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# A Concurrent Optimization of Knowledge Sharing and Customer Loyalty in Social Media under a Digital Marketing Approach

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**Abstract**

The present study has presented an intelligent integrated model for simultaneously optimizing knowledge sharing and customer loyalty in social networks with a digital marketing approach. In this research, first, the components of knowledge sharing, customer loyalty, and digital marketing are identified from the research literature, and then the research data has been collected using standard questionnaires with 5 Likert spectra for all three variables and a questionnaire of AHP method from an Iranian IT-based company. Research processes include the AHP method (to calculate the weights of the loyalty criteria to use in the mathematical model), and a new two-objective mathematical model (to simultaneously optimization of knowledge sharing and customer loyalty). The results of the hybrid approach using data collected from a company active in the field of digital marketing in Tehran showed that the relationship between customer loyalty and knowledge sharing has a significant positive effect of 47.6%. The results of regression analysis also showed that there is a positive and significant relationship between knowledge sharing and customer loyalty under the digital marketing approach of 53.1%. AHP analysis showed that protest behavior and purchase intention are the most important components of customer loyalty. Coding and running the proposed two-objective mathematical model in GAMS Software provided a level of optimization in which the full knowledge shared with the maximum customer loyalty was achieved.

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## Extended Abstract

### Introduction

In today's complex and ambiguous environments, globalization, new changes in financing structures and changes in supply and demand conditions in the context of online business have caused organizations to pay special attention to knowledge management to maintain, grow and provide better services in their environment (Basherpour and et al, 2018). For this purpose, one of the most important tools for the continuous creation of knowledge is sharing it among all units and members of the organization with an emphasis on technology and social interaction, which plays an important role in the survival of the organization in the competitive environment (Ronan and et al, 2020). Especially in organizations that have online marketing, the production and dissemination of knowledge are of particular importance (Sadeghi & Soltani, 2018). On the other hand; Customers are a special aspect of the success of any organization. Therefore, organizations need to share knowledge with their customers (Dehdashti & Bashirpour, 2018). In this regard, one strategy is to conduct more empirical studies, define more precise variables and explore their interactive relationships in specialized subjects such as social networks (Arab ghomi & nili AhmadAbadi, 2015). Because today social networks play a vital role in sharing knowledge and the platform of these networks is a reality of today's human world, and it is possible to obtain a detailed map of action strategies in this field by means of scientific approaches (Ivala & Gachago, 2012). Now although social networks offer a new potential for people to share their knowledge with others, a model has not yet been presented that minimizes the cost of sharing knowledge and maximizes shared knowledge (in normal mode and under maximum customer loyalty) provide an optimization in costs and the amount of shared knowledge. Therefore, this research attempts to answer this question: "How to simultaneously optimize knowledge sharing and customer loyalty in social networks with a digital marketing approach?"

### Theoretical framework

Topics related to knowledge sharing, digital marketing, social networks, and customer loyalty are topics that have been studied a lot. Table (1) shows a general summary of some of this research.

| writers | Year | The method used in the research | Analysis results |
|---|---|---|---|
| Muzahid Akbar and Noorjahan | 2009 | Structural equation modeling (SEM) | Customer trust and satisfaction have a meaningful and positive relationship with customer loyalty. Also, customer satisfaction is an important mediator between perceived service quality and customer loyalty. |
| Irem and Cicek | 2012 | The questionnaire, multiple regression analysis | Customer loyalty has a positive effect on the brand. |
| Michel et al | 2014 | Structural equation modeling | Business communities based on social networks have positive effects on customers/products, customers/brands, customers/companies, and customer/other customer relationships. |

| | | | |
|---|---|---|---|
| Dafna et al | 2020 | face-to-face interview, statistical analysis (SPSS) | Knowledge creation and knowledge targeting behaviors are related to different functional goals (or needs) of users. |
| Boban et al | 2020 | Purposeful sampling, statistical analysis | The more a company relies on the use of digital marketing in its business, the more significant its impact on brand promotion and positioning. |
| Yong Jin and Sang Jung | 2020 | Machine learning models, business intelligence | Deep learning provides the best accuracy in predicting the level of engagement. |
| Tong Cheb and Yanga | 2020 | Partial least squares path modeling | Buyers with strong social relationships with sellers have higher purchase frequency than those with weak social relationships. |
| Haesebrouck et al | 2021 | Cronbach's alpha, structural equations, Amos software | People do not fail to transfer personal knowledge when there is a reward, but they refrain from transferring maximum knowledge when there is no reward. |
| Bozkurt And Gligor | 2021 | Confirmatory factor analysis, SAMRTPLS software | Customers who praise the service provider publicly (vs. privately) on social media before the service failure, to be satisfied with the service provider and return to the service provider, need a higher level of service recovery. |
| Dolega et al | 2021 | New combined algorithm | Social networks lead to increased web traffic, but not significant increases in product orders and sales revenue. |
| Arrigo et al | 2021 | Mathematical modeling, statistical analysis | Through the statistical analysis, significant relationships were discovered between marketing communication media and user profiles. |

## Methodology

In this research, an intelligent decision-making model is presented to simultaneously optimize knowledge sharing and customer loyalty in the context of social networks under the digital marketing approach. Hence; first, the indicators of knowledge sharing and customer loyalty are identified using research literature. Then, the research data is collected using standard questionnaires with a 5-point Likert scale for all three variables and a special questionnaire for the AHP method from an IT- oriented company. The research processes will include descriptive statistics analysis, regression test (estimating the relationship between variables as one-to-many) in SPSS software; and AHP analysis (determining the weight of loyalty sub-criteria) in Expert Choice software. Also, a double-objective mathematical model (maximization of shared knowledge in normal mode and with the presence of customer loyalty plus minimization of knowledge sharing costs) has been presented and coded; and solved in Games software to simultaneously optimize knowledge sharing and customer loyalty in social networks.

## Discussion and Results

In this research, by using previous research, the components of knowledge sharing, customer loyalty, and digital marketing were first identified from the research literature. After identifying the sub-criteria of each criterion; by using standard questionnaires with a 5-point Likert scale, data related to three problem variables; and by using a questionnaire specific to the AHP method, the data required for this method were collected from an Iranian IT-oriented company. Research processes included: descriptive statistics analysis, regression test (estimation of the relationship between variables) in SPSS software, and AHP analysis (determining the weight of loyalty sub-criteria) in Expert Choice software. In addition; A double-objective mathematical model for the optimization of knowledge sharing and customer loyalty in social networks was presented for the first time and the model was coded and solved in Games software. The research findings are described in three categories:

1) The results of the regression test showed that there is a positive and meaningful relationship of 47.6% between customer loyalty and knowledge sharing, and a 47.25% relationship between digital marketing and knowledge sharing. Also, the results of the regression analysis showed that there is a positive and significant relationship between knowledge sharing and customer loyalty under the digital marketing approach at the rate of 53.1%.

2) AHP findings showed that the most important loyalty criteria include: Verbal marketing, purchase intentions, price sensitivity, and protest behavior with weights of: 0.055, 0.238, 0.149, and 0.557, respectively.

3) The findings of coding and implementation of the proposed multi-objective mathematical model showed that if it is focused on the customer loyalty index along with knowledge sharing, a greater degree of simultaneous optimization is obtained between these two variables. It is possible to achieve better performance by maximizing the amount of knowledge sharing and customer loyalty under digital recovery approaches.

## Conclusion

The current research was conducted to simultaneously optimize knowledge sharing and customer loyalty in social networks under the digital marketing approach. To achieve this goal, after studying the subject literature and extracting the required criteria and foundations, the research processes were carried out in three stages. The research findings confirmed that knowledge sharing has a positive and significant relationship with customer loyalty and digital marketing. More importantly, the sharing of knowledge and customer loyalty under the digital marketing approach has more than 50% direct, positive, and meaningful impact. Therefore, the optimization of knowledge sharing and customer loyalty at the same time can have a significant effect on improving performance and increasing the efficiency of a group with digital marketing. The management of this effect and how to optimize it together was presented by a multi-objective mathematical model and investigated in a case study in this research.