most extensive sporting goods production base by producing 70% of the world's sporting products. Sportswear and equipment take up 80% of China's sports industry in China. Recently, the successful holding of the Beijing Olympic Games and Guangzhou, the Asian Games, has enormously rumble the speedy development of the sporting goods industry (Ran & Zhang, 2011). Therefore, the sporting goods industry has the necessary potential and capacity for commercial growth, and in the meantime, advertising strategy is more significant in this field. Pihl (2006) emphasizes cyberspace and e-commerce in the marketing and branding of sports goods in today's world (Pihl, 2006). Considering the economic impact of personalized advertising in today's world and the capacity of the sports industry, the need for this issue is essential. So, the present study seeks to answer the question of what is the model of personalized advertising in the sporting goods industry? And what are the influential factors for this model? We hope the results of this research will help marketers and sports managers in advertising and brand management.

2. Methodology

This study developed a fuzzy cognitive mapping model of factors affecting personalized advertising in the sporting goods industry using qualitative method and grounded theory based on Glaser's approach and is based on fuzzy cognitive mapping approach. The main research instrument of this pure, descriptive-exploratory study was semi-structured interviews with the informed and expert individuals who were active in the intended domain of the study. Sampling was done using snowball sampling to select participants from among the Specialists in sports marketing, sports brand, and sports industry and university professors in Sport Management, Business Management, Technology management who had the intended characteristics. After conducting 14 interviews and collecting data, the obtained data were coded.

FCMs constitute a structured modeling technique used in complex systems (Papageorgiou et al., 2009). Predictions on systems performance are made through a semi-quantitative or semantic assessment of the relationships between concepts. An FCM can be described as a qualitative model that portrays how a given system operates (Özesmi & Özesmi, 2004). The qualitative model describes the system in terms of its component variables and the causalities among these variables (Park & Kim, 1995). An FCM is a directed network (i.e., diagraph) composed of nodes or concepts used to describe system behavior and edges representing the causal links between ideas. Each concept (node) has a state variable that varies from 0 to 1. It is associated with an activation variable (i.e., {0} means no-activate and means activate). Each link has an associated real number or weight variable from $-1, 1$, reflecting the relationship "what-if" between concepts (Papageorgiou et al., 2009). An FCM connection matrix is encoded from each FCM as deeply with the fitted connection weights. The main elements of an FCM are nodes or concepts $\{C1, C2,\dots, Cn\}$; directed edges $\{C1C2,$

etc.} as a set of directed arcs that represent the relationship (positive or negative) between concepts. Adjacency matrix (Ec = eij) as a matrix that contains the values of each relationship (the values belong to the interval from −1, conversely correlated, and 1, directly correlated) and state vector A = (a1, a2, …, an). Where an is a real number between 0 and 1, from which the categorical concept status is obtained: 1 activate or 0 no-activate (Papageorgiou et al., 2009). Cognitive maps are compounds of a large number of variables (one per concept) that have many interconnections and feedback cycles. The direction and numbers of relationships between variables produce three concepts: transmitter concepts, receiver concepts, and ordinary concepts (Eden et al., 1992; Harary & Norman, 1965). The type of variables in a map is important because it shows the relationships among these variables and facilitates an understanding of its structure. Graph theory indices provide a way to characterize FCM structures utilizing three indices: outdegree, indegree, and the centrality index (Özesmi & Özesmi, 2004).

Once the stakeholder and expert group interviews were conducted, we obtained an individual FCM from each participant. These individual cognitive maps were augmented and additively superimposed (Kosko, 1986, 1993) to generate the aggregate map. Several different methods to aggregate the individual maps (van Vliet et al., 2017) have advantages and disadvantages. In this case, each personal map was combined to generate a group or social map (Mouratiadou & Moran, 2007). For that, each individual matrix was augmented and added, producing a single matrix that represents the FCM. Then, the final aggregated FCM was obtained by normalizing each adjacency matrix element according to the number of experts who supported it, k, and their decisional weight, pi (Eq. (1))

Banini and Bearman (1998) :(1) $Ec = \sum_{i=1}^{k} p_i E_i / k$ Where k represents the number of experts interviewed; pi is the decisional weight of the expert i, where $\sum_{i=1}^{k} p_i = 1$; Ec is the aggregated connection matrix, and Ei is the connection matrix written by the expert i. The use of decisional weight pi for calculating each adjacency matrix element allows a freedom degree for generating new scenarios under different social contexts. The procedure for creating the FCMs are shown in Figure 1 (Rodriguez-Repiso et al., 2007).
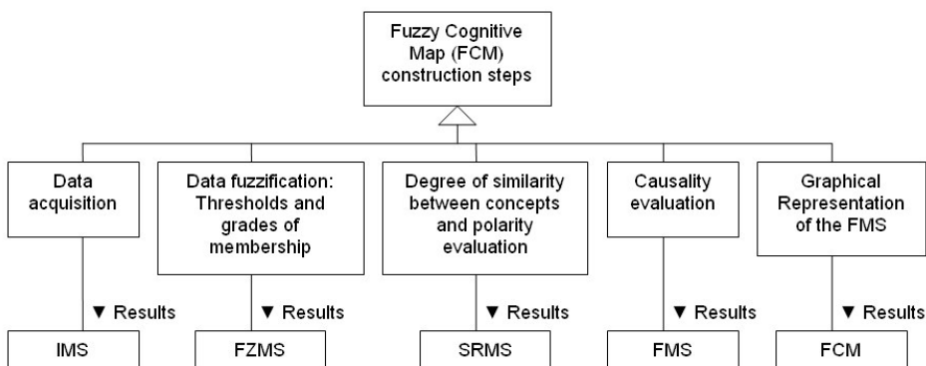

Figure 1. Procedure for creating a targeted FCM (Rodriguez-Repiso et al., 2007).

Excel, FCMapper and FCM EXPERT software were used to draw fuzzy cognitive maps and calculate the related indicators.

3. Results

In the current study, the grounded theory based on Glaser's approach has been used for explaining the Process of sports development in Iran. The demographic data of the 14 experts interviewed in the current study are presented in Table 1.

Table 1. Demographic data of the interviewees.

	Category	Frequency	Percentage of frequency
Gender	Men	10	71.42%
	Women	4	28.57%
Field of study	Sport management	8	57.14%
	Business Management	4	28.57%
	Technology management	2	14.28%
Education	PhD	12	85.72%
	Masters	2	14.28%

By reviewing the totality of the interviews conducted during the analysis and review of scientific sources, 33 concepts (sub-categories) and 7 Core categories were obtained. Table 2 show Coding output for other main categories.

Table 2. Coding output for other main categories.

Core categories	Concepts
Customer Knowledge Management	Gain knowledge about the customer
	Provide knowledge to the customer
	Acquire knowledge from the customer
Clustering customers	Clustering based on purchasing behavior (level, amount and sensitivity)
	Clustering based on demographic characteristics
	Clustering based on interest rate
	Clustering based on Brand Preference
Customer relationship management	A comprehensive system for receiving customer information
	customer-advertiser relations
	customer reward and participation
	Analyzing customers buying behavior online
	Meetings and Certifications
Psychology of Advertising	Advertising space
	individual differences and attitudinal reactions
	Engage the consumer mind
	customer emotion and advertisement characteristics
	Neuroscientific (hemodynamic activity, eye movements, psychometric responses, etc.)
convergence of advertising	Convergence of advertising content with consumer needs
	Convergence of advertising culture with customer culture
	Social convergence of advertising with the social level of customers
	Economic convergence of advertising with the economic conditions of customers

Core categories	Concepts
	real-time advertising adjustment to the user
	Context and product attributes for message customization
	Create impactful content and distribute it to audience-aligned destinations.
Visual attention	Curiosity-inducing advertising
	Celebrities or Champion Athletes in Advertisements
	Use signs of nostalgia
	use of humorous advertising
	Informed Consent Statement
	Based on obtaining permission
Transparency of privacy policies	Transparency and customer awareness
	Provide clear instructions
	Guaranteed Preservation Privacy

After the collection of interviews, the results were defuzzied and entered in the FCM EXPERT software to draw the FCM and calculate the following:

- Total number of components.
- Total number of connections.
- Indegree and Outdegree of each component.
- Connections per component.
- Type of component (driver, ordinary, receiver).
- Centrality: an absolute value of either a) overall influence in the model (all + and relationships indicated, for entire model (or b) influence of individual concepts as indicated by positive (+) or negative (-) values placed on connections between components; shows a) the total influence (positive and negative) to be in the system or b) the conceptual weight/importance of individual concepts (Kosko, 1986, 1993). The higher the value, the greater is the importance of all concepts or the individual weight of a concept in the overall model1.
- C/N: number of connections divided by the number of variables (concepts).
- Complexity: ratio of receiver variables to transmitter variables.
- Density: connections number compared to all possible connections numbers (Kokkinos et al., 2018).
- The De-fuzzy matrix of the factors affecting the structured personal advertisements is shown in Table 3.

Table 3. De-fuzzy matrix of experts' cognitive map.

	c1	c2	c3	c4	c5	c6	c7
c1	0	0.240531	0.37923	0.398706	0.516737	0.444957	0.154399
c2	0.180894	0	0.345666	0.113968	0.444176	0.522554	0.180236
c3	0.346288	0.180706	0	0.246954	0.444636	0.516501	0.345796
c4	0.509574	0.094023	0.345743	0	0.313014	0.509598	0.18031
c5	0.51021	0.346061	0.247518	0.18102	0	0.444948	0.346037
c6	0.510346	0.11471	0.313602	0.181151	0.445027	0	0.313235
c7	0.574577	0.587607	0.463674	0.509328	0.444141	0.658887	0

To examine and analyze the causal map of experts, the similarity and distance between the causal map of experts are examined using analytical tools. These analyses determine whether there is a specific pattern on the similarity or difference between maps and the feasibility of integrating causal maps of experts to extract integrated cognitive mapping. QAP correlation method and distance ratio index are used to measure the similarity and distance of nine expert maps (Rezaei Pandari, 2015).

Table 4 shows the calculated pairwise matrix for the cognitive map of the experts in this study.

Table 4. Matrix paired distance matrix of cognitive experts.

```
Input dataset:                       similarity6 (C:\Users\MEHDI\Desktop\FCM\test4\similarity6
Measure:                             Avg absolute difference
Mode:                                Matrices
Diagonal valid?:                     YES
Output dataset:                      similarity-Avg-M6 (C:\Users\MEHDI\Desktop\FCM\test4\similarity-Avg-M6


                 1     2     3     4     5     6     7     8     9    10
               expr1 expr2 expr3 expr4 expr5 expr6 expr7 expr8 expr9 expr1
                                                                       0

               ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
  1  expr1        0 0.197 0.254 0.183 0.312 0.114 0.218 0.128 0.243 0.161
  2  expr2    0.197     0 0.217 0.317 0.283 0.198 0.367 0.265 0.179 0.242
  3  expr3    0.254 0.217     0 0.276 0.312 0.299 0.164 0.227 0.254 0.173
  4  expr4    0.183 0.317 0.276     0 0.198 0.223 0.171 0.279 0.241 0.374
  5  expr5    0.312 0.283 0.312 0.198     0 0.389 0.258 0.311 0.325 0.343
  6  expr6    0.114 0.198 0.299 0.223 0.389     0 0.234 0.218 0.247 0.326
  7  expr7    0.218 0.367 0.164 0.171 0.258 0.234     0 0.314 0.385 0.217
  8  expr8    0.128 0.265 0.227 0.279 0.311 0.218 0.314     0 0.229 0.173
  9  expr9    0.243 0.179 0.254 0.241 0.325 0.247 0.385 0.229     0 0.298
 10  expr10   0.161 0.242 0.173 0.374 0.343 0.326 0.217 0.173 0.298     0

10 rows, 10 columns, 1 levels.
```

In the next step, the QAP correlation coefficient matrix was calculated. The output of this analysis is a square matrix (table) that shows the correlation of expert drawings in pairs.

Table 5. QAP correlation.

```
QAP Correlations

                1      2      3      4      5      6      7      8      9     10
             expr1  expr2  expr3  expr4  expr5  expr6  expr7  expr8  expr9 expr10
             ------ ------ ------ ------ ------ ------ ------ ------ ------ ------
 1  expr1    1.000  0.351  0.258  0.211  0.395  0.321  0.278  0.491  0.359  0.217
 2  expr2    0.351  1.000  0.334  0.319  0.355  0.191  0.463  0.229  0.167  0.361
 3  expr3    0.258  0.334  1.000  0.328  0.198  0.236  0.164  0.129  0.145  0.315
 4  expr4    0.211  0.319  0.328  1.000  0.376  0.418  0.113  0.159  0.139  0.219
 5  expr5    0.395  0.355  0.198  0.376  1.000  0.108  0.233  0.112  0.331  0.336
 6  expr6    0.321  0.191  0.236  0.418  0.108  1.000  0.273  0.298  0.118  0.187
 7  expr7    0.278  0.463  0.164  0.113  0.233  0.273  1.000  0.237  0.427  0.381
 8  expr8    0.491  0.229  0.129  0.159  0.112  0.298  0.237  1.000  0.274  0.265
 9  expr9    0.359  0.167  0.145  0.139  0.331  0.118  0.427  0.274  1.000  0.183
10 expr10    0.217  0.361  0.315  0.219  0.336  0.187  0.381  0.265  0.183  1.000
```

Table 6. P-Values/ QAP correlation.

```
QAP P-Values

                1      2      3      4      5      6      7      8      9     10
             expr1  expr2  expr3  expr4  expr5  expr6  expr7  expr8  expr9 expr1
             -----  -----  -----  -----  -----  -----  -----  -----  -----  -----
 1  expr1    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 2  expr2    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 3  expr3    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 4  expr4    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 5  expr5    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 6  expr6    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 7  expr7    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 8  expr8    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
 9  expr9    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
10 expr10    0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000

QAP statistics saved as datafile QAP Correlation Results
```

Examination of the results related to correlation analysis (similarity data) and distance ratio (difference data) between cognitive maps shows no significant difference between them. Therefore, there is no obstacle to integrating the cognitive maps of all experts in model development. Table 7 Showed Indicators of fuzzy cognitive mapping method.

Table 7. Indicators of fuzzy cognitive mapping method.

Density	Total Nr. Factors	Total Nr. Connections	Nr. Transmitter	Nr. Receiver	Nr. Ordinary	Nr. Regular Connections
0.77	7	42	0	0	7	42.0

Density shows how highly the factors are connected within the network. It was calculated by dividing the number of counted connections (C) by the number of possible connections between N factors. According to the results of Table 7, a density of 0.77 indicates that the system is highly complex. The density of a cognitive map D is an index of connectivity. $D = C / N (N - 1)$ or alternatively $D = C / N 2$. This is known as the density equation wherein C represents the number of connections possible between N variables; if the number of connections possible between N variables can have a

causal effect on themselves, then the minimum number of connections is N^2. Transmitter variables are units whose od(vi) is positive, and their id(vi) is 0. Receiver variables are units whose od(vi) is 0, and their id (vi) is positive. Other variables which have both non-zero od (vi) and id (vi) are ordinary variables (mean). According to Table 4, the number of transmitters in the system is zero, and the receivers are zero in the system. The results also showed that all model factors are of the type of ordinary variables (Kandasamy & Smarandache, 2003).

The degree of output, the degree of input and the degree of centrality of each factor are analyzed in FCMapper software. These results are shown in Table 8.

Table 8. The degree of input, the degree of output and the centrality of each factor.

	Factors	Outdegree	Indegree	Centrality	Rank
C1	Clustering customers	2.13	2.63	4.77	2
C2	Transparency of privacy policies	1.79	1.56	3.35	7
C3	Psychology of Advertising	2.08	2.10	4.18	5
C4	Visual attention	1.95	1.63	3.58	6
C5	convergence of advertising	2.08	2.61	4.68	4
C6	Customer relationship management	1.88	3.10	4.98	1
C7	Customer Knowledge Management	3.24	1.52	4.76	3

The structure of an FCM, apart from the number of variables and connections, can best be analyzed by finding the following variables:

For a given FCM, the transmitter variables (forcing, giving, tails, independent) are the receiver variables (ends, heads, dependent). These variables are defined by their outdegree [od(vj)] and indegree [id(vj)]. Outdegree is the row sum of absolute values of a variable in the adjacency matrix and shows the cumulative strengths of connections (aij) exiting the variable (Kandasamy & Smarandache, 2003).

$$od(v_j) = \sum_{k=1}^{N} \bar{a}_{jk}$$

Indegree is the column sum of absolute values of a variable and shows the cumulative strength of variables entering the unit.

$$id(v_j) = \sum_{k=1}^{N} \bar{a}_{kj}.$$

The immediate domain is the summation of its in-degree (narrows) and outdegree (out arrows), also called centrality. The contribution of a variable in a cognitive map can be understood by calculating its centrality (c), whether it is a transmitter, receiver, or ordinary variable. The centrality (c) of a variable is also called its total degree [td(vi)] (Kandasamy & Smarandache, 2003).

$$c_i = td(v_i) = od(v_i) + id(v_i).$$

According to the table results, Customer relationship management is the most affected by other factors. Also, the research results showed that Customer Knowledge Management has the most significant impact on the factors of the ad personalization model. As can be seen, Customer relationship management, Clustering customers, and Customer Knowledge Management, respectively, have the highest degree of centrality. The graphical representation of the inter-relationship between the nodes is given in the form of a directed graph shown in Figure 2.
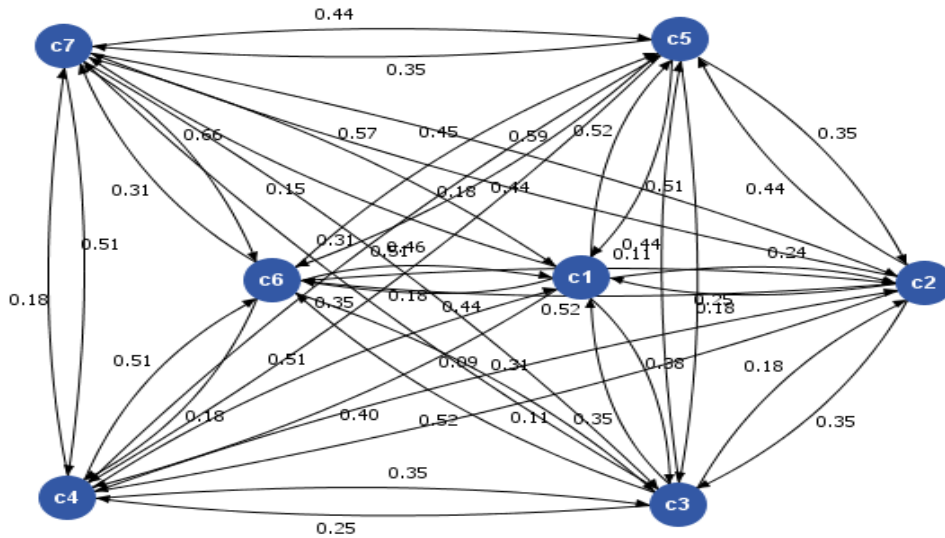
Figure 2. Cognitive mapping of factors affecting personalized advertising in the sporting goods industry.

4. Discussion and conclusion

This article was the development of a fuzzy cognitive mapping model of factors affecting personalized advertising in the sporting goods industry using qualitative method and grounded theory based on Glaser's approach and is based on fuzzy cognitive mapping approach. The main research instrument of this pure, descriptive-exploratory study was semi-structured interviews with the informed and expert individuals who were active in the intended domain of the study. The research results showed that Customer relationship management is the most affected by other factors. Also, the research results showed that Customer Knowledge Management has the most significant impact on the factors of the ad personalization model. Customer relationship management, Clustering customers, and Customer Knowledge Management, respectively, have the highest degree of centrality; this means that they have the most impact on the model.

In today's fast-moving world of marketing, from product orientation to customer orientation, the management of customer treatment can be seen as a key to achieving revenue growth and profitability. Knowledge of customer behavior can help marketing

managers re-evaluate their strategies with the customers and plan to improve and expand their application of the most effective strategy (Hosseini & Shabani, 2015). Customer segmentation is the process of dividing customers into groups with similar characteristics or features. Customer behavior analysis and customer segmentation are mainly based on customer demographic variables (Song et al., 2001). Clustering and segmentation are two of the most critical marketing and customer-relationship management techniques. They use customer-purchase transaction data to track buying behavior and create strategic business initiatives (Rajagopal, 2011). Therefore, knowing the customer information will help a lot in personalizing advertisements.

Also, Psychologists from many different specialties, particularly cognitive, media, and social psychologists, have been interested in advertising from many points of view (Furnham, 2019). In all advertising campaigns, essential decisions lead to failure or success. In all of these decisions, psychologists do research advertising and present their knowledge to make marketing more effective. They consider the following factors Ad Features, Repetition, Price, and Channel. Directed is also essential. For example, we must use the Internet or mobile phones for advertising if we want to target teenagers. In addition, given their age, we can support their identity. This is the most critical issue at this age. The integration of customer information and the science of psychology is based on various components (mentioned) to formulate ads based on customer tastes and interests.

Furthermore, compiling convergent advertising messages in different dimensions is very important in personalizing advertisements. These dimensions include the convergence of advertising content with consumer needs, the intersection of advertising culture with customer culture, the social convergence of advertising with the social level of customers, and the economic convergence of advertising with the economic conditions of customers. In personalizing advertising, all aspects of an individual in society are taken into account. Therefore, marketers must consider social, cultural, and economic characteristics in the formulation of personalized advertisements related to sporting goods.

Since a significant last of the budget is spent on advertisements that lack effectiveness, essential elements should be investigated to increase ads' effectiveness and avoid wasting expenditure (Keimasi & Khoshnevis, 2021). Visual advertising is one of the most widely used methods in marketing that uses graphic elements to increase brand awareness in the audience. The use of colors, the effect of direct gaze, the impact of friendly communities, attention to the focal point, and the rule of a third of the points that pay attention to them are effective in the success of visual advertising campaigns. In this regard, the following can be used to personalize ads: curiosity-inducing advertising, celebrities or champion Athlete in advertisements, use signs of nostalgia, context, and product attributes for message customization, create impactful content, and distribute it to audience-aligned destinations and use of humorous advertising.

Customer knowledge is a critical asset, and gathering, managing, and sharing customer knowledge can be a valuable competitive activity for organizations (Garcia-Murillo & Annabi, 2002). Customer knowledge can be broadly categorized as knowledge for customers (i.e., knowledge provided to customers to satisfy their needs),

knowledge about customers, and knowledge from customers, which is the knowledge that customers possess that organizations can obtain by interacting with them (Khodakarami & Chan, 2014). also, Customer relationship management (CRM) systems are a group of information systems that enable organizations to contact customers and collect, store and analyze customer data to provide a comprehensive view of their customers. CRM systems mainly fall into three categories: operational systems (used for automation and increased efficiency of CRM processes), analytical systems (used for the analysis of customer data and knowledge), and collaborative systems (used to manage and integrate communication channels and customer interaction touchpoints) (Bose & Sugumaran, 2003; Geib et al., 2006).

It is well understood that such personalization is only possible if certain user information (e.g. interests, demographic information) is available to the party that serves advertisements. Thus privacy leakage is always a concern (Meng et al., 2016). On the other hand, customers may find online personalization helpful because personalized promotions cater to their preference—the value of personalization. On the other hand, customers may feel uncomfortable and anxious when they learn of their unauthorized personal information (van Vliet et al., 2017). Also, ad networks are responsible for protecting users' privacy (Meng et al., 2016). Baek and Morimoto (2012) research on advertising avoidance identified two critical triggers for consumers' negative attitudes toward personalized advertisements: (1) when the message is not well-targeted to their needs and interests, and (2) when the message raises issues of privacy concern (Baek & Morimoto, 2012).

Dynamic targeting and retargeting are the facets of personalized advertisements where companies utilize users' browsing behavior to predict their interests and purchase patterns to target them better. Relevance plays a key role here since lesser relevance or uses to the user would often result in negative emotion towards the personalized ads (De Keyzer et al., 2015). Hence, utilizing relevance and usefulness ensures that users are hooked better and reduces the companies' costs of customer search and acquisition. Practically, we can replace personalization with bearing as any brand/product advertised outside the interests and needs has meager chances of generating an intrinsic urge to buy the product/brand. Our findings that the customer purchase intention positively correlates to the relevance and usefulness metric of personalized advertisements on social media are concurrent with several other studies.

As a result, considering the importance of personalized advertising and realizing that customers want to be meaningful even in advertising, suggestions are provided in this regard. This type of advertising may be complex at first, but with a bit of creativity and the right tools, it can be instilled in customers that your interests and desires are really important and there is no need to change their minds. Using data analysis platforms can provide accurate information about how the customer operates and make analyzing that data more accessible. Data management platforms also contain platforms that inform audiences and campaigns and help marketers manage them when needed. This information may include age, family income, web browsing habits, shopping behavior, location, a device used, and other details of users and can be categorized and differentiated in various ways. Customer relationship has become one of the main pillars

in personal advertising. To this end, choosing an accurate tool to create an optimized connection with customers based on the data obtained is essential for success. Email marketing platforms are one of the main digital marketing tools. If this email also looks good enough to be personalized, you are more likely to respond to it. Finally, it should be noted that personalized advertising is different from traditional advertising and seeks to improve the customer experience. With the right strategy and the right tools for this type of advertising, you will achieve a mutually enjoyable experience.

Disclosure statement and funding

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تدوین مدل نگاشتی شناختی فازی عوامل مؤثر بر تبلیغات شخصی سازی شده در صنعت کالاهای ورزشی

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چکیده

هدف: این پژوهش به تدوین مدل نگاشتی شناختی فازی عوامل مؤثر بر تبلیغات شخصی‌سازی شده در صنعت کالاهای ورزشی با استفاده از روش کیفی و نظریه زمینه‌ای بر اساس رویکرد گلیزر و مبتنی بر رویکرد نگاشتی شناختی فازی است.

روش: ابزار اصلی این پژوهش توصیفی-اکتشافی، مصاحبه نیمه ساختاریافته با افراد آگاه و خبره فعال در حوزه مورد نظر بود. نمونه‌گیری با استفاده از گلوله برفی برای انتخاب شرکت‌کنندگان از بین متخصصان بازاریابی ورزشی، برندهای ورزشی و صنعت ورزش و اساتید دانشگاه در رشته‌های مدیریت ورزشی، مدیریت بازرگانی، مدیریت فناوری که دارای ویژگی‌های مورد نظر بودند، انجام شد. پس از انجام ۱۴ مصاحبه، داده‌های به دست‌آمده کدگذاری شد. پس از جمع‌بندی موضوعات مطرح شده توسط کارشناسان، ۷ شاخص اصلی و ۳۳ زیرشاخص در تبلیغات شخصی سازی شده در صنعت لوازم ورزشی به دست آمد. سپس بر اساس دانش صاحب‌نظران، روابط بین مفاهیم در قالب مدل نگاشتی شناختی فازی ترسیم شد. برای ترسیم مدل شناختی فازی و محاسبه شاخص‌های مربوطه از نرم‌افزارهای Excel، FCMapper و FCM EXPERT استفاده شد.

یافته‌ها: بر اساس نتایج، مدیریت ارتباط با مشتری بیشترین تأثیر را از سایر عوامل می‌پذیرد. همچنین، نتایج تحقیق نشان داد که مدیریت دانش مشتری بیشترین تأثیر را بر عوامل مدل شخصی‌سازی تبلیغات دارد. مدیریت ارتباط با مشتری، مشتریان خوشه‌بندی و مدیریت دانش مشتری به ترتیب دارای بالاترین درجه مرکزیت هستند. این بدان معنی است که آن‌ها بیشترین تأثیر را بر روی مدل دارند.

اصالت و ابتکار مقاله: در این مطالعه، به تدوین مدل نگاشتی شناختی فازی عوامل مؤثر بر تبلیغات شخصی‌سازی شده در صنعت کالاهای ورزشی بررسی شد که تاکنون مطالعه‌ای بر روی آن انجام نشده است.

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