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INNOVATIVE POTENTIAL FOR THE DEVELOPMENT OF PERMANENT MAKEUP BASED ON TECHNIQUE IMPROVEMENT AND CLIENT SUPPORT

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Abstract. *The article analyzes the innovative potential for the development of permanent makeup through the refinement of application techniques and the implementation of modern client support strategies. The aim of the study is to identify and systematize technological innovations in the field of permanent makeup, as well as explore contemporary methods of client interaction that together form a new model for delivering aesthetic services. The research employed general scientific methods of cognition, such as analysis, synthesis, modeling, and forecasting. The findings indicate that innovation in permanent makeup encompasses both technological advancements in application techniques and the digital transformation of client communication processes. The study highlights that the technical component, particularly microblading, plays a crucial role in ensuring high-quality aesthetic outcomes. Modern technologies include precise anatomical sketching, the use of ultra-fine needles, and specialized pigments that guarantee a natural appearance and long-lasting color. Special attention is given to a patented technique for natural powder brows, which combines soft shading, precise pigment application, and fast healing without scabbing, preserving up to 90% of the pigment after the first session. This method proves effective for mature skin, and innovations in procedure execution can be just as decisive for service quality as technical equipment. The study also reveals that digital technologies play a significant role in shaping modern service experiences. Artificial intelligence (AI) enables skin condition analysis, the identification of problematic areas, and the creation of personalized care recommendations. Augmented reality (AR) allows clients to visualize expected outcomes before the procedure, reducing uncertainty and increasing confidence in their choices. The practical value of the research lies in establishing a new paradigm for aesthetic services through the integration of advanced technologies and innovative client service approaches.*

Keywords: *permanent makeup, innovation, digital technologies, microblading, client experience.*

Introduction

The beauty industry has shown rapid development over the past decade, as confirmed by statistical data: according to analytical reports, the global beauty market is expected to surpass $580 billion by 2027 [7], with the aesthetic services and personalized solutions segment growing particularly fast. In this context, the field of permanent makeup stands out as it has evolved from a supplementary procedure into a key element of personal style, a form of self-expression, and a care strategy.

New techniques, including microblading and its modern variations, have significantly improved aesthetic outcomes – this is evident not only in professional

studios but also in people's appearance, where brow shape, color, and structure are now harmonized and long-lasting. Technology is no longer a secondary factor—it has become a catalyst for redefining beauty standards, producing results that appear naturally integrated rather than technically applied. This breakthrough has been made possible by the creative potential of specialists who combine scientific approaches, technical tools, and artistic vision to develop new techniques that respond to modern client needs. These innovations extend beyond the application of permanent makeup to the entire client support system: the use of artificial intelligence, chatbots, and augmented reality is fundamentally transforming the service experience. Every stage is being reshaped – from the initial consultation to the decision-making process – as technology enhances precision, predictability, and personalization.

This study analyzes key innovations in both technological and communication dimensions, which not only improve outcomes but also establish a new quality standard in aesthetic services, positioning client satisfaction as a key marker of professional success.

Literature Review The topic of innovative potential in permanent makeup development through improved techniques and client support remains underexplored in academic literature. It is a niche area that has only recently begun to attract scholarly attention. Therefore, the study draws on two core categories of sources: the first focuses on general innovations in permanent makeup, and the second includes scientific research on specific technologies, pigments, risks, and more. Additional sources were reviewed to cover the application of artificial intelligence and emerging communication technologies within the beauty industry.

The first category includes a significant study by Marwah M. K., Kerure A. S., and Marwah G. S. [5], who provide a thorough analysis of microblading biomechanics, emphasizing skin types, tools, and techniques. Hetzler L. and Sykes J. [1] explore the anatomical features of the brow area, which are essential for achieving aesthetic results in permanent makeup. Høgsberg T. and co-authors [2] examine pigment composition, highlighting the skin's reaction to nanoparticles and the associated risks. Mao J. and Dejoseph L. [4] focus on innovative approaches to tattoo and permanent makeup

removal – a topic gaining relevance due to the rising trend of correction and full removal of unsuccessful procedures.

The second category addresses modern technological innovations that are reshaping the industry. For example, Jabraeili D. [3] demonstrates how artificial intelligence enables personalized solutions for clients, reducing errors and improving the overall experience. McKinsey & Company [6] provide guidance on how beauty companies can effectively scale AI and offer insights into current industry trends in their analytical report [7]. Rigney S. [8] and Skinmatch [9] highlight the role of chatbots as new communication channels in the beauty field – an important development for PMU artists, many of whom work freelance and interact with clients primarily online. Specialized literature from professional online platforms such as Skinmatch.com [8; 9] and TheBrowMaster.net [10] was also used, offering expert analysis and practical tips on the latest techniques in permanent makeup. Despite growing interest in the topic, a systematic, comprehensive approach to studying innovation in PMU is still lacking. Relevant materials were therefore collected, analyzed, and structured to provide a coherent overview of the issue within the selected theme.

The study utilized general scientific methods of cognition, including analysis, synthesis, induction, deduction, and a systems approach, allowing for a thorough exploration of innovative processes in permanent makeup. The theoretical and practical basis of the research was a patented technique for natural powder brows, chosen as the foundation for analyzing technological progress in the field due to its precision, effectiveness, and adaptability to individual skin characteristics. This technique was used to draw comparative insights into other innovative methods in PMU, alongside an examination of the role of digital tools such as artificial intelligence, augmented reality, and chatbots in the client support process.

Purpose of the article

The aim of the study is to identify and systematize the technological aspects of innovation in permanent makeup and explore new approaches to client communication that are shaping a fundamentally new model for delivering aesthetic services.

Research results

The field of permanent makeup (PMU) is undergoing dynamic growth, driven by the introduction of advanced technologies, improvements in professional training, and increasing demand for personalized aesthetic solutions. Special attention should be given to innovations in brow design techniques, as the brow area serves as a dominant facial feature and plays a crucial role in shaping expression and overall harmony. Modern techniques such as microblading, nano brows, powder brows, and ombre brows not only expand the range of aesthetic possibilities but also adapt to the individual physiological characteristics of the client's skin, thereby enhancing the quality and longevity of the results [10]. These techniques are explored in more detail in Table 1.

Table 1. Innovative techniques in permanent brow makeup

Technique	Description, skin type, duration, and features
Microblading	A traditional manual technique performed with a fine blade that creates hair-like strokes. It is most effective for normal or dry skin, as oily skin tends to cause faster pigment fading. The effect lasts 12–18 months. While the result appears highly natural, it requires regular touch-ups.
Nano Brows	An advanced machine-based technique using ultra-fine needles. Suitable for oily and mature skin, as it allows deeper pigment penetration and better retention. Results last 2–3 years. This method delivers a long-lasting yet natural look and is increasingly replacing microblading in the market.
Powder Brows	A pigment shading method that creates the effect of applied powder or brow pencil. Best suited for oily or combination skin. It offers a more defined appearance compared to other techniques. The effect lasts 2–3 years. This is an ideal option for clients who prefer sharply contoured and richly pigmented brows.
Ombre Brows	A variation of the shading technique, where pigment is applied in a gradient—from lighter at the brow's start to darker at the tail. Suitable for all skin types, especially oily skin. The effect lasts 2–3 years. It creates a soft, natural look with a visual sense of depth and volume. Perfect for those seeking a refined tonal transition.

Note: systematized by the author based on [10]

Microblading is a modern permanent brow makeup technique that simulates natural hairs through manual pigment application to the upper skin layers [1]. A defining feature of this method is the creation of fine, anatomically precise strokes that mimic the natural direction of hair growth. The core concept of microblading involves

step-by-step placement of strokes in varying lengths and directions, closely replicating the natural brow structure. Technically, the strokes are divided into two categories: primary (longer strokes that span the full brow thickness) and secondary (shorter strokes that fill in gaps between the primary ones). Each stroke is applied at a 45° angle to create the illusion of a hair follicle and avoid parallel lines, which appear unnatural [4].

Depending on facial anatomy and skin type, the arch shape is customized as well: higher arches are recommended for round faces or larger foreheads, while flatter arches suit oval or elongated face shapes. For this reason, a detailed consultation is conducted prior to the procedure to determine the desired shape, curve, and symmetry—an essential step in personalizing the result.

Table 2 – Key advantages of the Natural Powder Brows Technique

№	Criterion	Core Technology – Powder Brows	Other Techniques and Modifications
1	Sketch and Shape	The sketch is created with high precision, taking into account individual facial features and hair growth anatomy.	Standardized shapes are often used, not always adapted to facial features. Often result in sharp, “Instagram-style” contours.
2	Artist’s Positioning	Work is performed on each brow from the corresponding side. Ensures symmetry, precision, and better control of hand movement.	Procedure is often done from one side regardless of brow position. May lead to asymmetry.
3	Tool and Skin Impact	Ultra-thin needle that barely touches the skin. Minimal trauma, no scarring. Pigment is placed in the upper dermal layer.	Coarser needles or blades (especially in microblading). Micro-cuts, more trauma. Risk of color change and scarring.
4	Pigments and Application	Diluted pigment selected according to client’s color type. Soft transitions and natural appearance.	Often uses concentrated pigment. Results in brighter, less natural shades. Poorer color retention.
5	Healing and Aftercare	Minimal skin damage. No scabbing, flaking is light or absent. Basic hygiene is sufficient.	Frequent scabbing, itching, peeling. Requires strict aftercare and avoidance of water for 7–10 days. Uneven healing is possible.
6	Removal (if needed)	Easy laser removal due to shallow pigment placement. No residual shadows or deep pigment stains.	Deeper cuts, uneven pigment distribution (especially in microblading). More removal sessions needed. Risk of scarring and pigment color shift.

Within the scope of this study, the author highlights a refined variation of micropigmentation known as the «***Natural powder brow technique***». This approach achieves a high level of detail and natural appearance through three key components (table 2).

This technical solution produces an exceptionally natural effect, which is especially relevant for mature skin requiring a gentle pigmentation approach. The method prevents scabbing and significantly accelerates the healing process. An added advantage is the high pigment retention—up to 90% after the first session—reducing the need for follow-up corrections and making the technique an ideal choice for clients who value both natural results and efficiency.

Brow microblading is a highly precise aesthetic micropigmentation procedure based on the manual creation of hair-like strokes. Achieving a lasting, high-quality, and natural effect requires a comprehensive approach that includes the use of specialized tools for measuring proportions, careful selection of microblading pens and blades, adherence to sterile procedure standards, and choosing the right pigments based on the client's skin phototype. The main technological components are summarized in Table 3.

Service quality in the field of permanent makeup is no longer limited to technical precision, pigment quality, or the artist's skill alone. In today's environment, it increasingly depends on the level of client service, which is being transformed under the influence of digital technologies [10]. Leading professionals in the beauty industry are now implementing innovative services powered by artificial intelligence (AI) and augmented reality (AR), significantly enhancing personalization and providing continuous support throughout the client's interaction with the brand.

According to a study by McKinsey & Company [6], generative AI (Gen AI) could contribute an additional $9 to $10 billion to global GDP solely through its impact on the beauty industry. Companies that were early adopters of such technologies are already seeing clear advantages—they have become faster, more adaptive, and better at anticipating consumer needs. Meanwhile, businesses that delay AI adoption risk losing competitiveness and market share.

Table 3. Tools, technology, and pigments used in the microblading technique

Component	Description with source reference
Measuring tools	Instruments such as the Golden Mean Brow Caliper, Vernier caliper, and a T-shaped ruler that can be fixed to the forehead are used to accurately determine brow proportions. These tools help adapt the brow shape to the client's facial anatomy [1].
Microblading pen	A specialized tool that holds the microblade. It consists of a handle, an adjustment mechanism, and a blade holder. Disposable options are available. Pens come in lightweight, ergonomic, or dual-ended models, depending on technical requirements [1].
Microblading blades/needles	Blades consist of multiple needles arranged in a row. They can be flexible, hard, or hybrid. Needle count ranges from 7 to 21, with thickness between 0.16–0.4 mm. Configurations include straight, U-shaped, single-row, or double-row [1].
Scientific principle of blade function	Through capillary action, pigment is drawn into the needles. A larger number of needles increases pigment uptake. Longer needles create the base of each stroke. Larger blades with more needles are used for longer strokes [1].
Pigment holder	A plastic or metal ring container worn on the artist's finger that provides quick access to pigment without compromising the sterility of the procedure [1].
Types of pigments	Microblading uses synthetic, organic, non-magnetic pigments free from heavy metals. These are non-dispersible, which makes color retention difficult if the technique is applied incorrectly, unlike tattoo pigments based on iron oxide [2].
Pigment selection	Modern pigments are available as composite blends pre-adapted to specific skin tones. For neutral or warm-toned skin—common among individuals of Indian descent—specialized palettes are selected [2]

One of the most promising directions involves combining AR technologies with chatbots to provide virtual product try-ons and real-time consultations. As Rigney notes [8], chatbots integrated with social media platforms like Instagram are connected to the world's largest cosmetic product databases. These bots can automatically generate personalized procedure or product recommendations directly within user messages. With an adaptive question flow and AR interface, users can instantly visualize results without physically visiting a salon. This approach significantly reduces the information gap between the client and the professional, fosters a sense of control, and strengthens trust in the service.

As a result, service quality in permanent makeup today is shaped not only by manual techniques or pigments but also by next-generation digital services that provide information, personalization, and convenience. When combined with professional

expertise, these technologies create a comprehensive service ecosystem focused on long-term client experience and loyalty.

In today's beauty industry, chatbots have evolved beyond technical support tools—they now serve as full-fledged intermediaries between the client and the brand, facilitating both communication and intelligent decision-making. Thanks to AI integration, chatbots can analyze individual needs, take into account skin type, hair characteristics, and aesthetic preferences, and automatically recommend optimal solutions. This is particularly relevant for services like permanent makeup, where decisions require a high degree of awareness and customization.

Leading beauty brands such as Sephora, Estée Lauder, L'Oréal Paris, CoverGirl, and Kiehl's have implemented next-generation chatbots functioning as virtual consultants. For instance, Sephora's Virtual Assistant, developed by Assi.st, allows users on Facebook Messenger to explore products through dialogue and book appointments. This technology has led to an 11% increase in conversion rates for salon bookings compared to other channels. Meanwhile, Kiehl's uses chatbots to develop personalized skincare routines based on skin concerns, goals, and lifestyle [9].

Chatbots offer not only speed and convenience but also support informed decision-making—helping clients choose the most suitable technique, product, or procedure. This is especially valuable for those who are just becoming familiar with permanent makeup or who have limited knowledge of available techniques and aftercare. These services are further enhanced by AI diagnostic systems: for example, Vichy SkinConsult AI and Olay Skin Advisor analyze facial photos, detect wrinkles, uneven texture, and dryness, and provide tailored skincare recommendations [3].

Personalization has become a core value. Brands like Function of Beauty and Proven Skincare use AI to create custom formulations based on skin type, hair condition, lifestyle, and even regional climate factors [3]. This approach sets a new service standard—from informational consultation to confident decision-making supported by technology.

As part of the digital transformation of the client experience conducted by the author of the study, a specialized chatbot was developed and integrated into the official

website of the studio. The bot is connected to the OpenAI API and a multilingual response system tailored to the field of permanent makeup.

The chatbot includes the following functionality:

- Answers questions about procedures, the Natural Powder Brows technique, contraindications, and aftercare.
- Supports multiple languages, including English, Ukrainian, Russian, Spanish, and others.
- Provides initial consultation 24/7.
- Responds to individual queries, not just standard questions.

Thus, chatbots today not only enhance communication but also function as analytical tools that guide clients toward decisions, lower the barrier to booking services, and build trust in the brand. When combined with AI diagnostics and AR modeling, they deliver a new level of client experience in the beauty industry.

Conclusions

Innovative development in the field of permanent makeup involves not only advances in application technologies but also a digital transformation of service systems and client communication. This study demonstrates that the technical aspect of permanent makeup – particularly microblading – is a key tool in achieving high-quality aesthetic results. Technological refinement includes precise anatomical sketching, the use of ultra-fine needles, and specialized pigments that provide a natural effect and long-lasting color retention. Special attention is given to the author's technique of natural powder brows, which combines soft shading without harsh contours, high-precision pigment application, and accelerated healing without scabbing, maintaining up to 90% pigment after the first session. This method is ideal for mature skin and proves that innovations in procedure execution are just as critical as equipment.

At the same time, innovations in client experience are increasingly shaped by digital technologies. The use of AI and AR pushes the beauty field beyond the traditional salon format. AI-based systems can analyze skin condition, detect problem areas, and generate personalized recommendations for procedures and care. AR models

allow clients to virtually test outcomes, making their choices more informed. Integrating these solutions reduces uncertainty before booking, improves client awareness, and optimizes decision-making.

Equally important are chatbots, which have become essential digital consultants. They go beyond providing basic information by offering dialogue-based support, considering individual needs, helping clients book procedures, generating personalized recommendations, and increasing overall satisfaction with the brand experience. As a result, innovation in permanent makeup today is multidimensional—combining technical expertise, anatomical precision, and digital solutions to deliver a new standard of service and client communication.

References

1. Hetzler, L., & Sykes, J. (2010). The brow and forehead in periocular rejuvenation. Facial Plastic Surgery Clinics of North America, 18, 375–384. DOI: https://doi.org/10.1016/j.fsc.2010.04.002

2. Høgsberg, T., Jacobsen, N. R., Clausen, P. A., & Serup, J. (2013). Black tattoo inks induce reactive oxygen species production correlating with aggregation of pigment nanoparticles and product brand but not with the polycyclic aromatic hydrocarbon content. Experimental Dermatology, 22, 464–469. DOI: https://doi.org/10.1111/exd.12178

3. Jabraeili, D. (2025). AI in the beauty industry: Creating an intelligent and personalized future. International Journal of Modern Achievement in Science, Engineering and Technology, 2, 163–166. DOI: https://doi.org/10.63053/ijset.75

4. Mao, J., & Dejoseph, L. (2012). Latest innovations for tattoo and permanent makeup removal. Facial Plastic Surgery Clinics of North America, 20, 125–134. DOI: https://doi.org/10.1016/j.fsc.2012.02.009

5. Marwah, M. K., Kerure, A. S., & Marwah, G. S. (2021). Microblading and the science behind it. Indian Dermatology Online Journal, 12(1), 6–11. DOI: https://doi.org/10.4103/idoj.IDOJ_230_20

6. McKinsey & Company (2025). How beauty players can scale gen AI in 2025. URL: https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/how-beauty-players-can-scale-gen-ai-in-2025

7. McKinsey and Company (2023). The beauty market in 2023: A special State of Fashion report. URL: https://www.mckinsey.com/industries/retail/our-insights/the-beauty-market-in-2023-a-special-state-of-fashion-report

8. Rigney, S. (2025). Rise of chatbot technology in the beauty industry. skinmatch.com. URL: https://www.skinmatch.com/blog/rise-of-chatbot-technology-in-the-beauty-industry

9. Skinmatch (2025). Famous beauty brands using chatbot technology. URL: https://www.skinmatch.com/blog/famous-beauty-brands-using-chatbot-technology

10. TheBrowMaster.net. (2025). Introduction to permanent makeup (PMU). URL: https://thebrowmaster.net/the-future-of-permanent-makeup-latest-trends-expert-insights