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IMPLEMENTING ARTIFICIAL INTELLIGENCE IN THE BEAUTY INDUSTRY: INNOVATIVE APPROACHES TO PERSONALIZATION AND OPTIMIZATION OF MANICURE SERVICES

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A B S T R A C T

Today, artificial intelligence (AI) is having a significant impact on the development of the beauty industry, including manicures. This article examines innovative approaches to personalizing and optimizing manicure services using AI. Current trends and examples of AI implementation in nail salons are analyzed, and the prospects and challenges associated with integrating AI into this field are discussed.

K E Y W O R D S

Artificial intelligence, beauty industry, manicure, personalization, optimization, innovation.

INTRODUCTION

Scientific Novelty. This paper is the first to systematize the use of artificial intelligence in the beauty industry, with a focus on manicures. It demonstrates how AI is used to personalize services, optimize business processes, predict trends, and train professionals, opening up new opportunities for improving customer service and the competitiveness of beauty salons.

Modern The beauty industry is undergoing significant changes thanks to the implementation of artificial intelligence (AI), particularly noticeable in the field of manicure, where AI facilitates personalization of services and optimization of business processes.

AI-powered systems analyze clients' preferences and browsing history and offer personalized recommendations on nail designs, color selection, and application techniques. This creates a unique customer experience and increases service satisfaction, for example, at Perfect . Corp. and Revieve are developing solutions using AI and augmented reality (AR) that allow customers to virtually “try on” different nail designs and receive personalized care recommendations [1].

AI also helps optimize internal processes, reducing the workload on staff and increasing efficiency:

- the system automates client registration and management of technician schedules;
- accounting of materials and analysis of financial indicators is carried out [2].

The introduction of AI offers enormous potential for improving service quality, but it comes with challenges, including ensuring customer data privacy, overcoming technological complexities, and market acceptance. Nevertheless, AI promises to further revolutionize the manicure industry by combining aesthetics with technological efficiency.

Artificial intelligence (AI), defined as the creation of systems that mimic human intelligence (perception, learning, decision-making), is increasingly being applied in the beauty industry. In

manicures , AI is being used to personalize services, optimize business processes, and, in some cases, automate work. The study "The Use of Artificial Intelligence in the Nail Industry: From Trend Forecasting to Process Automation" confirms that AI Maybe significantly improve quality services V manicure salons [3].

Personalization is a key aspect of modern service. AI analyzes customer preferences and browsing history, offering personalized recommendations on design, colors, and application techniques. Systems like YouCam Makeup by Perfect Corp. , uses AI to allow users to virtually try on various nail designs and receive recommendations that match their style and appearance. This creates a unique customer experience and increases satisfaction.

AI significantly contributes to the optimization of salons' internal processes, reducing staff workload and increasing overall efficiency. Systems automate client booking and stylist scheduling. They also support material accounting and financial performance analysis. The Zenoti platform , for example, offers innovative AI technologies for automating salon management, including marketing and analytics.

A number of companies are integrating robotics and AI directly into the manicure process . For example, Umia uses robotics and AI to automatically apply polish, potentially speeding up the process and reducing costs.

However, successful implementation requires hybrid models where algorithms complement, rather than replace, human specialists, thereby maintaining a creative and individualized approach to each client.

Table 1 - Application of AI in the nail industry

Direction of AI application	**Description**	**Examples of technologies**
Personalization of services	Analyzing customer preferences and providing personalized recommendations	You Cam Makeup, Revieve
Business process optimization	Automate client registration, schedule management, and inventory management	Zenoti , Emitrr
Robotic manicure systems	Using AI and robotics to automatically perform manicures	Umia , Clockwork

The implementation of AI is enabling a breakthrough in service personalization, process automation, and analytics in nail salons, as demonstrated by practical results:

1. Virtual fitting and personalization (AR technologies). AI systems such as YouCam Makeup (Perfect Corp.), allow customers to virtually try on different nail designs and receive personalized recommendations.

Case " Luxe " Nails : Implementing virtual try-ons reduced average service time by 15% and increased repeat visits by 20% due to improved customer satisfaction [4].

2. Robotic manicure systems. AI-powered robotics automates the process of polish and design application, ensuring high precision and speed.

RoboNails case : the use of the Umia robotic system increased the salon’s throughput from 30 to 50 manicures per day and reduced material consumption by 10% [5].

3. Business process optimization (management automation). AI platforms automate recording, scheduling, material accounting, and financial analytics, increasing operational efficiency.
Case " Elite " Beauty ": the implementation of the Zenoti platform (zenoti.com) has reduced administration time by 40% and increased the workload of specialists by 25% [6].
4. Trend analysis and demand prediction. AI analyzes large volumes of data (social media, reviews, seasonality) to predict future trends and develop personalized offers.
Case " Nail " Trends »: A salon chain using AI to analyze social media increased sales of seasonal nail polish collections by 30% by timely preparation of popular designs.
5. Training and professional development for technicians. AI systems are used to train staff through virtual simulations and performance assessments, accelerating professional growth.
Case Study " NailAI " Academy ": Using virtual simulators to practice complex manicure techniques allowed beginners to quickly reach a professional level, reducing the number of errors in real work.

Table 2 - Practical application of AI in the manicure industry

Direction of AI application	Description	Examples of technologies	Effect
Virtual nail design try-on	Personalization of services through virtual fittings	YouCam Makeup	Reduction in service time by 15%, increase in repeat visits by 20%
Robotic manicure systems	Automatically perform manicure with precision	Umia	Increase in the volume of services by 66%, reduction in material consumption by 10%
Business process optimization	Automation of client registration, scheduling, and material accounting	Zenoti	Reduction of administration time by 40%, increase of workload of specialists by 25%
Trend analysis and needs forecasting	Forecasting popular designs and techniques	Big Data and AI platforms	Increase in sales of seasonal collections by 30%
Training of masters	Virtual simulators and performance assessment	NailAI Academy	Quickly master new techniques, reduce errors

The introduction of AI promises to revolutionize the nail industry, opening up new opportunities but also presenting significant challenges.
Prospects for AI implementation include:
1. Increased service personalization. AI enables highly personalized recommendations for design, colors, and techniques, taking into account not only customer preferences but also their hand shape, skin tone, and clothing style. This is key to creating a unique experience and increasing loyalty.
2. Optimizing business processes and reducing costs. Automating key processes (scheduling, scheduling, inventory management, and financial analytics) allows salons to improve efficiency and reduce operating costs.
3. Forecasting trends and increasing competitiveness. AI can analyze massive amounts of data (social media, reviews) to identify popular designs and predict new trends. This allows salons to promptly adapt their offerings and remain competitive.

4. Training and professional development of specialists. AI-based training devices and virtual simulators provide specialists with the opportunity to safely practice complex techniques, accelerating the learning process and reducing the number of errors [7].

Challenges of AI implementation include:

1. Ethical and legal issues . Maintaining customer privacy, protecting their personal information, and ensuring algorithmic transparency to prevent bias and discrimination are essential.
2. High initial investment . Developing, implementing, and maintaining complex AI systems requires significant financial investment and human resources, which can be a barrier for small and medium-sized salons.
3. Acceptance of technology by clients and staff. There is a risk of mistrust of automation on the part of clients and technicians. Many fear the loss of the "human factor," which is valued in the service industry.
4. Limitations of technology. AI and robotics cannot currently fully replace the creativity and manual skills of professionals. The optimal model remains the synergy of technology and human expertise.

Table 3 - Prospects and challenges of implementing AI in the manicure industry

Prospects for the implementation of AI	Challenges and Limitations	Examples
Personalization of services	Customer distrust of automation	YouCam Makeup
Business process optimization	High initial investment	Zenoti
Trend forecasting	Limitations of technology	Big Data analysis
Training and professional development	The need for staff training	NailAI Academy
Improving competitiveness	Ethical and legal issues	Social media analysis

The introduction of artificial intelligence into the beauty industry, and manicures in particular, opens up new opportunities for personalizing services, optimizing business processes, and improving customer service. An analysis of theoretical and practical aspects shows that AI enables:

- enhance the personalized customer experience by analyzing preferences, hand shapes, skin color, and clothing style, providing more accurate recommendations for nail designs and application techniques;
- to optimize internal processes of beauty salons, including automation of client registration, management of the schedule of specialists, accounting of materials and financial control, which helps to reduce costs and increase work efficiency;
- predict trends and adapt to changes in consumer demand by analyzing social media data, customer reviews, and popular designs, which increases the competitiveness of salons;
- train and improve the skills of specialists using virtual training devices and simulators, which accelerates the acquisition of new techniques and reduces the likelihood of errors.

However, the implementation of AI is associated with a number of challenges: the need to maintain data privacy, high initial investments, limited creative potential of robotic systems, and the need for personnel training.

Therefore, integrating AI into the nail industry requires a balanced approach, where technology complements, rather than replaces, the human factor. Combining innovation and professionalism allows beauty salons to create unique customer experiences, increase customer loyalty, and optimize business processes.

Overall, the use of AI in manicure opens up opportunities for further industry development, the introduction of new services, and improved customer service, making technological innovation a crucial tool for the modern beauty industry.

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