




The Impact of Economic Changes on Digital Marketing Patterns in the Geotourism Industry of Mazandaran

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Abstract

The geotourism industry, as a subset of the tourism sector, is significantly influenced by economic changes and digital marketing patterns. This study aims to examine the impact of economic changes on digital marketing patterns in the geotourism industry of Mazandaran Province. This study adopts a descriptive-analytical approach and employs quantitative methods. Data were collected through the distribution of structured questionnaires among 50 experts and practitioners in the tourism industry of Mazandaran. The statistical population included all experts and managers related to the geotourism industry as well as tourists in the region. To analyze the data, the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) multi-criteria decision-making model was utilized to assess the extent to which the counties of Mazandaran Province have benefited from economic changes and digital marketing patterns. The results indicated that Neka County, with the highest final score (18113.89) and ranking first, is the most successful county in leveraging economic changes and implementing effective digital marketing strategies. In contrast, Ramsar and Babol counties, ranked 16th and 15th, respectively, face more challenges in this regard. Additionally, Sari, Miandorud, Babolsar, and Fereydunkenar counties were identified as regions with strong potential for attracting tourists. These findings enable decision-makers and geotourism industry practitioners to identify the strengths and weaknesses of each county and formulate more optimal strategies for improving economic conditions and enhancing digital marketing activities. Ultimately, this research can contribute to the sustainable development of the geotourism industry in Mazandaran.

Keywords: Consumption patterns, digital marketing, economic changes, geotourism, Mazandaran.

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Introduction

Globally, economic changes significantly impact digital marketing patterns in the geotourism industry. Particularly during periods of economic crisis, reduced purchasing power and shifts in consumer behavior necessitate that businesses revise their strategies to attract and retain customers [1]. On the one hand, during economic booms, increased interest in travel and tourism creates new opportunities for innovation in digital marketing [2], enabling businesses to enhance their communication with customers through modern tools such as targeted advertising, content marketing, and data analytics [3]. On the other hand, during economic recessions, companies must adopt more cost-effective and creative strategies to remain competitive, optimizing digital channels to provide personalized and engaging customer experiences. These changes highlight the ongoing need for adaptation to evolving economic conditions and the utilization of advanced technologies to attract and retain tourists in the geotourism industry [4].

Supportive theories argue that economic changes can have a direct positive impact on digital marketing patterns in the geotourism industry [5]. For instance, during economic booms, increased per capita income and consumer purchasing power can lead to higher demand for tourism and related services [6]. In this context, digital marketing serves as an effective tool for attracting new customers and retaining existing ones [7]. By leveraging digital strategies such as targeted social media advertising, businesses can accurately meet tourist demands and deliver personalized experiences that enhance customer satisfaction [8]. Conversely, opposing theories emphasize that economic changes can negatively impact digital marketing patterns. During economic downturns, declining purchasing power and rising unemployment rates may reduce demand for travel and tourism [9]. In such circumstances, many businesses seek to cut costs, potentially reducing investments in digital marketing. Moreover, competition among businesses to attract a limited number of customers intensifies, leading to decreased innovation and diversity in digital marketing strategies [10].

Additionally, some theories highlight the mixed effects of economic changes on digital marketing patterns. These perspectives suggest that the impact of economic fluctuations on digital marketing depends on specific market conditions and the type of services offered [11]. For example, in unfavorable economic conditions, businesses can utilize cost-effective and creative strategies such as

content marketing and social media engagement to maintain customer relationships and enhance loyalty. In such cases, even during economic recessions, digital marketing can serve as an efficient tool for sustaining customer engagement and attracting attention [12].

Economic changes play a crucial role in shaping digital marketing strategies across various industries, including geotourism. Mazandaran, as a major tourism destination in Iran, known for its pristine nature and geotourism attractions, requires effective marketing strategies that align with prevailing economic conditions. This issue becomes particularly important as economic fluctuations directly influence consumer behavior and decision-making regarding travel and tourism [7]. One of the ambiguous aspects in this field is the extent to which economic changes impact digital marketing patterns. For instance, during economic downturns, demand for tourism may decline, necessitating adjustments in digital marketing strategies. Conversely, during economic booms, increased demand for travel may intensify market competition, requiring further innovation in marketing methods. These contradictions and challenges necessitate a more detailed examination [13].

The variables associated with this research include economic changes (such as unemployment rate, per capita income, inflation, etc.) and digital marketing patterns (such as social media utilization, search engine optimization, content marketing, etc.) [14]. Additionally, consumer behavior and preferences are considered key variables in this study. Ultimately, understanding these variables can help identify new trends and patterns in digital marketing [15].

Examining the effects of economic changes on digital marketing patterns in the geotourism industry is essential due to the high significance of tourism in the local economy and the need for adaptation to evolving economic conditions [16]. Understanding these effects can help businesses design more effective strategies for attracting and retaining customers under different economic conditions [17]. Furthermore, this topic can contribute to identifying innovative opportunities and enhancing the tourism experience in Mazandaran. In this regard, analyzing the impact of economic changes on consumer behavior and digital marketing patterns in the geotourism industry of Mazandaran can reveal new opportunities and challenges in this field [18]. Particularly in a tourism market heavily influenced by economic factors, gaining precise insights into these effects can assist decision-makers in implementing more effective strategies for attracting tourists.

Previous studies have shown that economic changes, such as fluctuations in unemployment rates and per capita income, significantly impact the demand for tourism services and digital marketing strategies. Research conducted in various regions indicates that businesses must innovate their marketing methods and utilize digital tools to remain competitive in response to economic shifts. Given Mazandaran's importance as a key tourism destination in Iran and its unique geotourism features, further research is required to better understand the economic impacts on digital marketing patterns and consumer behavior in this industry. This investigation can help identify new opportunities and challenges in attracting tourists and optimizing marketing strategies. Rezaei and Azami (2021) examined the impact of electronic marketing on the promotion and development of the tourism industry in Hamedan using a descriptive-survey approach. Their study, which included 200 valid questionnaires collected from tourism officials and visitors, found that electronic marketing directly influenced the enhancement and development of Hamedan's tourism industry by 47%, demonstrating its crucial role in tourism improvement [19]. Similarly, Haksoro et al. (2024) analyzed social media marketing strategies to enhance the appeal of tourism attractions in Karanganyar. Using qualitative methods and data collection from natural sites and relevant agencies, they identified key attractions and proposed improvements in marketing and infrastructure. Their findings suggest that effective promotion through Instagram could significantly boost tourism in Karanganyar [20]. Moreover, Molokac et al. (2023) highlighted the critical role of online marketing in attracting visitors to tourism destinations, particularly geoparks, in the post-COVID-19 era. Their study assessed the available information on geopark websites, revealing that while these sites provide sufficient general information, they lack well-structured product packages, online sales, and the use of emerging social media platforms. The study emphasized the need for professionalizing geopark marketing and improving their management to enhance tourism engagement [21].

The central research question is: "How do economic changes affect digital marketing patterns in the geotourism industry of Mazandaran?" This question seeks to explore the relationship between economic conditions and digital marketing methods and analyze the findings to improve marketing strategies in this sector.

1. Methodology

The Mazandaran region, located in northern Iran, is recognized as one of the major geotourism destinations due to its diverse geography, rich natural and cultural attractions, and temperate climate, which draw numerous tourists. This region, featuring the Alborz Mountains, dense forests, lakes, and the picturesque shores of the Caspian Sea, offers unique opportunities for tourism and ecotourism activities. The geotourism attractions of Mazandaran include natural sites such as Golestan National Park, numerous waterfalls, and traditional villages with rich cultural heritage and handicrafts, providing visitors with a unique experience.

The development of geotourism in Mazandaran is considered an effective strategy for attracting tourists and boosting the local economy. Given the existing potential, attention to environmental conservation and local culture, alongside the development of tourism infrastructure, can enhance the tourist experience and increase their satisfaction. Furthermore, the use of modern technologies and digital marketing can promote Mazandaran's geotourism attractions, transforming the region into an appealing destination for both domestic and international tourists. Ultimately, collaboration between the government, local communities, and the private sector can contribute to the sustainable development of this industry, creating new opportunities for employment and revenue generation.

Mazandaran Province, with its diverse counties including Amol, Babol, Babolsar, Behshahr, Tonekabon, Abbasabad, Juybar, Chalous, Ramsar, Sari, Savadkuh, Qaemshahr, Mahmudabad, Neka, Noor, Nowshahr, and Galugah, is recognized as one of the leading destinations in the geotourism industry. These counties, each with their own unique natural attractions such as mountains, coastlines, forests, and rushing rivers, provide exceptional opportunities for attracting tourists. The environmental and cultural diversity of each county can significantly contribute to the sustainable development of geotourism, offering visitors a distinctive experience of nature and local traditions. Given the economic importance of this industry and its role in attracting tourists, it is crucial to preserve the environment and local culture while simultaneously developing tourism infrastructure.

The research methodology employed in this study follows a descriptive-analytical approach, utilizing quantitative data collection methods. Data were gathered through the distribution of structured questionnaires among experts and practitioners in the tourism industry of Mazandaran. The statistical population includes all experts and managers associated with the geotourism industry in Mazandaran, as

well as tourists visiting the region. The sample size was determined to be 50 individuals, selected through purposive convenience sampling.

To analyze the data, the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) multi-criteria

decision-making model was used to assess the extent to which the counties of Mazandaran Province have benefited from economic changes and digital marketing patterns in the development of the geotourism industry. Figure 1 presents the conceptual model of the research.

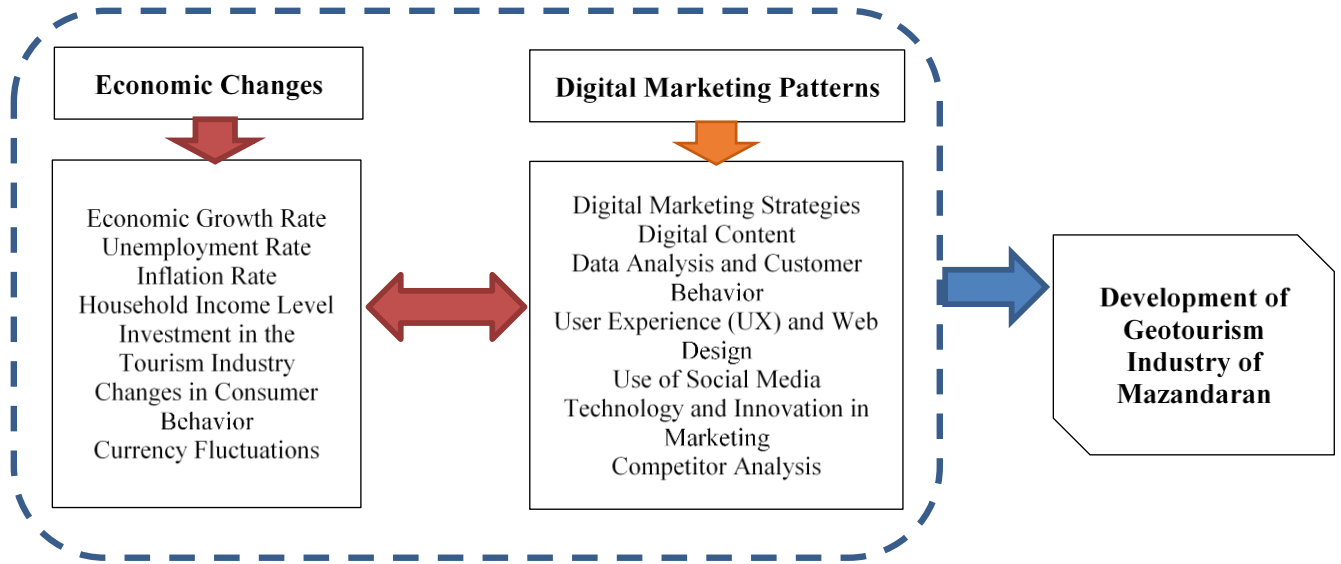


Figure 1. Conceptual Model of the Research

2. Findings and Results

This section analyzes the results of examining the impact of economic changes on digital marketing patterns in the geotourism industry of Mazandaran. This analysis identifies the challenges and opportunities arising from economic transformations and the strategic responses of businesses to these changes. Additionally, the obtained results can provide effective solutions for optimizing digital marketing processes in this industry.

2.1. Evaluation of Economic Changes in Mazandaran Province Concerning the Geotourism Industry

Evaluating economic changes in the counties of Mazandaran Province in relation to the geotourism industry

involves assessing the reciprocal effects of economic factors on the growth and prosperity of this sector. The increase in tourism-generated revenue, job creation in local communities, and the development of necessary infrastructure such as hotels, restaurants, and recreational facilities are among the positive outcomes of these economic changes. Moreover, economic fluctuations can pose challenges such as decreased investment and instability in attracting tourists. Therefore, analyzing these changes and identifying their associated opportunities and threats can assist in strategic decision-making to optimize geotourism activities and ensure sustainable development across the counties of Mazandaran Province.

Table 1. Decision-Making Matrix for Economic Changes

County	EC1	EC2	EC3	EC4	EC5	EC6	EC7
Amol	3.49	0.3911	0.4191	211.60	26379	38208	17.18
Babol	1.15	0.1655	0.062	62.40	7522	59823	14.65
Babolsar & Fereydunkenar	2.26	0.4422	0.4974	190.50	34438	58195	23.76
Behshahr	1.67	0.4966	0.3110	144.10	36704	680396	5.15
Tonekabon & Abbasabad	1.74	0.099	0.1996	81.80	14562	92665	4.29
Juybar	1.79	0.1379	0.1379	62.90	24258	108087	21.38
Chalous & Kalardasht	0.79	0.1581	0.0790	31.80	3396	45318	31.86
Ramsar	0.28	0.1425	0.0000	14.20	1977	67884	38.48

Sari & Miandorud	1.52	0.1952	0.31	176.80	33380	65513	18.54
Savadkuh & Northern Savadkuh	1.43	0.5722	0.8583	191.90	34364	512410	37.48
Qaemshahr & Simorgh	0.78	0.098	0.3614	100.00	16084	72916	10.77
Mahmudabad	0.32	0.1068	0.5343	153.00	10507	152432	28.42
Neka	0.36	0.4598	0.3678	157.30	38623	8875	12.50
Noor	1.19	0.091	0.3670	78.40	8616	182227	30.00
Nowshahr	1.63	0.5724	0.1635	95.60	12806	10088	6.90
Galugah	0.24	0.0000	0.0000	11.81	396.19	2585.50	1.70

Table 1 presents the decision-making matrix regarding economic changes in the counties of Mazandaran Province, facilitating an analysis of the impact of these changes on digital marketing patterns in the geotourism industry. Each county is characterized by different values across economic criteria (EC1 to EC7), encompassing variables such as income, expenditures, and other economic factors. For example, counties such as Savadkuh and Northern Savadkuh, with high economic values, demonstrate greater

potential for developing digital marketing strategies and attracting more tourists. In contrast, counties with lower economic indicators, such as Galugah and Ramsar, may face challenges in attracting tourists and implementing digital technologies. Thus, analyzing this matrix helps identify the strengths and weaknesses of each county concerning digital marketing and the sustainable development of geotourism, guiding strategic planning for improved performance in this sector.

Table 2. Ideal Matrix for Economic Changes

Ideal Matrix	EC1	EC2	EC3	EC4	EC5	EC6	EC7
V+	0.191	0.024	0.142	16.620	2654.191	44285.785	1.571
V-	0.001	0.000	0.000	0.052	0.279	0.639	0.003

Table 2 presents the ideal matrix related to economic changes in Mazandaran Province, comprising two data sets, V+ and V-. These data sets help identify optimal and unfavorable economic conditions concerning the geotourism industry. The V+ values represent optimal conditions for each economic index (EC1 to EC7) and can serve as developmental targets for counties. For example, for indicators such as tourism-related income and expenditures, these values can function as benchmarks for enhancing

digital marketing strategies. Conversely, the V- values indicate unfavorable economic conditions that should be minimized. This analysis aids managers and planners in identifying the gap between the current state and the ideal condition, enabling the formulation of effective strategies to improve digital marketing patterns in the geotourism industry, ultimately enhancing tourism attractions and increasing the sector's economic share.

Table 3. County Ranking Matrix of Mazandaran Province in Response to Economic Changes

Ranking Matrix	D+	D-	CL	Rank
Amol	44168.839	1245.716	45414.555	4
Babol	44017.562	356.161	44373.722	11
Babolsar & Fereydunkenar	43965.167	2134.558	46099.734	2
Behshahr	257.356	44349.954	44607.310	7
Tonekabon & Abbasabad	43523.952	903.244	44427.196	9
Juybar	43198.092	1530.769	44728.861	5
Chalous & Kalardasht	44167.916	196.871	44364.786	15
Ramsar	43924.798	440.249	44365.046	14
Sari & Miandorud	43880.349	2024.198	45904.547	3
Savadkuh & Northern Savadkuh	19176.285	25204.548	44380.833	10
Qaemshahr & Simorgh	43832.115	685.315	44517.430	8
Mahmudabad	42134.766	2230.780	44365.547	12
Neka	44278.251	2653.937	46932.188	1
Noor	41186.455	3178.723	44365.178	13
Nowshahr	44339.032	291.670	44630.701	6
Galugah	44364.599	0.012	44364.611	16

Table 3 ranks the counties of Mazandaran Province based on their response to economic changes and the impact on digital marketing patterns in the geotourism industry. Notably, Neka ranks highest with the lowest negative score (D-), demonstrating its strong capacity to attract tourists and effectively leverage digital marketing potential.

2.2. *Evaluation of Digital Marketing Patterns in the Counties of Mazandaran Province in Relation to the Geotourism Industry*

The evaluation of digital marketing patterns in the counties of Mazandaran Province concerning the geotourism industry focuses on analyzing the methods and strategies

employed to attract and engage tourists. Given the rapid growth in internet and social media usage, leveraging digital tools such as websites, online advertisements, and visually appealing content has become essential for success in this industry. This assessment includes identifying the strengths and weaknesses of current digital marketing patterns, examining the behavior and needs of the target audience, and analyzing the impact of these methods on tourist attraction and awareness of the natural and cultural attractions of each county. Ultimately, this analysis can contribute to optimizing digital marketing strategies and enhancing the tourist experience in the geotourism industry.

Table 4. Decision-Making Matrix for Digital Marketing Patterns

County	DM1	DM2	DM3	DM4	DM5	DM6	DM7
Amol	0.009	3.4	13.98	22.31	3.03	42352	28.40
Babol	0.015	5.0	13.72	41.58	1.86	50598	49.90
Babolsar & Fereydunkenar	0.0107	4.8	15.64	34.23	1.95	760211	95.00
Behshahr	0.0102	6.3	17.04	30.49	1.55	60704	37.90
Tonekabon & Abbasabad	0.027	3.7	17.05	163.50	1.84	22400	33.70
Juybar	0.011	3.7	20.12	36.88	5.34	354336	38.77
Chalous & Kalardasht	0.025	4.3	19.65	103.54	2.38	7429	42.80
Ramsar	0.016	2.7	17.25	127.37	6.29	107762	87.90
Sari & Miandorud	0.012	3.6	18.00	44.70	2.23	152170	27.98
Savadkuh & Northern Savadkuh	0.004	4.1	14.96	43.66	7.70	168320	68.52
Qaemshahr & Simorgh	0.007	4.7	16.18	46.43	0.87	718770	25.60
Mahmudabad	0.016	3.7	15.10	46.50	0.94	87878	88.20
Neka	0.008	4.3	14.50	23.14	0.40	117560	66.50
Noor	0.015	3.8	16.30	44.00	6.52	97901	64.30
Nowshahr	0.020	3.3	17.70	118.60	3.65	25122	26.90
Galugah	0.010	4.3	15.50	20.80	4.46	0	0.00

Table 4 presents the decision-making matrix for digital marketing patterns in the counties of Mazandaran Province, illustrating the impact of economic changes on these patterns. The various variables (DM1 to DM7) represent diverse indicators such as costs, return on investment, and tourist attraction rates, aiding in the evaluation of the effectiveness of digital marketing strategies. Notably, counties such as Babolsar & Fereydunkenar and Ramsar, with high values in DM6 and DM7, exhibit strong potential in leveraging economic changes and improving digital

marketing activities. In contrast, Galugah, with low scores across all indicators, faces challenges in this area. These findings assist decision-makers and geotourism industry stakeholders in identifying each county's strengths and weaknesses, formulating more effective strategies for attracting tourists, and implementing digital marketing techniques. Ultimately, the positive impact of economic changes on these patterns can contribute to the sustainable development of the geotourism industry in Mazandaran.

Table 5. Ideal Matrix for Digital Marketing Patterns

Ideal Matrix	DM1	DM2	DM3	DM4	DM5	DM6	DM7
V+	0.002	0.460	0.509	11.675	0.642	94942.000	3.827
V-	0.000	0.084	0.236	0.189	0.002	0.000	0.000

Table 5 contains the ideal matrix for digital marketing patterns in the geotourism industry of Mazandaran, specifically addressing the impact of economic changes on

these patterns. In this matrix, the values V+ and V- represent the best and worst possible conditions for various digital marketing indicators. The V+ values, as ideal benchmarks,

indicate optimal performance levels that can be achieved through improved economic conditions and efficient resource utilization. For instance, in DM6, which pertains to return on investment, the ideal value of 94942.000 reflects high potential for capital and tourist attraction under optimal conditions. Conversely, the V- values signify the lowest levels of performance, helping to identify weaknesses in current digital marketing patterns. This analysis aids

decision-makers in Mazandaran’s geotourism industry in recognizing the gap between the current state and the ideal condition, allowing for the development of effective strategies for improvement and growth. Ultimately, achieving the ideal state can enhance the overall performance of the geotourism industry and increase tourist attraction in Mazandaran.

Table 6. County Ranking Matrix of Mazandaran Province in Response to Digital Marketing Patterns

Ranking Matrix	D+	D-	CL	Rank
Amol	94647.32945	294.67158	94942.00102	14
Babol	94521.41281	420.58966	94942.00248	9
Babolsar & Fereydunkenar	11.18315	94942.00012	94953.18328	1
Behshahr	94336.62548	605.37577	94942.00125	12
Tonekabon & Abbasabad	94859.56995	83.22812	94942.79807	3
Juybar	74315.73400	20626.26696	94942.00096	15
Chalous & Kalardasht	94932.93362	10.15284	94943.08646	2
Ramsar	93034.25059	1907.76490	94942.01549	6
Sari & Miandorud	91137.93374	3804.06709	94942.00083	16
Savadkuh & Northern Savadkuh	90287.62409	4654.37714	94942.00123	13
Qaemshahr & Simorgh	10068.92657	84873.07985	94942.00642	7
Mahmudabad	93673.32559	1268.67959	94942.00518	8
Neka	92671.56494	2270.43661	94942.00155	11
Noor	93367.42214	1574.57974	94942.00188	10
Nowshahr	94838.31943	103.85235	94942.17179	5
Galugah	94942.00082	0.25842	94942.25924	4

Table 6 ranks the counties of Mazandaran Province based on their response to digital marketing patterns and the effects of economic changes on these strategies. Babolsar & Fereydunkenar, with a D+ score close to the ideal value and ranked first, demonstrates strong capability in leveraging economic opportunities and attracting tourists through effective digital marketing strategies.

2.3. The Development Level of the Geotourism Industry in Mazandaran Province

The geotourism industry in Mazandaran Province, as one of Iran's key natural and cultural tourism destinations, possesses significant potential for development. Given the

province’s geographical, climatic, and cultural diversity, natural attractions such as mountains, seas, forests, and historical and cultural sites serve as primary resources for attracting tourists. In recent years, with increasing attention to sustainable tourism and ecotourism, geotourism in Mazandaran has also gained more prominence. However, this industry still faces challenges such as a lack of adequate infrastructure, ineffective marketing, and the need for training and improving local skills in tourism services. To achieve sustainable development in this sector, precise planning for investment in infrastructure, workforce training, and tourism culture promotion is necessary so that Mazandaran Province can be recognized as a leading national and international geotourism destination.

Table 7. County Values Based on Research Criteria

County	Economic Changes	Digital Marketing Patterns
Amol	45414.555	94942.00102
Babol	44373.722	94942.00248
Babolsar & Fereydunkenar	46099.734	94953.18328
Behshahr	44607.310	94942.00125
Tonekabon & Abbasabad	44427.196	94942.79807
Juybar	44728.861	94942.00096
Chalous & Kalardasht	44364.786	94943.08646
Ramsar	44365.046	94942.01549

Sari & Miandorud	45904.547	94942.00083
Savadkuh & Northern Savadkuh	44380.833	94942.00123
Qaemshahr & Simorgh	44517.430	94942.00642
Mahmudabad	44365.547	94942.00518
Neka	46932.188	94942.00155
Noor	44365.178	94942.00188
Nowshahr	44630.701	94942.17179
Galugah	44364.611	94942.25924

Table 7 illustrates the values of counties in Mazandaran Province based on two criteria: "economic changes" and "digital marketing patterns," depicting the mutual effects of these two factors on the geotourism industry. According to the data, Neka County, with the highest value in economic changes (46932.188) and comparable scores in digital marketing patterns, indicates effective utilization of economic opportunities and successful implementation of strategies to attract tourists through digital marketing. Additionally, Babolsar & Fereydunkenar, with a high economic change value of 46099.734 and a strong digital marketing score, reflects the region's strong potential in this

industry. Conversely, counties such as Juybar and Sari & Miandorud, which have relatively lower economic change scores, may face challenges in implementing digital marketing strategies aligned with economic fluctuations. These findings can assist decision-makers and geotourism industry stakeholders in identifying the strengths and weaknesses of each county, enabling them to formulate appropriate strategies to improve economic conditions and strengthen digital marketing activities. Ultimately, the positive correlation between economic changes and digital marketing patterns can contribute to the sustainable development of the geotourism industry in Mazandaran.

Table 8. The Development Level of the Geotourism Industry in the Counties of Mazandaran Province

County	Final Value	Rank
Amol	17923.91	4
Babol	17792.92	15
Babolsar & Fereydunkenar	18009.99	2
Behshahr	17824.84	7
Tonekabon & Abbasabad	17800.28	9
Juybar	17851.96	5
Chalous & Kalardasht	17793.27	14
Ramsar	17792.09	16
Sari & Miandorud	17984.88	3
Savadkuh & Northern Savadkuh	17797.21	11
Qaemshahr & Simorgh	17812.2	8
Mahmudabad	17799.63	10
Neka	18113.89	1
Noor	17794.39	12
Nowshahr	17826.43	6
Galugah	17794.00	13

Table 8 presents the development level of the geotourism industry in the counties of Mazandaran Province based on the final value and ranking of each county, clearly illustrating the impact of economic changes on digital marketing patterns. Neka County, with the highest final value (18113.89) and ranked first, demonstrates the success of this region in leveraging economic changes and implementing effective digital marketing strategies. In contrast, counties such as Ramsar and Babol, ranked 16th and 15th respectively, with lower final values, indicate more challenges in this domain, potentially due to a lack of alignment between economic changes and digital marketing strategies. Counties such as Sari & Miandorud and Babolsar

& Fereydunkenar, which rank among the top counties, highlight their strong potential in attracting tourists and utilizing economic opportunities.

These findings can aid decision-makers and geotourism industry stakeholders in identifying the strengths and weaknesses of each county, allowing them to formulate optimized strategies for improving economic conditions and strengthening digital marketing activities. Ultimately, this will contribute to the sustainable development of the geotourism industry in Mazandaran.

3. Discussion and Conclusion

The findings of this study highlight the significant impact of economic changes on digital marketing patterns in the geotourism industry of Mazandaran Province. The results indicate that Neka, with the highest final value (18113.89), is the most successful county in leveraging economic changes and implementing effective digital marketing strategies. Similarly, Babolsar & Fereydunkenar and Sari & Miandorud, with high rankings, demonstrate strong capacities for integrating economic opportunities into digital marketing initiatives. In contrast, counties such as Ramsar and Babol, which ranked lower, face more challenges in adapting to economic fluctuations through digital marketing. These variations suggest that while economic changes present opportunities for some regions, others may struggle due to inadequate infrastructure, weak digital marketing strategies, or economic instability. Additionally, the strong correlation between economic changes and digital marketing success suggests that counties that actively invest in marketing innovation and infrastructure development are better positioned to attract tourists and sustain geotourism growth.

These results align with previous studies that emphasize the role of digital marketing in sustaining tourism industries amid economic fluctuations. Rezaei and Azami (2021) demonstrated that electronic marketing directly contributes to the promotion and development of tourism, as their study in Hamedan found that digital marketing had a 47% direct impact on tourism growth [19]. This finding supports the current study's results, suggesting that investments in digital marketing can significantly enhance the competitiveness of tourism destinations, particularly during economic transitions. Additionally, the findings are consistent with the study by Haksoro et al. (2024), which emphasized the importance of social media marketing in strengthening tourism appeal. Their research on Karanganyar identified key natural attractions and proposed improvements in marketing strategies, demonstrating that an effective online presence can enhance visitor engagement [20]. Similarly, this study found that counties with strong digital marketing frameworks performed better in economic adaptation, confirming that social media and other digital tools are essential for modern tourism development.

Further, the role of digital marketing in tourism recovery, particularly in post-crisis periods, is highlighted by Molokac et al. (2023). Their research showed that geoparks, despite offering rich natural resources, lacked sufficient digital marketing strategies such as structured product packages, online sales, and engagement through modern social media

platforms [21]. These insights align with the current study's findings, which indicate that some counties in Mazandaran, despite their geotourism potential, are underperforming due to weak digital marketing initiatives. For example, Ramsar and Babol, which ranked lower in digital marketing success, may face similar challenges to those observed in geoparks, such as insufficient online promotion, limited engagement with tourists through digital platforms, and weak integration of economic opportunities into marketing strategies. The findings suggest that unless digital marketing infrastructures are improved, these counties may continue to lag behind in geotourism growth despite their potential.

The study also confirms the need for innovative marketing strategies to respond to economic changes. This is supported by Haksoro et al. (2024), who found that implementing targeted social media campaigns helped promote Karanganyar's tourism attractions more effectively [18]. Likewise, the findings of this study indicate that counties that embraced digital innovation performed significantly better in responding to economic fluctuations. For instance, Neka and Babolsar & Fereydunkenar ranked higher due to their active use of digital marketing tools, reinforcing the idea that tourism destinations must integrate digital strategies into their economic development plans. Similarly, Molokac et al. (2023) highlighted that many geoparks fail to optimize digital marketing, leading to weaker visitor engagement [21]. This supports the current study's findings that some counties in Mazandaran have not fully capitalized on digital marketing to mitigate economic impacts.

The strong correlation between economic changes and digital marketing strategies suggests that tourism destinations with well-developed marketing infrastructure are better equipped to adapt to economic fluctuations. This aligns with previous studies that indicate the necessity of digital tools in tourism management. Rezaei and Azami (2021) found that electronic marketing significantly contributed to tourism promotion, which supports this study's conclusion that investing in digital platforms is crucial for geotourism success [19]. Moreover, the findings are in agreement with Molokac et al. (2023), who emphasized that digital engagement strategies, including social media and interactive websites, are essential for tourism industry growth [21].

These findings contribute to the growing body of research advocating for digital marketing as a key factor in tourism development. The study confirms that economic changes shape the effectiveness of digital marketing strategies,

emphasizing the need for strategic investments in technology and infrastructure. The results highlight that counties performing well economically tend to have stronger digital marketing frameworks, reinforcing the interdependence between economic adaptation and marketing success. This study extends previous research by offering a region-specific analysis of how economic changes impact digital marketing within geotourism, providing valuable insights for policymakers, tourism operators, and digital marketing professionals.

This study has several limitations that should be acknowledged. First, the research was conducted within Mazandaran Province, limiting the generalizability of the findings to other regions with different economic structures and tourism dynamics. While the study provides valuable insights, applying these findings to other geotourism destinations should be done with caution. Second, the study primarily relied on quantitative data, which, while effective for measuring correlations and ranking counties, may not fully capture the qualitative aspects of digital marketing effectiveness. Future research incorporating qualitative interviews with tourism stakeholders could provide a deeper understanding of the underlying factors influencing digital marketing success. Additionally, external factors such as government policies, environmental conditions, and global economic trends were not extensively analyzed, though they may significantly impact geotourism and digital marketing performance.

Future research should consider a broader geographical scope to determine whether the observed trends in Mazandaran hold true for other geotourism destinations. Comparative studies between regions with varying levels of digital marketing investment could offer more comprehensive insights into best practices. Additionally, integrating qualitative methodologies, such as interviews and case studies, would provide a more nuanced perspective on the challenges and opportunities in digital marketing for geotourism. Examining the role of emerging technologies, such as artificial intelligence and virtual reality, in enhancing digital marketing strategies for tourism destinations could also be a valuable area of investigation. Moreover, future studies should explore the long-term effects of economic changes on digital marketing, assessing how tourism destinations can develop sustainable strategies to mitigate economic downturns.

To enhance the effectiveness of digital marketing in the geotourism industry, tourism authorities and businesses in Mazandaran should prioritize investment in digital

infrastructure. This includes developing user-friendly websites, engaging social media campaigns, and integrating e-commerce functionalities to enhance visitor experiences. Training programs should be implemented to equip local tourism operators with digital marketing skills, ensuring they can effectively promote their attractions in competitive markets. Additionally, collaboration between local governments, tourism agencies, and digital marketing firms can facilitate the creation of targeted marketing strategies tailored to economic conditions. Sustainable tourism practices should also be emphasized, ensuring that digital marketing efforts align with environmental conservation and cultural preservation goals. By adopting these strategies, Mazandaran can strengthen its position as a leading geotourism destination while effectively responding to economic changes.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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