

Prioritizing MarTech Capabilities That Enhance Customer Experience in Embedded Finance Platforms Using AHP

Pınar Yücel^{1*}, Edanur Ergün², Elif Çaylan², Nisanur Dinçer²

¹ School of Communication, Istanbul Medipol University, Istanbul, Turkey

² School of Business, Istanbul Medipol University, Istanbul, Turkey

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ABSTRACT

Marketing technology (MarTech) encompasses digital tools and platforms used to manage, personalize, and scale interactions between businesses and their customers through data analytics, automation, and artificial intelligence-based solutions. In particular, the accessible and real-time nature of embedded finance platforms enables MarTech solutions to reach broad user bases rapidly and influence customer experience. Since optimizing all MarTech capabilities simultaneously is challenging in terms of both cost and feasibility, businesses need to prioritize the allocation of their limited resources to achieve the greatest impact. In this context, the primary objective of this study is to determine the relative importance of MarTech capabilities that enhance customer experience within embedded finance platforms. To achieve this objective, the study applies the Analytic Hierarchy Process (AHP) using both arithmetic and geometric mean aggregation approaches to determine the criteria weights and corresponding priorities. The results indicate that the AHP analysis based on the arithmetic mean produces inconsistent results, whereas the geometric mean approach yields consistent results. The analysis identifies customer analytics capability as the most important MarTech capability for enhancing customer experience in embedded finance platforms, with a total weight vector of 2.46. Personalization ranks second, with a total weight vector of 2.02. By comparing prioritization results obtained using arithmetic and geometric mean approaches, the study also provides insights into the influence of aggregation procedures on the consistency and prioritization of MarTech capabilities.

1. Introduction

Marketing technology (MarTech) is defined as a suite of digital tools and platforms that manage, personalize, and scale the interactions businesses have with their customers through data analytics, automation, and artificial intelligence-based solutions.

By processing fragmented and complex customer data in a more meaningful way, these technologies play a pivotal role in enhancing the customer experience. In particular, the accessible and real-time nature of embedded finance platforms enables MarTech solutions to rapidly reach

* Corresponding author.

E-mail address: pinar.yucel@medipol.edu.tr

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broad audiences and influence how customers engage in financial interactions. Furthermore, MarTech capabilities do more than just deliver products and services to customers; they can also shape customer expectations, preferences, and attitudes toward the platform. MarTech investments that are strategically misaligned or fail to adequately address customer needs can lead to wasted resources and diminished user satisfaction.

Consequently, it is crucial to comprehensively evaluate the impact of MarTech capabilities on the customer experience and the criteria that shape this impact.

Numerous criteria play a decisive role in shaping the customer experience on embedded finance platforms. Foremost among these are customer analytics capabilities and personalization. Customer analytics capability is defined as a technology-driven, model-supported approach aimed at improving marketing decision-making processes by leveraging customer and market data [1]. Personalization, meanwhile, employs algorithmic adaptation to deliver content tailored to consumer preferences [2]. Additionally, real-time interaction management, marketing automation capabilities, chatbots and virtual assistants, gamification, and digital wallet integration are key MarTech competencies that enhance the customer experience on embedded finance platforms. Real-time interaction management ensures immediate responses to customer needs and expectations, thereby maintaining a seamless experience—particularly given the speed and continuity required for financial transactions. Marketing automation capabilities boost operational efficiency through process automation and enable the delivery of the right message at the right time. Chatbots and virtual assistants ensure continuous interaction by providing uninterrupted support for user inquiries. Finally, digital wallet integration enhances the user experience by enabling the seamless execution of payments and financial transactions within a single platform.

It is of great importance to correctly evaluate the MarTech elements that contribute the most to companies' customer experiences. Optimizing all metrics simultaneously is very costly and can lead to ineffective allocation of resources. For example, highlighting criteria that do not align with a company's corporate marketing strategy can negatively affect return on investment and overall marketing performance. Although the importance of MarTech for companies is widely accepted in the literature, a holistic priority analysis is needed to reveal which criteria are more decisive compared to others. However, studies in the literature that prioritize these criteria together are very limited. The lack of a consensus regarding the priority order among the criteria creates uncertainty about which criteria companies should focus on in the process of determining marketing technologies. Therefore, new studies are needed to determine the relative importance levels of MarTech competencies that improve customer control in embedded finance platforms in a holistic framework.

The aim of this study is to prioritize the MarTech elements that contribute most significantly to the customer experience on embedded finance platforms. In this context, a list of criteria is established through a literature review, and a set of questions is formulated based on these criteria. The study is primarily motivated by the lack of consensus in the literature regarding which MarTech elements contribute most to the customer experience on embedded finance platforms. Furthermore, since investing in all these capabilities simultaneously is challenging in terms of both cost and feasibility, prioritization is required to enable businesses to direct their limited resources toward the areas that yield the greatest contribution. Therefore, the Analytic Hierarchy Process (AHP) method was employed to calculate the relative importance weights of the criteria. This method is used to conduct a priority analysis among the criteria. Within this scope, the study seeks to answer the following research questions: (1) Which criteria are most significant when evaluating the MarTech capabilities that enhance customer experience on embedded finance platforms? (2) What are the relative importance levels and priority rankings of these criteria from the perspective of firms?

This study aims to make significant theoretical and methodological contributions to the MarTech literature. Existing studies on customer experience within embedded finance platforms typically examine criteria—such as customer analytics capabilities, personalization, real-time interaction management, marketing automation proficiency, chatbots and virtual assistants, digital wallet integration, and gamification—in isolation from one another. In contrast, this research adopts a holistic perspective to address the MarTech elements that most significantly contribute to customer experience on embedded finance platforms, prioritizing their relative importance using the Analytic Hierarchy Process (AHP) method. In this regard, the study seeks to fill a significant gap in the literature by revealing not only which criteria are effective but also the level of importance businesses assign to these capabilities. Secondly, the study presents a comprehensive decision-making framework by evaluating—within a single model—key capabilities highlighted in recent research, such as customer analytics, personalization, real-time interaction management, automation proficiency, chatbots and virtual assistants, gamification, and digital wallet integration. While the literature often examines these elements individually or alongside a limited number of variables, this research addresses them through a multi-criteria decision-making approach, enabling a more holistic assessment. The findings offer both methodological and practical contributions that can guide financial institutions, brands, and platform providers in developing more effective customer experience and marketing strategies.

This study consists of six chapters. After the introduction section, the second section examines the literature on finance, customer experience and MarTech criteria discussed within the scope of the research and creates the theoretical basis of the research. In the third section, the method of the research is explained; Analytical Hierarchy Process (AHP), research model, data collection process and analysis stages are presented in detail. In the fourth section, the findings and the priority ranking of the criteria are reported. In the fifth chapter, the findings are discussed within the framework of the relevant literature and implications for practice are included. In the last section, the results of the research, its limitations and suggestions for future studies are presented.

2. Literature Review

One of the most critical MarTech capabilities influencing customer experience on embedded finance platforms is customer analytics capability. Customer analytics is the process of systematically examining customer data, enabling firms to acquire market-based insights, improve customer relationship management and interaction processes, enhance product or service quality, and support decisions regarding new product strategies [3]. Kanellos *et al.*, [4] define customer analytics as a cornerstone of modern marketing and business strategy. Meanwhile, Hossain *et al.*, [5] emphasize the importance of a sustainable customer analytics capability within a firm's operations. In their study, Singh and Gebauer [6] highlight that customer analytics and data structuring are crucial prerequisites for effective data monetization. Another significant criterion affecting customer experience on embedded finance platforms is personalization. Personalization is the act of designing and producing offerings that align with customer preferences [7]. In other words, personalization leverages behavioral insights to deliver real-time, algorithmically tailored experiences [8]. Sachdeva *et al.*, [9] note that personalization—facilitated through omnichannel strategies and recommendation systems—leads to AI-driven interactions and higher levels of user satisfaction, loyalty, and sustainable growth. Rosário and Dias [10], on the other hand, emphasize that personalization increases satisfaction and loyalty by making customers feel valued and understood.

Another significant criterion influencing customer experience on embedded finance platforms is real-time marketing management. A firm-centric perspective is adopted to examine real-time marketing messages and investigate their impact on consumer engagement [11]. In their study, Fuchs [12] noted that real-time interaction and automation play a central role in reaching customers with

relevant messages at the right time. Meanwhile, Debnath *et al.*, [13] emphasized that real-time marketing campaigns are significantly influenced by external factors such as consumer expectations, social media trends, and digital advertising technology. In this context, another key criterion affecting customer experience is gamification. Gamification involves the use of game design elements and mechanics in non-game environments. In an educational context, it aims to enhance students' motivation, engagement, and self-efficacy by making the learning process more interactive and enjoyable [14]. Gamification is a concept that supports important marketing outcomes such as repurchase, customer retention, and customer engagement [15]. In this regard, gamification is viewed not merely as a practice that yields behavioral and marketing results, but also as a technological marketing tool that supports the digital customer experience. Saha *et al.*, [16] stated that gamification is a crucial technological element that enhances customer interaction, user motivation, and customer experience on digital platforms. Malik *et al.*, [17] stated that, based on their research, gamification enhances customer-brand interaction, supports the continuous use of services, and contributes positively to marketing performance outcomes such as brand equity.

Another key criterion influencing the customer experience on embedded finance platforms is marketing automation capability. Marketing automation capability refers to the capacity of businesses to automate marketing activities—such as email marketing, social media, advertising campaigns, lead management, marketing analytics, and customer relations—through software and digital technologies [18]. This entails executing repetitive marketing tasks via predefined rules and workflows; furthermore, with advancements in artificial intelligence, marketing automation is evolving toward more autonomous and adaptive systems [19]. This evolution enables marketing automation to transcend its role as a mere tool for streamlining operational processes, transforming instead into a strategic capability that facilitates the effective use of customer data and the development of more personalized marketing practices. Badie *et al.*, [20] noted that marketing automation supports businesses in communicating with their target audiences in a more personalized, contextual, and focused manner, while also contributing to the analysis of data regarding customer preferences and behaviors. Hokmabadi *et al.*, [21] stated that AI-driven automation supports customer segmentation, personalized communication, and the prediction of customer behaviors within marketing and CRM processes. These findings demonstrate that marketing automation capability contributes to the management of customer relationships in a more effective and scalable way.

Another factor enhancing the customer experience on embedded finance platforms is the use of chatbots and virtual assistants. Beyond providing customers with 24/7 uninterrupted support and instant interaction regarding in-platform financial services, chatbots and virtual assistants can directly influence users' perceptions of the platform's service quality and reliability [22]. According to Park *et al.*, [23], the personalization levels and anthropomorphic (human-like) qualities of chatbots positively impact the customer experience by boosting user satisfaction during financial transactions. Li *et al.*, [24] note that while the cognitive and functional conveniences offered by AI-powered chatbots strengthen customer loyalty, deficiencies in interaction quality can negate the positive effects these systems provide. Meanwhile, Shahzad *et al.*, [25] emphasize in their research that higher chatbot service quality is directly linked to e-brand loyalty and trust; however, they highlight that technical competence alone is insufficient and that the process must be supported by user experience and trust mechanisms.

Another factor that improves customer experience on embedded finance platforms is digital wallet integration. In addition to enabling consumers to complete their financial transactions quickly and securely directly on the merchant platform, digital wallet integration affects the overall satisfaction of the platform by increasing the service quality and payment comfort offered to users

[26]. Rosli *et al.*, [27] revealed that the perceived ease of use of digital wallets positively affects users' attitudes towards this technology and that this attitude is an important determinant of intention to use. According to Amoroso and Ackaradejruangsri [28], the balance between the transactional benefits obtained by consumers in the use of e-wallets and the usage costs they perceive shapes users' intentions to constantly prefer these technologies. Al-Hattami *et al.*, [29], in line with his study, states that the perception of trust is a critical regulator in the formation of customer loyalty towards mobile wallet use and that reducing security concerns is the basis for the success of these systems. Bhattacharya and Bera [30] show that meeting expectations, satisfaction and system quality are decisive in consumers' preference for a particular digital wallet brand in the post-adoption stage.

3. Methodology

In this study, Analytical Hierarchy Process (AHP), one of the Multi-Criteria Decision Making (MCDM) methods, was used to determine the importance levels and prioritize MarTech competencies that improve customer experience in embedded finance platforms. MCDM methods are approaches that allow multiple quantitative and qualitative criteria to be evaluated together in the decision process. In these methods, the importance of the criteria in terms of the decision problem is expressed with certain weights and the alternatives are evaluated in line with these weights. In the MCDM literature, various methods such as SWARA, COPRAS, DEMATEL, GRA, TOPSIS, VIKOR, AHP, ANP, ELECTRE and MABAC have been developed for different decision problems [31]. Among these methods, AHP is one of the widely used MCDM approaches because it allows the relative importance of criteria to be determined through pairwise comparisons.

The AHP method was employed, taking into account that the relative importance of the MarTech capabilities addressed in the study regarding customer experience may vary and that the decision-making process requires the simultaneous evaluation of multiple criteria. AHP enables the assessment of criteria through pairwise comparisons, the calculation of relative importance weights, and the ranking of criteria based on their levels of importance. Accordingly, the MarTech capabilities identified in the study were structured hierarchically and prioritized based on expert evaluations.

AHP is a systematic approach that enables the simultaneous evaluation of multiple criteria within the decision-making process. In the method developed by Saaty [32], the decision problem is first decomposed into a hierarchical structure, and criteria are subsequently compared in pairs based on expert opinions. Priority weights for each criterion are derived from these comparisons. Additionally, the Consistency Ratio (CR) is calculated to assess the consistency of expert judgments, with a value below 0.10 considered an acceptable level of consistency.

According to Saaty, AHP consists of two fundamental stages: transforming the decision problem into a hierarchical structure based on criteria, and determining the relative weights of the criteria. Once the hierarchical structure is established, the criteria are compared pairwise, and their relative importance weights are calculated using the decision matrix derived from expert evaluations [33].

AHP consists of certain steps and these steps are as follows [34].

Step 1. Establishing the Hierarchical Structure: Decision problem; It is transformed into a hierarchical structure based on the goal, criteria and sub-criteria, if any. In determining the criteria, the opinions of experts with knowledge and experience on the subject are used.

Step 2. Construction of Pairwise Comparison Matrices: The determined criteria are compared in pairs using Saaty's evaluation scale, and a comparison matrix is constructed. The scales used in the analysis are denoted in Table 1.

Step 3. Calculation of Criterion Weights: The relative importance weight of each criterion is calculated by normalizing the pairwise comparison matrix, and priority values are obtained.

Step 4. Consistency Analysis: The Consistency Ratio (CR) is calculated to verify the reliability of the expert assessments. A CR value of 0.10 or lower indicates that the comparisons are consistent at an acceptable level.

Table 1
Saaty Evaluation Scale

Key Values	Value Definitions
1	Equally important, probable, or preferred
3	Moderately more important, probable, or preferred
5	Much more important, probable, or preferred
7	Significantly more important, probable, or preferred
9	Far more important, probable, or preferred
2, 4, 6, 8	Intermediate values reflecting a compromise

4. Analysis Results

This study aims to determine the importance levels of MarTech competencies that influence the enhancement of customer experience on embedded finance platforms and to establish a priority ranking for them. To this end, the Analytic Hierarchy Process (AHP)—a Multi-Criteria Decision-Making (MCDM) method—was employed. In the initial stage of the study, the expert opinions of three academics conducting research in the fields of embedded finance, financial technologies, digital marketing, customer experience, and MarTech were sought. The criteria evaluated within the scope of the analysis are presented in Table 2.

Table 2
Criteria List

Criteria List	Literature
Customer Analytics Capability (C1)	Ozdemir <i>et al.</i> , [3]
Personalization (C2)	Chandra <i>et al.</i> , [7]
Real-Time Interaction Management (C3)	Chae <i>et al.</i> , [11]
Marketing Automation Competency (C4)	Silva <i>et al.</i> , [18]
Chatbots And Virtual Assistants (C5)	Chen <i>et al.</i> , [22]
Gamification (C6)	Farace <i>et al.</i> , [15]
Digital Wallet Integration (C7)	Ajina <i>et al.</i> , [26]

Table 2 presents the seven key criteria evaluated within the scope of the analysis and the literature sources used to determine them. In the next stage, the relative importance weights of the criteria will be determined using the AHP method. The analysis results will be obtained through two distinct calculation approaches—arithmetic mean and geometric mean—and evaluated comparatively.

4.1. Evaluation Using the AHP Arithmetic Mean

A pairwise comparison matrix was created based on the expert opinions of three academicians regarding the criteria. This matrix was prepared by taking the arithmetic average of the evaluations obtained from academicians. The data obtained as a result of these calculations are shown in Table 3.

According to Table 4, "Customer Analytics Capability" has been identified as the most important MarTech competency for enhancing the customer experience on embedded finance platforms. In the subsequent stage of the analysis, the maximum eigenvalue ($\lambda_{\max}$) must be calculated to assess the consistency of the expert evaluations. First, the weighted sum vector was obtained. The results are denoted in Table 6.

Table 3
Comparison Matrix for Criteria

	C1	C2	C3	C4	C5	C6	C7
C1	1,00	2,83	3,33	3,67	4,33	6,00	5,33
C2	0,84	1,00	2,67	4,00	4,67	6,67	5,67
C3	0,33	0,39	1,00	2,67	3,00	5,33	4,67
C4	0,28	0,30	0,42	1,00	1,75	4,33	4,67
C5	0,24	0,22	0,33	1,61	1,00	4,00	3,67
C6	0,17	0,15	0,19	0,23	0,31	1,00	2,06
C7	0,21	0,21	0,24	0,22	0,32	2,25	1,00

Table 4 presents the normalized version of the comparison matrix.

Table 4
Normalized Matrix

	C1	C2	C3	C4	C5	C6	C7
C1	0,324574961	0,5542474	0,407450524	0,273631841	0,2818937	0,202816901	0,197125257
C2	0,274085523	0,1956167	0,325960419	0,298507463	0,3035779	0,225352113	0,209445585
C3	0,108191654	0,0760732	0,122235157	0,199004975	0,1951572	0,18028169	0,1724846
C4	0,090159711	0,058685	0,050931315	0,074626866	0,1138417	0,146478873	0,1724846
C5	0,079340546	0,0434704	0,040745052	0,120232172	0,0650524	0,135211268	0,135523614
C6	0,054095827	0,0298859	0,023088863	0,017412935	0,0198771	0,033802817	0,075975359
C7	0,069551777	0,0420214	0,029588669	0,016583748	0,0205999	0,076056338	0,036960986

The calculated criterion weights are presented in Table 5.

Table 5
Weights (w) and Weight Sum Vector

	Weights (w)	Total Weight Vector (A*w)
C1	0,320248664	2,757438986
C2	0,261792246	2,228601841
C3	0,15048978	1,281863822
C4	0,101029727	0,837689206
C5	0,088510777	0,735744015
C6	0,036305545	0,294279693
C7	0,04162326	0,335079848

Table 6

Lambda (λ_{max})
Lambda (λ_{max})
8,343007283

The maximum eigenvalue is calculated by dividing each element in the weighted sum vector obtained by multiplying the pairwise comparison matrix and the criterion weights vector by the relevant criterion weight and taking the arithmetic average of the obtained ratios. This obtained value is used to determine the Consistency Index (CI) and Consistency Ratio (CR). CI and CR values obtained as a result of the calculations are presented in Table 7.

Table 7
Consistency Index (CI) and Consistency Ratio (CR)

CI	CR
0,223835	0,1695716

The consistency ratio (CR) is calculated by dividing the consistency index (CI) by the random consistency index (RI). Since there are a total of seven criteria in this study, the value of 1.32—specified for $n=7$ in Saaty's Random Consistency Index table—was used. The calculation yielded a consistency ratio of 0.1695716. As the obtained value exceeds the acceptance threshold of 0.10, it was concluded that the expert evaluations were inconsistent.

4.2. Evaluation Using the AHP Geometric Mean

At this stage, a pairwise comparison matrix regarding the criteria was constructed based on the evaluations of three academics, and the geometric mean method was employed to aggregate expert opinions. The aggregated pairwise comparison matrix obtained through the geometric mean is presented in Table 8.

Table 8
Comparison Matrix for Criteria

	C1	C2	C3	C4	C5	C6	C7
C1	1,00	1,96	3,17	3,63	4,22	6,00	5,01
C2	0,51	1,00	2,62	3,68	4,58	6,60	5,13
C3	0,31	0,38	1,00	2,52	3,00	5,31	4,38
C4	0,28	0,27	0,40	1,00	1,14	4,31	4,58
C5	0,24	0,22	0,33	0,87	1,00	3,63	3,42
C6	0,17	0,15	0,19	0,23	0,28	1,00	1,10
C7	0,20	0,19	0,23	0,22	0,29	0,91	1,00

Subsequently, the data for the normalized matrix are presented in Table 9.

Table 9
Normalized Matrix

	C1	C2	C3	C4	C5	C6	C7
C1	0,369784713	0,4688236	0,399734856	0,298815199	0,2906725	0,216069692	0,203608886
C2	0,188913009	0,2395093	0,329973853	0,302909066	0,3156027	0,237815468	0,208345665
C3	0,116474886	0,0913899	0,12590859	0,207186887	0,2067782	0,191340258	0,177868745
C4	0,101750185	0,0650128	0,049966857	0,082222171	0,0789007	0,155169347	0,185964604
C5	0,087685651	0,0523077	0,04196953	0,071827682	0,0689261	0,130874896	0,13889711
C6	0,061630786	0,0362681	0,023696904	0,019082075	0,0189657	0,036011615	0,044701228
C7	0,073760769	0,0466886	0,02874941	0,01795692	0,0201541	0,032718724	0,040613761

Within the scope of the normalization process, first the column totals of the combined pairwise comparison matrix were calculated, and then each matrix element was divided by the total of its column. The sum of the values in each column of the normalized matrix obtained as a result of the process must be equal to 1. The results regarding the criterion weights and the weighted sum vector calculated on the normalized matrix are presented in Table 10.

Table 10
Weights (w) and Weight Sum Vector

	Weights (w)	Weight Sum Vector ($A*w$)
C1	0,32107278	2,46036316
C2	0,260438429	2,026362394
C3	0,159563928	1,218324365
C4	0,102712379	0,740409901
C5	0,084641229	0,612698207
C6	0,034336636	0,245426546
C7	0,037234617	0,266859434

According to Table 10, Customer Analytics Capability was identified as the MarTech competency contributing most significantly to enhancing the customer experience on embedded finance platforms, while Personalization ranked second. To determine the level of consistency among expert evaluations within the scope of the analysis, the maximum eigenvalue, consistency index (CI), and consistency ratio (CR) were calculated, respectively. The findings obtained from these calculations are presented in Table 11.

Table 11
Lambda (max), Consistency Index (CI), and Consistency Ratio (CR)

LAMBDA ($\lambda_{\max}$)	7,40583376
CI	0,06763896
CR	0,051241636

As shown in Table 11, the consistency ratio (CR) was calculated as 0.0512. Since the obtained value is below the acceptable upper limit of 0.10 ($0.0512 < 0.10$), it was concluded that the expert evaluations are consistent. Therefore, it can be stated that the AHP analysis performed possesses an acceptable level of consistency.

5. Discussion

This study examined, using the AHP method, which MarTech competencies take precedence in enhancing the customer experience on embedded finance platforms. The findings identified customer analytics capability as the most critical MarTech competency for improving customer experience. This result demonstrates that accurately analyzing customer behaviors, needs, and interactions on embedded finance platforms plays a fundamental role in shaping financial services—offered to customers—in a more effective and user-centric manner. Indeed, the literature indicates that advanced customer analytics capabilities are vital tools for creating, delivering, and managing customer value, with personalization practices standing out as a key component of this process [35]. In this regard, the study's findings align with existing research that emphasizes the importance of customer analytics in operationalizing a customer-centric marketing approach.

Customer analytics capabilities are followed, in order, by personalization, real-time interaction management, and marketing automation competencies. The fact that personalization ranks second indicates that users of embedded finance expect financial services tailored to their specific needs and transaction contexts—rather than generic solutions—at the moment of purchase or payment. This finding aligns with the results of Lindqvist [36], which demonstrate that personalization in digital banking services fosters customer satisfaction and the intention to remain on the platform. Accordingly, transforming data obtained through customer analytics into customer-specific offers can contribute to enhancing the customer experience on embedded finance platforms.

The fact that real-time interaction management ranks third demonstrates that, regarding financial offers, it is crucial not only to consider the content itself but also to present it at a time that aligns with the customer's needs at the moment of the transaction. Salonen *et al.*, [37] found that content delivered in a timely manner across various stages of the customer journey can enhance customer engagement. Although that study was conducted within the context of B2B social media marketing, the findings reinforce the importance of delivering content and offers at the right time for customer engagement. Similarly, Ramasundaram *et al.*, [38] examined the ability of digital platform ecosystems to adapt to shifting customer preferences through the concept of "fluidity," highlighting the significance of this adaptability for the customer experience. These studies provide related findings that support the high ranking of real-time interaction management in the current research.

Marketing automation, chatbots and virtual assistants were listed as complementary MarTech competencies that support continuity of customer experience and access to service. Marketing automation contributes to the consistent and timely use of information obtained as a result of customer analytics at different contact points. Chatbots and virtual assistants make it easier to respond to customers' questions quickly and access the service at different times of the day. Huang *et al.*, [39] revealed that chatbot-based customer services can provide advantages such as scalability and uninterrupted accessibility. Söderlund and Andersson [40] stated that the communication style of chatbots towards customers can affect customer satisfaction. These results show that not only the technological presence of chatbots and virtual assistants, but also how they provide service to the customer is important in terms of experience.

The inclusion of digital wallet integration in the rankings demonstrates that completing payment and financing transactions easily and seamlessly—without redirecting the user to a different platform—is crucial for the customer experience. Iman *et al.*, [41] noted that ease of use and user-friendly systems in open banking and financial technology services are among the factors that support customer experience and the intention to adopt technology. Accordingly, digital wallet integration can be considered a MarTech capability that reduces the effort customers expend during transactions by incorporating embedded finance services into purchasing and payment processes.

One of the study's notable findings is that gamification competence was identified as the criterion with the lowest weight compared to other MarTech competencies. Literature on digital marketing and financial technology indicates that gamification can enhance user engagement, interaction, and the motivation to use a service. Indeed, Rahman *et al.*, [42] demonstrated that gamification and trust play a role in fostering the adoption and continued use of mobile wallets. However, the fact that gamification ranked last in the current study suggests that experts prioritize functional competencies—such as customer analytics, personalization, precise timing, and seamless transaction experiences—over gamification within embedded finance platforms. Consequently, gamification should be viewed not as an insignificant element of the embedded finance customer experience, but rather as a complementary engagement tool that supports core analytical and technological competencies.

When the general order of the criteria is evaluated together, it can be seen that experts consider customer experience in embedded finance platforms primarily through analyzing customer data, transforming the obtained information into personalized services, presenting offers at the right time and completing payment transactions without interruption. The fact that marketing automation, chatbots, virtual assistants and gamification have lower weights does not mean that these competencies are unimportant. This ranking shows that experts consider these tools as elements that complement core competencies such as customer analytics and personalization and support their reflection on the customer experience.

In the study, varying levels of consistency were achieved by aggregating expert opinions using arithmetic and geometric mean methods. While the consistency ratio of the decision matrix constructed using the arithmetic mean exceeded the acceptable limit, the matrix constructed using the geometric mean was found to be consistent at an acceptable level. This discrepancy demonstrates that the aggregation method employed in group AHP applications can influence the structure of the consensus decision matrix and the consistency of the resulting outcomes. However, it cannot be concluded that the high consistency ratio obtained via the arithmetic mean resulted solely from the averaging method used; differences among expert opinions and the manner in which the arithmetic mean matrix was constructed may also have influenced the CR value. Therefore, the value obtained in the study should not be interpreted to mean that the arithmetic mean will invariably yield inconsistent results in all AHP applications; rather, it indicates that, for the specific

dataset in question, the consensus matrix constructed using the arithmetic mean failed to meet the threshold for acceptable consistency.

The preference for the geometric mean is not based solely on the ability to derive a CR value using this method. Instead of aggregating criterion weights calculated individually for each expert, the study aimed to construct a consensus decision matrix from pairwise comparison judgments; the AIJ approach was employed for this purpose. The geometric mean was adopted for the final calculations because it preserves the reciprocity relationship inherent in pairwise comparisons and ensures an acceptable level of consistency in the current study. Results derived from the arithmetic mean were presented for comparative purposes to assess how different aggregation methods might affect the consistency of the decision matrix. Consequently, the final weights and importance rankings of the criteria were determined based on the consensus decision matrix constructed using the geometric mean.

6. Conclusion

In this study, the importance levels of marketing technology (MarTech) capabilities that contribute to enhancing customer experience on embedded finance platforms were determined using the AHP method. Analyses based on expert opinions revealed that data-driven and customer-centric MarTech capabilities play a prominent role in improving customer experience within the embedded finance ecosystem. This indicates that within the embedded finance structure—where financial services are integrated into various digital platforms—the mere existence of a technological infrastructure is insufficient; interpreting customer data, creating personalized experiences, and engaging with customers at the right time are also crucial.

In the study, expert opinions were evaluated using both arithmetic mean and geometric mean methods. The analyses revealed that the decision matrix constructed using the arithmetic mean exceeded the acceptable limit for the consistency ratio ($CR=0.16$), whereas the decision matrix constructed using the geometric mean fell within the acceptable consistency range ($CR=0.05$). Although customer analytics capability emerged as a key criterion in both approaches, the geometric mean method was found to yield a more consistent group assessment of the experts' pairwise comparisons. Consequently, the study's final evaluations were based on the results obtained via the geometric mean method.

Based on geometric mean results, customer analytics capability has been identified as the most significant MarTech competency for enhancing the customer experience on embedded finance platforms. Customer analytics capability is followed, in order, by personalization, real-time interaction management, marketing automation capability, chatbots and virtual assistants, digital wallet integration, and gamification. The fact that customer analytics capability ranks first indicates that improving the customer experience on embedded finance platforms primarily depends on the accurate analysis of data derived from customer behaviors, needs, and interactions. The second-place ranking of personalization highlights the importance of translating obtained customer insights into products, services, offers, and experiences tailored to the individual. Finally, the third-place ranking of real-time interaction management demonstrates that responding to customer needs at the right time is a key component of the embedded finance experience.

However, the fact that chatbots, virtual assistants, digital wallet integration, and—in particular—gamification hold a lower priority does not imply that these capabilities are insignificant for the customer experience. The findings indicate that these elements have a lower relative priority compared to core capabilities such as customer analytics, personalization, and real-time interaction management. The fact that gamification ranks last, in particular, suggests that—within the context of embedded finance—prioritizing capabilities based on data analytics, personalization, and

interaction management is essential before focusing on entertainment- and engagement-oriented applications to enhance the customer experience. Similarly, the lower ranking of digital wallet integration implies that, while technical integration and ease of transaction are important, they are not the sole deciding factors in MarTech investments aimed at improving the customer experience.

One of the study's significant contributions is that it offers businesses a systematic decision-making framework for enhancing customer experience on embedded finance platforms by prioritizing MarTech capabilities according to their relative importance. Through the AHP method, the study identifies not only which MarTech capabilities are important but also their priorities relative to one another. In this regard, while approaching the relationship between embedded finance and marketing technologies from a decision-making perspective, the study also provides practical insights for businesses regarding which capabilities should be prioritized when allocating limited technology and marketing resources. Based on the findings, it is recommended that embedded finance platforms seeking to improve customer experience prioritize developing robust customer analytics infrastructures, transforming the data obtained into personalized experiences, and investing in technological capabilities that enable real-time customer interaction.

The research has some limitations. First of all, the relatively limited number of studies that examine embedded finance and MarTech competencies together in the context of customer experience creates a significant limitation in establishing the conceptual framework of the research. In addition, the fact that the research was conducted based on expert opinions and included the evaluations of a limited number of experts limits the generalizability of the findings. It should also be noted that the findings were obtained from expert evaluations and not directly from consumers or businesses using embedded finance platforms. Additionally, the study is limited to seven MarTech competencies and the AHP method. The fact that new MarTech applications may emerge in the embedded finance ecosystem in line with technological developments may require the criteria set to be expanded over time.

Future research could benefit from incorporating the assessments of broader and more diverse groups of experts, as well as the views of consumers who directly use embedded finance services. Furthermore, the robustness of findings could be tested using various multi-criteria decision-making methods—such as Fuzzy AHP, DEMATEL, ANP, TOPSIS, or BWM—allowing for a more comprehensive examination of the interrelationships among MarTech capabilities. In particular, investigating potential causal links between customer analytics, personalization, and real-time interaction management could constitute a significant area for future study. Additionally, comparative studies across different sectors, types of embedded finance applications, and countries could help determine whether the importance of MarTech capabilities varies according to context. This would facilitate the creation of a more comprehensive framework regarding the conditions and priorities under which MarTech investments should be implemented to enhance the customer experience within the embedded finance ecosystem.

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Conflicts of Interest

The authors declare no conflicts of interest.

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