The American Journal of Management and Economics Innovations
ISSN 2693-0811 | Open Access

TYPE Original Research
PAGE NO. 74-79
DOI 10.37547/tajmei/Volume07Issue04-09

Check for updates

Utilization of Geolocation Data for Personalizing Financial Services

Pavlov Artem
Authorized Member (AMBR) at Global Expert of Development LLC
Hollywood, Florida, USA

OPEN ACCESS
SUBMITED 24 February 2025
ACCEPTED 28 March 2025
PUBLISHED 25 April 2025
VOLUME Vol.07 Issue04 2025

CITATION

Pavlov Artem. (2025). Utilization of Geolocation Data for Personalizing Financial Services. The American Journal of Management and Economics Innovations, 7(04), 74–79. https://doi.org/10.37547/tajmei/Volume07Issue04-09

Abstract: This article examines the essence and specific features of applying geolocation data for personalizing financial services. In the context of the rapid digitalization of this sector (as well as others), the use of such data is becoming strategically significant both today and in the future. Banks and financial institutions are actively integrating spatial analytics into their services to enhance service quality and personalize offerings. However, along with the beneficial effects, several critical challenges and contradictions arise, including the interpretation of geodata, privacy concerns, and the efficiency of processing algorithms. The objective of this study is to analyze the ways geolocation data is utilized to personalize financial services, identify key advantages, highlight problematic areas, and outline future directions for its application. The article reviews the primary technological approaches and emphasizes that despite the evident benefits, large-scale implementation of geolocation technologies requires careful consideration of personal data protection and transparency of algorithms. The author's contribution lies in the comprehensive examination of the issue, presenting a classification of geolocation applications and identifying gaps in the academic literature. The findings will be valuable for financial institutions, fintech solution developers, digital marketing specialists, and analysts working with spatial data.

Keywords: Banking technologies, geolocation data, geomarketing, personal data protection, machine learning, financial service personalization, fraud prevention, digital transformation.

Introduction:

Modern financial institutions actively employ digital technologies to enhance customer service quality. To attract more clients, marketers in the financial services sector optimize SEO and digital advertising, while personalizing customer interactions to increase call conversion rates.

One of the most promising directions in this field is the application of geolocation data for personalizing financial services. However, integrating spatial data into relevant algorithms presents several methodological and ethical challenges. Key concerns include the accuracy of location interpretation, data privacy compliance, and the effectiveness of machine learning models utilizing this information.

According to statistical data, 90% of loan consumers (including mortgage borrowers), 85% of individuals cashing checks, and 76% of respondents filing tax returns begin their journey with an online search [10]. For many, this step serves as the initial phase in evaluating available options, highlighting the significance of mobile queries and geolocation in customer acquisition.

Given these considerations, contemporary researchers focus on examining the key aspects of geolocation data utilization in the financial sector, analyzing its impact on service personalization, and addressing potential risks associated with its implementation.

MATERIALS AND METHODS

An analysis of scientific publications and industry reports on the subject reveals that researchers approach the problem from various perspectives, including the adaptation of financial institutions to the digital environment, the use of geomarketing, the assessment of service accessibility, and the integration of geolocation technologies into marketing strategies.

In the study by M. Fundira, E.I. Edoun, and A. Pradhan [3], existing models of digital transformation in the financial sector are analyzed, evaluating their potential for personalization. The authors emphasize that the use of geolocation data plays a key role in improving customer interaction and creating new touchpoints with users.

E. Nematli [9] examines the role of electronic banking in the development of the modern financial system. The study notes that the digitalization of services inevitably leads to the integration of geolocation systems into service mechanisms, including targeted offers and enhanced user experience.

A separate study by S. Maity and T.N. Sahu [8] explores the impact of branch accessibility on financial inclusion. The researchers highlight that geolocation data analysis is applied to optimize branch locations and improve accessibility, particularly in regions with low population density.

Several sources focus on the application of geomarketing in financial services. T. Crisóstomo-Berrocal, F. Sierra-Liñan, and C. Carbonell-Michael [2] describe digital platforms based on geomarketing and their influence on small and medium-sized enterprises.

A similar topic is addressed by A. Madleňák [7], who analyzes location-based marketing communication in a global context. The article presents examples of how financial organizations leverage spatial data for personalized advertising and targeted offers.

Industry reports provide statistical summaries and market forecasts on geomarketing development [4], indicating that financial institutions are actively investing in geolocation analytics technologies to enhance the accuracy of strategic decisions.

A separate area of literature is dedicated to security concerns. D. Komosny [5] examines the method of retrospective geolocation of IP addresses and its application in geographically adapted internet services. This approach is particularly relevant for fintech companies engaged in cybersecurity and fraud prevention.

The study by C.D. Au, Ph. Krahnhof, and L. Klingenberger [1] focuses on analyzing the needs of financial institution clients. The research demonstrates that modern users expect a personalized approach, including services based on their geographic location.

Additionally, industry reports provide up-to-date summaries on the impact of geolocation strategies on marketing campaigns [6, 10], presenting statistical data on the effectiveness of personalized offers.

A review of literature and contemporary materials highlights that the use of geolocation data in financial services is considered from multiple perspectives. However, certain shortcomings persist, including varying approaches to data interpretation, ethical concerns that remain superficially addressed, and a lack of detailed descriptions of data analysis algorithms. Most studies focus only on general principles of geolocation usage, while specific machine learning methods are rarely described in detail.

For this study, the following methods were used: comparison, statistical data processing, systematization, and generalization.

RESULTS AND DISCUSSION

Geomarketing is a field that utilizes user location data to structure marketing initiatives, employing digital mapping tools to organize and visualize data for evaluation and decision-making [2, 7]. In recent years, this market has been growing rapidly, as illustrated in Figure 1, which includes projected values

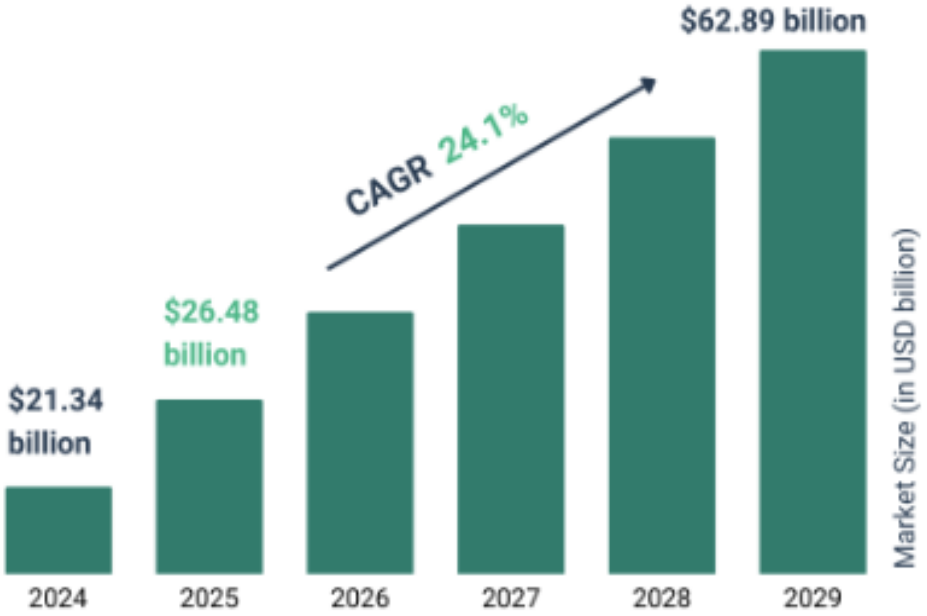

Fig. 1. Dynamics of the geomarketing market volume (with forecast) [4]

According to 67% of marketers, the most significant advantage of leveraging location-based services to enhance efficiency and service quality is targeted marketing [6]. This enables narrowing the audience to users with a relatively high likelihood of brand loyalty.

Geolocation data refers to information about a user's location obtained through GPS, Wi-Fi, cell towers, or Bluetooth technology. Its application in the financial sector is carried out through several key mechanisms (Figure 2).

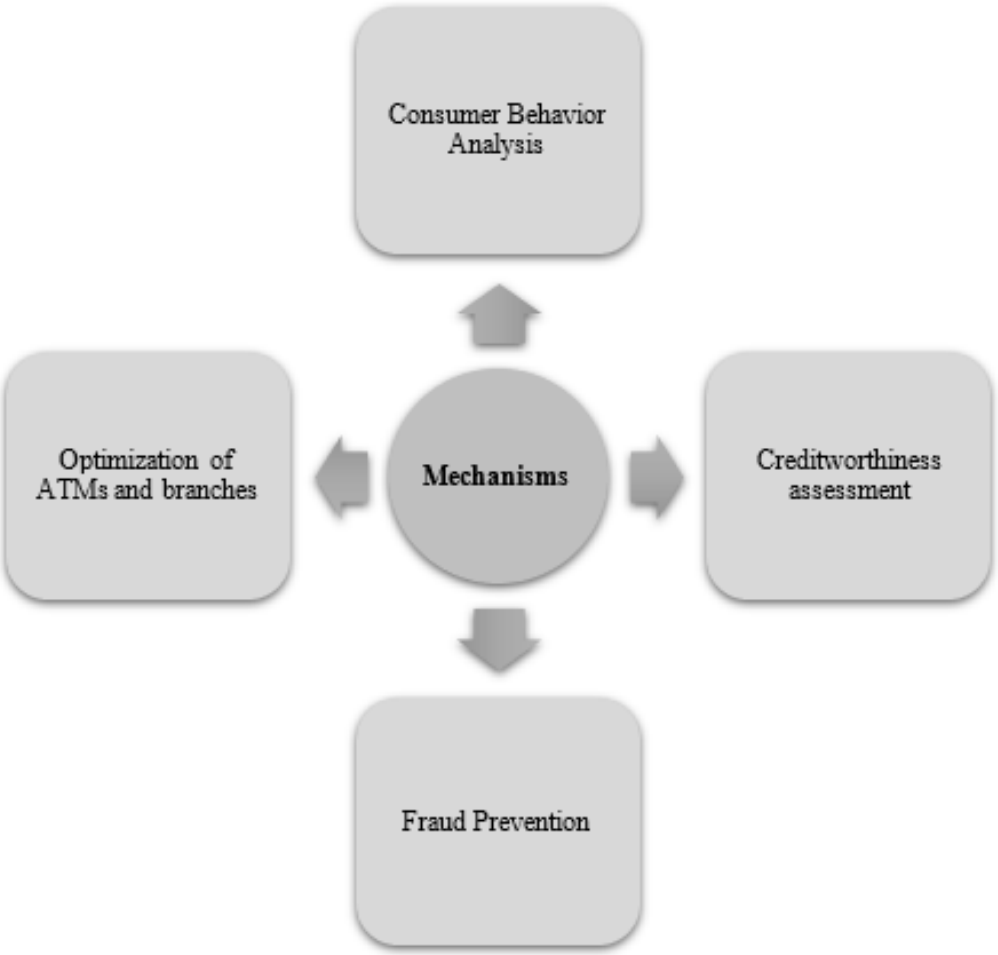

Fig. 2. Areas of application of geolocation data in the financial sector (compiled by the author based on [1-3, 5-9])

Financial institutions can identify patterns in customer movements, allowing them to create personalized offers. For instance, if an individual frequently visits shopping malls, a bank may offer a credit card with increased cashback for retail purchases.

The analysis of movement routes helps assess a borrower's solvency. Regular trips to business districts or visits to high-end establishments serve as indirect indicators of a high income level.

Geolocation data facilitates the identification of suspicious transactions. If a card is used in two different countries within a short time frame, the security system blocks the transaction and prompts an identity verification request.

The analysis of customer movements enables banks to make informed decisions about ATM and branch placement in areas with high user activity. Let's consider two hypothetical examples:

1. A bank analyzes customer movements in downtown New York using data from mobile applications and transactions. Over the course of a month, 10,000 consumers conduct transactions in the Times Square area. On average, each customer visits the area 15 times per month. The data shows that 40% of customers use ATMs, while 60% visit bank branches. The average number of cash withdrawals per customer is two per month, with an average withdrawal amount of $100. This means that ATMs in the area process 8,000 transactions per month, totaling $800,000. The bank decides to install two additional ATMs, expecting to increase customer flow by 20% and reduce the burden on existing branches.

2. The owner of a small regional bank analyzes customer movements in the suburbs of Dallas. Within a 5-mile radius of an existing branch, there are 50,000 residents, 5,000 of whom are active bank customers. Mobile data analysis reveals that 3,000 consumers pass through a major shopping center daily, but there are no ATMs in that location. On average, a customer uses an ATM three times per month, with an average withdrawal of $80. If an ATM is installed in the shopping center, an estimated 9,000 transactions per month could be expected, totaling $720,000. The bank decides to install the ATM, anticipating a 10% increase in the

number of customers due to the convenience of the new location.

The use of spatial data unlocks new opportunities for service personalization. Figure 3 summarizes the key benefits.

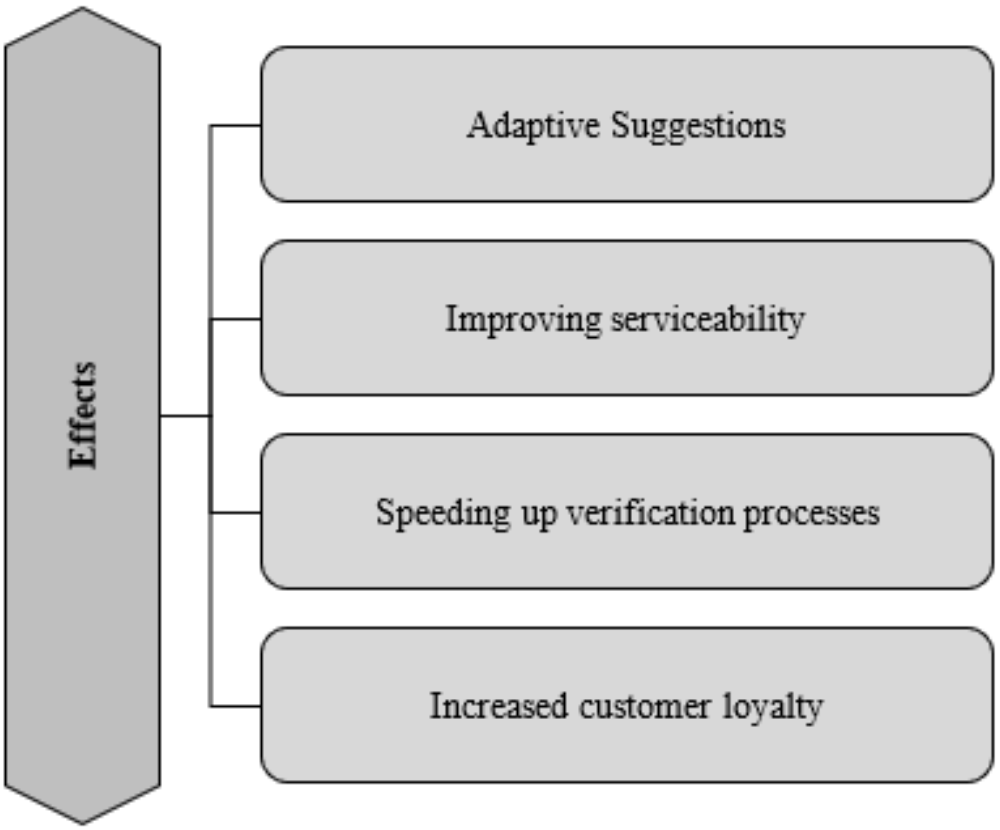

Fig. 3. Highlighting the advantages of using geolocation data to personalize financial services (compiled by the author on the basis of [2, 5, 7-9])

Commenting on the presented scheme, it is important to highlight the following aspects. A financial institution can provide customers with special offers based on their location. For instance, if a user is near a car dealership, they may receive an offer for an auto loan on favorable terms. Additionally, recommendations can include nearby bank branches, currency exchange offices, and insurance products relevant to the user's current location. Let's consider a hypothetical example. A bank in Los Angeles utilizes geolocation data for personalized offers. Over the course of a month, 50,000 customers are detected within a 500-meter radius of car dealerships, with 5% of them (2,500 people) having previously expressed interest in auto loans via the mobile app or website. The bank sends these consumers personalized offers with a reduced interest rate. Assuming that 10% of recipients (250 people) respond and take out an auto loan with an average amount of $30,000 for a five-year term at an annual interest rate of 5%, we can calculate the bank's profit. With annuity payments, the monthly payment per loan is approximately $566. The total amount paid over five years is $33,960 per customer, generating a profit of $3,960 per loan. For 250 customers, the total profit amounts to $990,000 over the full loan term. Thus, leveraging geolocation data allows the bank to increase the volume of issued loans and generate additional revenue while enhancing customer convenience.

In mobile banking, identity verification is partially based on geolocation data, reducing the need for additional checks.

Finally, personalized offers create a sense of individual approach among customers, enhancing satisfaction and brand loyalty. These factors are crucial for strengthening customer retention.

Despite its clear advantages, the use of geolocation data presents several challenges, including:

- Privacy concerns;
- Protection of personal information;
- Errors in data interpretation;
- Risks of data misuse;
- Ethical issues.

The collection and processing of spatial data streams

require strict compliance with data protection regulations. Breaches can lead to severe consequences, including financial losses for customers.

The mere presence of a user in a specific location is insufficient for making accurate conclusions. For example, visiting an expensive restaurant does not necessarily indicate high solvency, as the individual may simply be accompanying a friend.

Some unethical companies exploit geolocation data for manipulative purposes, such as restricting access to certain financial services based on location.

Finally, excessive intrusion into customers' personal space can provoke a negative reaction. Maintaining a balance between personalization and privacy requires careful regulation.

CONCLUSION

The use of geolocation data in the financial sector provides extensive opportunities for service personalization, enhanced convenience, and improved security. However, the implementation of such technologies requires a well-thought-out approach that carefully considers both technological and ethical aspects.

As artificial intelligence continues to advance and data processing techniques evolve, the applications of geolocation in financial services are expected to expand further. In the future, hybrid analytical models will likely develop. The combination of geolocation data with other sources—such as social media activity, transaction history, and mobile app preferences—will enhance the accuracy of personalization.

Additionally, privacy protection mechanisms will improve. New anonymization techniques will be introduced to safeguard user data without compromising service quality. Finally, financial decision-making processes will become more automated. AI will not only offer users discounts and bonuses but also provide comprehensive financial strategies tailored to their lifestyle.

REFERENCES

Au C.D. Banking ecosystem: what do retail clients expect from the modern financial services industry? / C.D. Au, Ph. Krahnhof, L. Klingenberger // Universal Journal of Accounting and Finance. – 2022. – Vol. 10. – No. 2. – Pp. 498-508.

Crisóstomo-Berrocal T. Digital platform based on geomarketing as an improvement in micro and small enterprises / T. Crisóstomo-Berrocal, F. Sierra-Liñan, C. Carbonell-Michael // Indonesian Journal of Electrical Engineering and Computer Science. – 2022. – Vol. 27. – No. 1. – P. 395.

Fundira M. Adapting to the digital age: investigating the frameworks for financial services in modern communities / M. Fundira, E.I. Edoun, A. Pradhan // Business Strategy and Development. – 2024. – Vol. 7. – No. 1.

Geomarketing Market Definition // URL: https://www.thebusinessresearchcompany.com/report/geomarketing-global-market-report (date of request: 01/29/2025).

Komosny D. Retrospective ip-address geolocation for geography-aware internet services / D. Komosny // Sensors. – 2021. – Vol. 21. – No. 15. – Pp. 49-75.

Location-Based Marketing Statistics: Top Insights Revealed // URL: https://www.geoplugin.com/resources/location-based-marketing-statistics-top-insights-revealed/ (date of request: 01/29/2025).

Madleňák A. Geolocation services and marketing communication from a global point of view / A. Madleňák // SHS Web of Conferences. – 2021. – Vol. 92. Pp. 20-40.

Maity S. Bank branch outreach and access to banking services toward financial inclusion: an experimental evidence / S. Maity, T.N. Sahu // Rajagiri Management Journal. – 2023. – Vol. 17. – No. 2. – Pp. 170-182.

Nematli E. Electronic banking: its role and development in the modern financial system / E. Nematli // Znanstvena Misel. – 2024. – No. 96 (96). – Pp. 30-33.

Owen R. 48 Financial Services Marketing Statistics You Need to Know in 2024 / R. Owen // URL: https://www.invoca.com/blog/financial-services-marketing-statistics (date of request: 01/29/2025).