# Hyperlocal Marketing: Conceptual Representation Status, Technological Foundations and Directions of Development

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## ABSTRACT

Hyperlocal marketing is a modern format of interacting with customers in the offline segment of retail and services, aimed at increasing sales by optimising strategies for promoting specific products. In conditions of market saturation, traditional marketing methods become less effective, so the use of new approaches allows companies to attract customers on a point-to-point basis and adapt their offers to specific locations and audience needs. Over the past decade, interest in hyperlocal marketing as a business development tool has grown in Russia, and at the same time it has become almost entirely expressed exclusively in practical terms. Its scientific implementation has not yet been recorded.

**The purpose** of this study is to systematise the existing concepts and technologies in the field of hyperlocal marketing in order to identify its current state and prospects for development. Within the framework of the defined vector, both the technological prerequisites and requirements of this tool for ensuring the basic process in the field of offline retailing are considered, and an empirical basis for the inductive-deductive analysis of the subject field for the formation of patterns of consumer behaviour management and optimisation of the marketing policy of business agents is formed. In the course of the work, it was found that hyperlocal marketing in retail is highly dependent on the development of the Internet of Things (IoT). The use of such technologies can improve customer interaction, increase service levels and predict consumer behaviour patterns. Based on the considered instrumental and technological solutions discussed above, companies are able to create personalised marketing strategies and optimise business processes to maximise profits.

*Keywords:* hyperlocal marketing; Wi-Fi radar; retail; hyperlocal targeting; data analysis; Wi-Fi marketing

## INTRODUCTION

Hyperlocal marketing in retail is a tool that allows for the most accurate and personalised communication with consumers in specific, rather limited geographical spaces. It is based on the use of data on customers' location, their behavioural characteristics and preferences and is aimed at creating unique and relevant marketing offers.

Unambiguous definition of the term 'hyperlocal marketing' still is not available in Russian sources. Never the less, it usually describes a kind of marketing aimed at attracting potential customers from a limited area, usually within a radius of several kilometres from the business location [1–2]. In foreign literature, hyperlocal refers to a form of targeted and niche marketing aimed at consumers in a specific neighbourhood, city or even a specific building [3–4]. Despite a larger number of international research works compared to domestic ones, the designated problematics beyond Russia is covered very fragmentarily. The reason is that consideration of hyperlocal marketing began relatively recently, only in the last decade, however, at the same time, currently, a number of companies have already successfully used in practice the relevant tools.[1]

Hyperlocal marketing is becoming increasingly important in the light of development of the Internet of Things (IoT) and emergence of a number of innovative technologies such as global navigation systems, Wi-Fi radars, mobile applications and geomarketing platforms that allow retailers not only to locate their customers, but also analyse their behaviour, preferences and shopping habits in real time [5]. French scientists G. Cliquet and J. Baray explained the way this type of marketing develops along with the emergence and rapid widespread of smartphones [6].

The scientific study of hyperlocal marketing in retailing is important for understanding its impact on consumer buying behaviour, effectiveness of marketing campaigns, improvement of customer service, as well as development of new methods of market analysis and demand forecasting. In light of a highly competitive retail environment, where customers expect personalised offers and high levels of service, hyperlocal marketing constitutes an important mechanism to meet the demands of the target audience [7]. The given study is aimed to increase knowledge of the impact of existing technologies in the field on consumer behaviour, optimise marketing strategies and develop solutions to elaborate retail and service performance.

A deep understanding of hyperlocal marketing could lead to more effective forecasting and adaptation to changes in the market, which becomes an important aspect of successful development. Besides, the use of hyperlocal marketing in retail might help increase conversion and customer loyalty through a more accurate and personalised approach to the audience.

## TECHNOLOGIES OF HYPERLOCAL MARKETING
### Wi-Fi-marketing

Wi-Fi marketing is a tool that uses active Wi-Fi radar technology to attract consumers and increase sales. It allows retailers to provide their customers with access to the Internet and, accordingly, connect with them through various communication practices (e. g., through messages in mobile applications, e-mail newsletters, push-enabled notifications, etc.). [8]. Wi-Fi marketing enables companies to effectively use Wi-Fi networks to collect data about visitors, their preferences and behaviour, which in turn helps to create personalised marketing campaigns and improve service. A key element of Wi-Fi marketing is

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[1] Hyperlocal targeting. Hunch. URL: https://www.hunchads.com/solutions/hyperlocal-targeting (accessed on 23.06.2024); Hyperlocal Targeting. Consumer Intelligence Group. URL: https://consumerig.com/hyperlocal-targeting-and-retargeting/ (accessed on 24.06.2024).

active Wi-Fi radars, through which there is constant interaction with customers' devices. This enables businesses to collect customer data, analyse customer behaviour, make per-

*All methods of hyperlocal targeting contribute to increasing the effectiveness of advertising campaigns, improving customer interaction and increasing conversion [10]. This is of especial importance in a high-competition environment: since personalisation and relevance become key factors of marketing success.*

sonalised offers and recommendations.

According to the data of research, more than half of the customers prefer to stay longer in entities, or premises, which open up for visitors a free access to guest Wi-Fi without password. In the meanwhile, these customers do not mind, that they provide their personal data for the access to the internet potentially used for targeted marketing, which in the final analysis will bring financial opportunities to all parties involved. It is interesting to note that the same people are also the ones who are most likely to make a profit from the business activities in the end [8]. Businesses have the opportunity to consider which information they would like to collect, meanwhile customers may choose what information they would like to reveal: e.g. phone number or email address [9].

There are a few methods to collect data for Wi-Fi marketing purposes:

• Registration for connecting to the Internet: during the process of connecting to the Wi-Fi network, customers are requested to provide their personal data (name, email address and phone number), which may be required for fu-

ture interaction.

• Analysis of user behaviour. Wi-Fi marketing can be used to collect information about how often customers use the Wi-Fi, how long they browse the internet and which websites they visit. This information could be useful for the feedback on the users' Internet activity and for identifying trends.

• Conducting surveys. Companies may provide visitors with the access to online surveys via their own Wi-Fi network. This would allow companies to collect additional data from their customers, including information about their browsing habits and preferences.

• Audience segmentation. Such information can be used to identify narrower sustainable groups based on online behaviour, age, gender, etc.

Currently, hyperlocal targeting is the primary method of Wi-Fi marketing. It allows companies to identify exact locations of potential customers and a method of targeting advertising efforts to their specific whereabouts. Excluding locations where the target audience is not present helps to optimise advertising budgets and focus on more promising locations and/or areas. Narrowing the distance by setting a radius around a shop or area allows marketologists to pinpoint which consumers are nearby and may be interested in the company's products or services. Key location queries synchronised with external data increase the relevance of advertising messages, provide a more precise accuracy in finding out the needs and interests of the target audience.

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**Triangulation via Wi-Fi-radars**
The principle of determination of the loca-

tion of a potential customer to whom a message should reach is the backbone for hyperlocal marketing. Undoubtedly, current businesses successfully use a variety of tools (provided by mapping services) that target advertising messages to specific users located in a certain area. The relevant tools detect location systems equipped with navigation devices, smartphones and tablets. However, due to lack or poor signal permeability through walls and ceilings of buildings, this method is not always effective. This poses a need for more reliable methods of positioning in closed spaces.

The technology of passive Wi-Fi radars is based on conventional Wi-Fi routers and the principles of triangulation. Triangulation by means of Wi-Fi routers makes an effective geolocation that utilizes Wi-Fi networks and is based on measuring the signal transmission time between hotspots and a device to determine the latter's location and the distance to it (see *Figure*) [11–12].

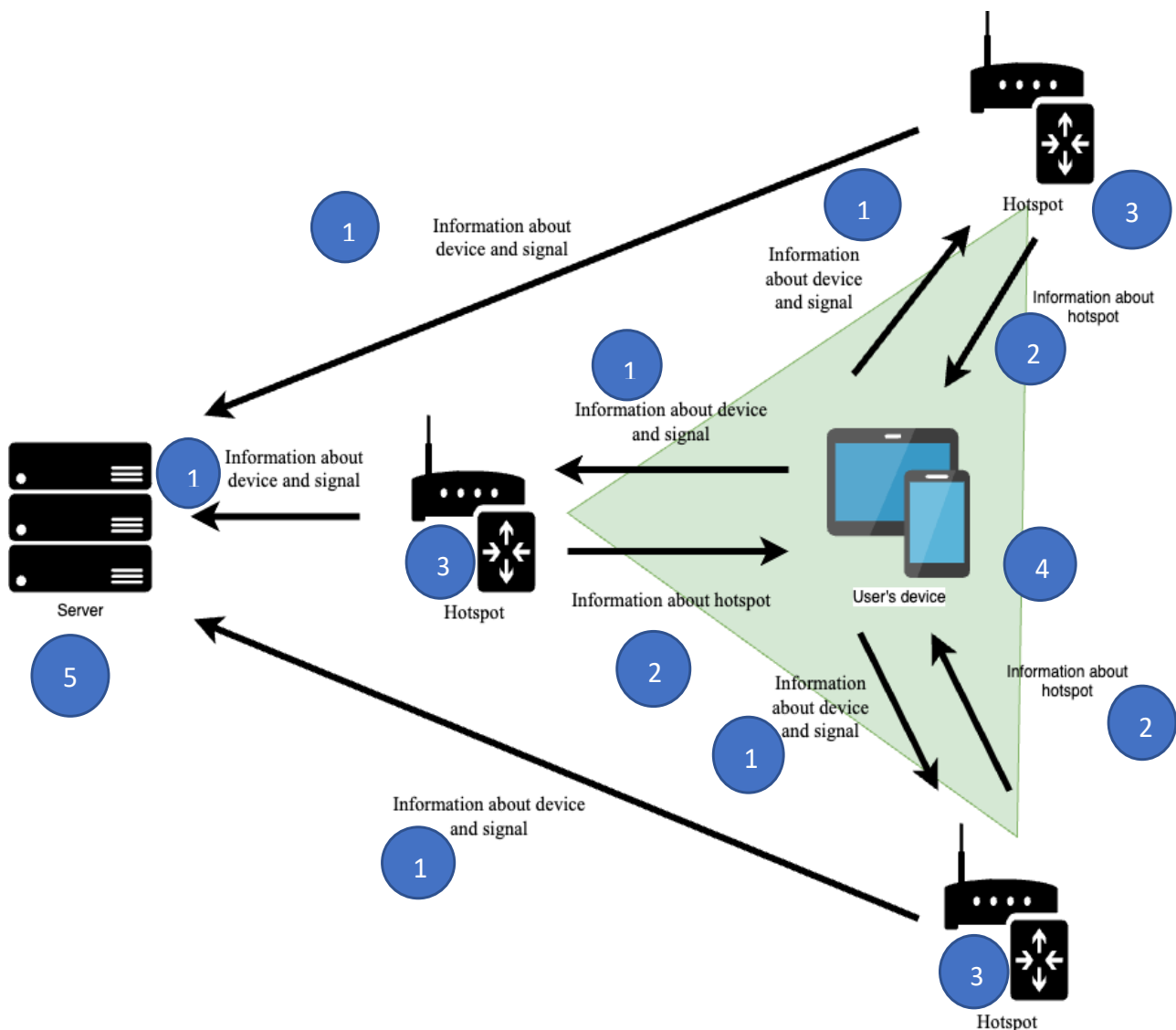To improve accuracy packet time stamping and phase comparison are used. Triangulation



*Fig.* **Triangulation via Wi-Fi routers**

works in areas where GPS signal is not available. The result depends on the density of hotspots, obstacles, and other environmental factors.

Involving the use of Wi-Fi router data to analyze human behavior and understand human habits can provide valuable information for businesses.

The main benefits of using triangulation via Wi-Fi routers include wide coverage and affordability. However, the following aspects must be taken into account [13]:

• the accuracy of the result depends on the density of access points in the vicinity of the clients' devices;

• precision can be reduced by influencing factors such as, for example, low number of radars or their distance from each other;

• Wi-Fi signal is susceptible to interference, but modern routers are adapted to this, the signal strength determines the proximity of the device to the hotspot;

• for correct positioning at least three Wi-Fi hotspots and their location information are needed;

• poor triangulation may occur with time delays due to multiple unconnected hotspots and slow Internet signal speed.

Wi-Fi triangulation technology requires accurate distances and signal strength to effectively establish device coordinates. Wi-Fi radar method can obtain information about a person, open up prospects for analyzing his or her behavior and habits even if he or she is not connected to a hotspot. Devices belonging to a specific person communicate with the Wi-Fi router even when there is no direct connection, due to non-stop network monitoring and router location detection to optimize data transmission.

## Big data analytics and recommendation systems in retailing

Big data analytics in hyperlocal marketing is the process of extracting valuable insights from a broad spectrum of information generated through the use of the retail service technologies or spheres of services described above. As the massive amounts of data grows (on consumer purchases, transactions, social media interactions, and, what not, even on the weather) which are collected by companies, its processing and interpretation becomes increasingly complex and cannot be done manually [14]. This is why automated methods of information analysis play a key role in making effective management decisions, optimising business processes and improving customer satisfaction, which in combination becomes a

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vital necessity for businesses.

One of such methods is demand forecasting. This method uses Big Data to analyse purchasing trends, consumer preferences, seasonal fluctuations of consumer activity, and other relevant factors, which helps retailers predict demand for specific goods and services [15]. It also contributes to retailers more information on optimised levels of inventory, as well as adjust discounts offered, develop marketing campaigns and, as a result, it increases business efficiency and satisfaction of target audience.

Corporations are able to evaluate data on consumer preferences and behaviours aiming to improve customer interactions and increase the probability of repeated purchases.

Companies can maximize profits by means of optimising price formation based on analysis of their competitive environment, demand, and other factors. Utilising sales, demand, and forecast information might enable retailers to adequately assess inventory and avoid surpluses and shortages. Analysing customer information could help create accurate profiles and improve marketing strategies.

Recommendation systems become one of the most common applications of Big Data analytics. They are a set of algorithms, programs and services which analyse user preferences and behaviour and try to predict what might be of interest for them. In retail sphere, this complex and multifaceted process is characterised by a number of peculiarities, which are carefully considered, so that retailers could effectively use information and make justified solutions, improve business processes and interact with consumers.

## USE CASES OF HYPERLOCAL MARKETING
### Targeted advertising

Targeted advertising in hyperlocal marketing is a special type of communication in the framework of which advertisings are deleivered only to users who are located within a certain radius of destination of the businesses or the objects of its interest. As understood traditionally by marketing experts, this type of advertising involves selecting a target audience based on demographics, interests, behaviour and other parameters, regardless of the physical location of the users. In contrast, hyperlocal targeted advertising includes an element of geographic affinity. It aims to embrace audiences that have definitely visited certain territories (zones) before, becoming more accurate and relevant to specific moments in time and place. This increases the effectiveness of advertising by taking into account both geographical and behavioural characteristics of consumers.

Typical business cases of its use in hyperlocal marketing can be considered in the following venues:
• café or restaurant adverts about menu, promotions and reviews, which is relevant for users in the neighborhood;
• shop or salon adverts with information about availability and prices for users looking for such products or services in a particular area;
• event adverts with information about the date, time and location of events for users interested in the topic and located in a particular area.

Thus, to set up targeted advertising in hyperlocal marketing it is necessary to use special tools and platforms that allow you to determine the geographical location of consumers and tune up the display of advertising correspondingly, however in addition to this criterion a few other criteria should be used [16]:
• the following socio-demographic characteristics should to be considered –
• gender, age, education, income, etc;
• interests should be taken into consideration — hobbies, pastimes, preferences, needs, etc;
• behaviour should be taken into account: visiting websites, watching videos, installing apps, buying products, etc;
• retargeting, which means to show adverts repeatedly to those who have already interacted dealing with a certain business or product.

A few prominent Russian and international business enterprises have already effectively employed hyperlocal targeting strategies, such as:
• Yandex.GO, a division of Yandex, which utilises this technology to display advertisements for promotion of its services during rush hours at train stations, airports and other locations, so that potential customers may require an instant and convenient means

of transportation or modes of food delivery. The advertisements contain information on the cost of services, waiting time spans and benefits of the service.[2]

• IKEA (Sweden) introduces in Russian areas with operating or soon-to-be opened shops the hyperlocal targeting system to focus on advertising of its products and services: product array characteristics, warranty conditions, information on how-to-assembly furniture, as well as delivery and other benefits of cooperation with the company.[3]

**Customer identification in Wi-Fi networks**
Customer identification over Wi-Fi is the process of confirming the identity of a user who connects to a free guest network in a public place such as a café, restaurant, hotel, shopping mall, etc. The corresponding identification, related to compliance with legal requirements regarding security and Internet access control, is also used for marketing purposes to collect customer data, analyse their behaviour and send them personalised offers and increase their loyalty.

To identify a customer via Wi-Fi in marketing, they use a special login page, where the following authorisation methods are offered:

• through social networks (VKontakte, Google, etc.), where the user authorises access to his/her profile or friends;

• via email, with address confirmation by means of a link;

• via text messages, by receiving a confirmation code;

• through the use of a voucher or, so-to-say, an identity document, as part of personalisation, when accessing Wi-Fi.

Here are a few examples of customer identification cases in Wi-Fi networks related to some strong business players:

• Starbucks coffee shop chain promotes its products and services within a specific location by means of advertising on the Wi-Fi-network login page through identification via email address. The advertisement contains information about new products, promotions, bonuses and loyalty programme. Besides, Starbucks collects data on attendance, session length, preferences and feedback from visitors.[4]

• Aeroflot, which identifies passengers by their ticket numbers, to provide access to onboard Wi-Fi during the flights. This makes it possible to control the quantity and quality of connected users and offer them additional services such as food ordering, entertainment, flight information, etc.[5]

In addition, having identified the customer, some businesses use triggers to attract his/her attention in the future. For example, a customer receives messages about short-term promotions and gets offers to visit a store or establishment when in a Wi-Fi coverage area.

**Recommendation systems**
Recommendation systems in retail are the systems that analyse data about customers' purchases, browsing, ratings and other actions in physical shops, so that they suggest products or services that may interest customers or meet their needs. In this way, offline retailing boosts customer satisfaction and loyalty as well as it increases average cheque and sales.

Such systems can be categorised according

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[2] Right on targeting by audience segments.
URL: https://yandex.ru/adv/news/tochno-po-adresu-giperlokalnyy-targeting-po-segmentam-auditoriy (accessed on 01.07.2024).

[3] How IKEA evolved its consumer experience by integrating online and offline. iProspect.
URL: https://www.renascence.io/journal/how-ikea-uses-technology-to-improve-customer-experience-cx-in-retail (accessed on 01.07.2024).

[4] Starbucks Tests Wi-Fi Sign-Up That Asks For Email Addresses. Marketing Dive.
URL: https://www.marketingdive.com/news/starbucks-tests-wi-fi-sign-up-that-asks-for-email-addresses/519940/ (date of call: 01.07.2024).

[5] Information technologies of Aeroflot. TAdviser.
URL: https://www.tadviser.ru/a/435523 (date of call: 01.07.2024).

to the type of information collection and the channel of communication with the customer, i.e. to distinguish among them:

• systems that use information about purchases, views or evaluations (collected through reward cards, mobile applications, QR codes and other methods) that provide confirmation of users' identity. Recommendations can be delivered to consumers via text messages, push notifications, emails and other methods of communication channels;

• systems that operate on data from third-party sensors or devices, providing recommendations through digital screens, audio messages, interactive booths and other visualisation tools;

• systems that utilise information about a client's social networks, interests or personal characteristics collected through online profiles, surveys, games, etc.;

• systems that use information from third-party sensors or devices to provide recommendations through digital screens, audio messages, interactive stands and other visualisation tools.

Referrals can also come through personal advisors, bots, chat rooms and other means of communication.

Here are a few examples of offline-retail recommendation systems that are used by Russian and international companies:

• Recommendation system 'Vkusvill' is able to analyse customers' purchase histories, views, reviews or demand and it suggests products that may be of interest for them. The system uses information about other customers' purchases of the same or similar products to display video and text blocks on digital screens in the shop "Customers, who bought this product, also bought…" and "Some similar products you might like to buy…"[6]

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[6] Vkusvill Case: How to Increase Profits and Make Friends with Customers with the Help of a Recommender System. Retail.ru. URL: https://www.retail.ru/cases/dva-v-odnom-kak-s-pomoshchyu-rekomendatelnoy-sistemy-uvelichit-pribyl-i-podruzhitsya-s-pokupatelyami/ (accessed on 02.07.2024).

• IKEA's recommendation system analyses both data on social networks, interests and personal characteristics of customers collected through online profiles, surveys, games and other interaction methods, and information on the shopping locations, movement or even custom-

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ers' eye gaze directions (which products they focus their special visual attention), obtained by means of video cameras and sensors. The system offers recommendations through chatbots, digital screens, audio messages, interactive stands or other means of communication and visualisation [17].

However, along with the advantages described above, recommendation systems have a few disadvantages, such as problems of cold start, data sparsity, scalability, etc., which require constant attention and optimisation.

### Smart staff allocation

Wi-Fi-radars help to improve staff performance. The company is able to assign employees to the areas where their special skills, experience and preferences will be most needed. This will allow the company to adapt to the dynamics of consumer demand and take into account the professional characteristics of each employee.

Optimising location for the staff by means of allocating employees according to the number of visitors in particular areas can increase customer loyalty, reduce the number of complaints

and increase conversion rates. Moving employees according to the customers' attendance or specifics of the working spaces boosts work efficiency, ensures labour safety and cleanliness [18]. Such activities help to reduce costs, increase staff motivation and improve customer service.

To implement smart staff allocation, companies resort to various technologies and methods, for example, special software that analyses data from Wi-Fi radars and other sources and eventually makes recommendations. Such systems are also used to monitor and evaluate the work of the workforce in order to provide feedback for encouragement, support, or, on the contrary, suggest penalties for inactivity.

## DISCOURSE ANALYSIS

Hyperlocal marketing is a promising marketing trend for offline retailing. The findings of this study demonstrate that companies resort to a variety of technologies in order to analyse consumer behavior aiming to enhance the shopping experience and increase sales. In Russia, however, this marketing method has not yet achieved the same level of popularity compared to its traditional international counterparts. A vast majority of retail companies prefer to keep to traditional methods of marketing strategies due to scarce information on advantages of this novel approach, as well as due to lack of awareness regarding its underlying technologies. A short supply of clear and robust theoretical reflection in Russian academic circles furthermore hinders the discourse and integration of hyperlocal marketing strategies, which impedes capacity of business communities to enhance the efficacy of their marketing strategies.

Notably, foreign sources of information contain descriptions of technologies, ways and cases when hyperlocal marketing was implemented, however companies often conceal

their developments in this area to sustain its competitive priorities. The development of artificial intelligence, machine learning and the Internet of Things speeds up the development of new solutions, such as cashierless shops. The potential of hyperlocal marketing is based

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on the influence such systems, as Internet of Things, data analytics, artificial intelligence, and development of mobile and smart technologies. Forecasting of this trend enables to obtain a more profound comprehension of its fundamental technologies and their impact on marketing trends.

It is also noteworthy that the proliferation of hyperlocal marketing may be hindered by the fact, that it is frequently misinterpreted as a form of relationship marketing.[7] While both methods aim to build long-term customer relationships, hyperlocal marketing is distinguished by its conceptual differences. It makes offers and promotions delivered to customers only when they are in close proximity to the business, increasing the possibility for immediate action. Furthermore, content can be

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[7] Relationship marketing is the management of building long-term mutually beneficial relationships with key partners which operate interactively in the market: customers, suppliers, distributors. The functioning of relationship marketing marked a shift in the marketing paradigm: the transition from thinking exclusively in terms of competition and conflicts towards the way of thinking in terms of interdependence and co-operation.

tailored to local conditions in real time, enhancing its relevance and appeal to the local population.

To accelerate the introduction of hyperlocal marketing it is advisable to implement new models, methods and algorithms aimed at improving the considered solutions. The options described above for using current technologies allowed the authors of the article to determine the vector of further research.

It was revealed that this topic is considered (albeit fragmentarily) by representatives of domestic professional community. The sources studied during the work contain similar hypotheses and note the accelerated development of artificial intelligence and online goods delivery services in retail [19–20]. This thesis is positioned as a starting point for further research in the field of hyperlocal marketing.

## CONCLUSION

The future of hyperlocal marketing is largely attributed to the rise of Internet of Things, by means of which retailers gain extensive data on customer behaviour and preferences, as well as their previous purchases and habits. This enables to create customised and unique marketing strategies. Thanks to the Internet of Things, it becomes possible to arrange smart retail spaces that use various, Internet of Things-related devices to collect a proper data about users and optimise their shopping experience.

A significant influence on the development of hyperlocal marketing has become thanks to 'Wi-Fi radar' technology, which uses Wi-Fi signals to monitor the movement of people indoors, helping companies to improve customer interactions. By analysing data from smart devices and Internet of Things, it is possible to create digital twins of shops and customers and predict the latter's behaviour. Smart devices also help to optimise product assortment and marketing strategies, while information on

customer movement in-store is used to improve service. These innovations have a huge potential to transform traditional marketing and retail management practices.

*By analysing data from smart devices and Internet of Things, it is possible to create digital twins of shops and customers and predict the latter's behaviour.*

Having studied the identified trends and existing tracks in hyperlocal marketing from the perspective of developing Internet of Things technologies, it is possible to talk about a very particular pin-point use of marketing strategies in the future. The results of the study indicate the possibilities of further in-depth analysis of the impact of Internet of Things on hyperlocal marketing and finding ways to improve the effectiveness of communication between retailers and customers. It is worth pointing out, that implementation of hyperlocal marketing technologies can significantly improve the efficiency of interaction with consumers through increasing their engagement and loyalty. This, in turn, will lead to increased sales and improved financial performance of companies. Moreover, the active use of Big Data analysis and predictive analytics of information received from various devices will allow for more accurate demand forecasting and optimisation of inventory management, reducing both the risks of excessive stocks and shortage of goods.

It is also important to note that investment in the development and implementation of personalised marketing strategies and smart technologies can lead to a long-term economic effect, which results into an increased return

on investment and business competitiveness. Thus, the results of this study are aimed not only to expand the understanding of hyperlocal marketing, but also to provide a basis for further research in this area, which opens up opportunities for improving marketing practices and developing innovative approaches in the retail segment.

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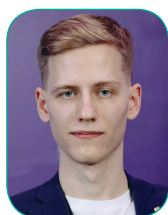
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