2025 Capstone: Beauty's Next Frontier

Artificial Intelligence Team: Catapulting Into a New Era

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Table of Contents

I. Executive Summary: Welcome to the New World of Beauty. The Future of Beauty Is Being Rewritten by AI- And the Rewrite Has Already Begun.

Artificial intelligence (AI) is no longer an emerging technology on the horizon, but rather an embedded force already shaping the beauty industry's value chain, from product creation and consumer experience to supply chain and workforce design. This white paper, informed by more than 50 in-depth executive interviews, a proprietary national consumer survey conducted by the FIT Cosmetics and Fragrance Marketing Management AI Team, and extensive secondary research, investigates the accelerating role of AI across global sectors, including beauty, and proposes a strategic blueprint for future readiness.

According to Axios, a news website, only 35% to 40% of consumers self-identify as AI users, but over 80% interact with AI-powered systems daily without even realizing it (2025). Whether through Spotify-curated playlists, Amazon's predictive replenishment, or Ulta's AI beauty advisers, consumers are already immersed in algorithmically informed experiences. And they want more. In a proprietary national survey of over 500 respondents, 86% expressed openness to fully personalized, AI-generated beauty products, and nearly 70% were willing to exchange data privacy for greater relevance (Online National Survey, 2025; see Appendix D).

This research identifies AI not as a discrete innovation, but as a new infrastructure layer–one that will underpin everything from personalization and development to logistics and workflows. Generative AI, in particular, marks a pivotal shift from reactive automation to proactive co-creation, enabling systems that can generate, adapt, and emotionally resonate in real time. Meanwhile, the rise of agentic AI introduces autonomous decision-makers into the consumer journey, signaling the next evolution of digital interaction–from tool to teammate.

However, widespread adoption is not without risks. This paper explores the ethical, environmental, and workforce implications of AI in beauty, including challenges around bias, misinformation, sustainability, and organizational fluency. Despite 92% of companies planning to increase AI investment, only 1% report operational maturity (McKinsey, 2025). The gap is not in access; it's in application. As Nvidia CEO Jensen Huang warns, "AI won't take your job. But someone who knows how to use AI will" (J. Huang, Milken Institute Global Conference, May 7, 2025).

The beauty industry stands at a pivotal juncture. This paper argues that future market leaders will be those who treat AI not as a bolt-on capability, but as a core strategic function that keeps humanness at the center–integrating across talent, technology, and organizational culture. It presents case studies from across beauty and adjacent sectors,

showcasing how leading companies are using AI to reduce time-to-market, enhance personalization, increase operational efficiency, unlock new creative paradigms, and ultimately shift the current organizational workflows we know today.

AI is not a trend. It is a tectonic shift. And the brands that act today–with curiosity, urgency, and responsibility–will define beauty's next frontier.

II. Research Methodology

To build a multidimensional understanding of artificial intelligence's role in the beauty industry, this report employed a hybrid methodology of qualitative, quantitative, secondary, and field research approaches.

A. Qualitative Research: Executive Interviews

In-depth interviews are conducted with over 50 leaders across beauty, technology, and adjacent industries. These semi-structured conversations explore AI adoption, strategic integration, ethical concerns, and operational readiness. Executives from companies including Meta, Google, L'Oréal, e.l.f. Beauty, and Perfect Corp share insights into how AI reshapes product development, consumer experience, and organizational design.

A significant portion of each interview focuses on insights from experts within the beauty and fragrance industry. Representatives from major players, like L'Oréal's Amy Whang, Julien Chardon, and Jean Roberts; Ekta Chopra and Lakshmi Pappu from e.l.f. Beauty; Sabina Wagner, Alexis Martin, and Shannen Biserta at IFF (International Flavors & Fragrances Inc.); and DSM-Firmenich's Lauren Rooney; provide valuable perspectives on current trends and future directions. These conversations explore topics such as innovation, marketing, and the intersection of beauty and technology. Additionally, interviews with Anastasia Georgievskaya from Haut.AI, Brittany Walker and Wayne Liu from Perfect Corp, and Nicole Clay from Hue offer insights into how technology transforms beauty experiences and personalized recommendations. Sandrine Gadol from L'Oréal also contributes insights into prospective futures for the beauty sector. Finally, discussions with perfumers Shannen Biserta and Anahita Mekanik at Scentronix explore the innovative world of algorithmic perfumery and its impact on fragrance creation.

The research also draws heavily on the expertise of individuals in the technology and AI fields. Interviews with Vashisht Madhavan, formerly of Snorkel AI and Uber; Victoria Liu from Blackrock; Austin Botelho from Indeed; and representatives from Meta, including Karin Tracy; Emerson Sklar, Matt Suser and Jeff Cohen with Amazon, Kapil Dabi with Google, and Keith Boyd with Microsoft, provide crucial insights into the application of

artificial intelligence and machine learning in various contexts, including retail, finance, and consumer products. These conversations delve into how these technologies reshape consumer behavior, business operations, and the future of work. Interviews with individuals from other sectors provide a broader context for the research. Nicholas Godec from S&P Dow Jones Indices contributes insights into market trends and financial implications related to the beauty industry. Robert Masiello from Sova Labs provides perspectives on consumer insights and engagement. Andrew Videira from First Day and Kara Babb offer insights into marketing and e-commerce strategies.

Human resources insights are gathered through interviews with Laurie Leibach from L'Oréal, Kevin Stapp from e.l.f. Beauty, and Alexis Martin from IFF. These conversations focus on the impact of AI and technological advancements on the workforce, talent acquisition, and the future of work within the beauty and related industries.

The diverse range of interviewees across beauty, technology, finance, and human resources provides a robust foundation for this research. These primary sources offer a rich tapestry of perspectives, enabling a comprehensive understanding of the evolving landscape of AI.

B. Quantitative Research: National Consumer Survey

A proprietary, nationally representative survey of over 500 U.S. consumers was conducted in May 2025 by the FIT CFMM AI Team to gauge the current state of consumer understanding and acceptance of artificial intelligence in the beauty industry. This survey aimed to assess several key dimensions of consumer interaction with AI, including awareness of existing AI-powered beauty tools, levels of trust in these technologies, current adoption rates, and desired future applications. Respondents share their perceptions of and experiences with a range of AI-driven functionalities, including virtual try-on applications, AI-powered chatbots for customer service and product information, and personalized product recommendations generated by algorithms. Critically, the survey also explores consumer comfort levels with AI-driven personalization, examining the extent to which individuals are willing to share their data and preferences to receive tailored beauty advice and product suggestions. Detailed findings from this consumer survey, offering valuable insights into the evolving relationship between AI and beauty consumers, are presented in Appendix B.

C. Secondary Research: Reports and Case Review

A comprehensive review of existing literature and industry resources provided a robust foundation and broader context for this research. This review encompassed a diverse range of sources, including industry reports from leading market research firms, academic

publications exploring the intersection of AI and various sectors, market trend analyses projecting the future trajectory of AI technologies, and in-depth case studies examining real-world applications of AI in the beauty and related industries. Specifically, key sources consulted included white papers published by prominent consulting firms, offering expert insights and strategic perspectives on AI adoption; peer-reviewed research articles from reputable academic journals, contributing rigorous analysis and theoretical frameworks for understanding AI's impact; consumer behavior studies exploring the psychological and sociological factors influencing consumer adoption of new technologies; and technology forecasts anticipating the development and diffusion of AI capabilities in the coming years. This comprehensive literature review provided a rich backdrop for comparison and interpretation of the primary research findings, enabling a more nuanced and informed understanding of the evolving landscape of AI in the beauty industry.

D. Field Study: Global Emerging Markets

To assess the global applicability of AI in the beauty industry, field research was conducted in emerging and innovation-driven markets, specifically India, Sweden, and Finland. These markets were strategically selected for their unique combination of consumer readiness for technological adoption, robust digital infrastructure, and distinct cultural approaches to both AI and beauty. Comparative analysis across these diverse markets revealed significant cultural differences in AI adoption rates, innovation capacity within the beauty sector, and the specific strategies employed to build consumer trust in AI-powered experiences.

This global perspective, combined with the qualitative, quantitative, and secondary research methodologies, provides a robust foundation for understanding the current and future trajectory of AI within the beauty industry, culminating in actionable strategic recommendations for brands.

III. Introduction: The Future Is Now

This isn’t the beginning of the artificial intelligence revolution; it’s the acceleration. Beauty brands no longer have the luxury of observing from the sidelines, as tech and other industries have surpassed what was once thought possible. AI is transforming product creation, consumer engagement, operational execution, and more, rapidly redefining the industry and its possibilities for innovation. What began as digital augmentation is becoming strategic redefinition. The next generation of beauty will be shaped not by static trend cycles, but by dynamic, real-time, AI-powered consumer insight.

Across industries, AI is rapidly redefining what operational excellence looks like–streamlining workflows, accelerating innovation, and reducing time to market. From pharmaceuticals to energy to consumer packaged goods (CPG), companies are shrinking multi-year processes into months through intelligent automation and predictive analytics. For beauty brands, this signals a pivotal opportunity: Those that integrate AI not only improve speed and accuracy but also unlock entirely new capabilities that position them to compete at the pace of tomorrow's market. AI is enabling unprecedented levels of hyper-personalization, at scale.

From real-time skin diagnostics to adaptive loyalty strategies, AI is foundational to how beauty is created, personalized, and consumed. Today's leading beauty brands are not merely using AI; they are reimagining their future with it. AI is accelerating speed to market, empowering cross-functional creativity, driving sustainable innovation, and enhancing relevance across every touchpoint.

Crucially, AI is not replacing the human touch. It is amplifying it. Consumers today demand intuitive, emotionally attuned, and ethically governed interactions. To meet this demand, brands must begin by investing in people: upskilling teams, hiring AI specialists, and fostering cross-functional collaboration. Those that act with urgency and imagination will define the future of beauty. This is not a digital evolution; it is a creative revolution powered by AI. As Vidhya Srinivasan, vice president and general manager of Ads at Google, said, "If last year was about 'what is AI?,' this year is all about 'how can I use AI?'" (V. Srinivasan, personal communication, March 2025). In the past 12 months, search interest for "how to use AI" has increased 450% in the U.S. and 350% in the EU. As AI technologies improve and come into wider use, your creativity, your strategic thinking, and your ability to use these tools will be the difference maker (2024).

The evolving nature of public interest in AI is reflected in shifting search trends. In 2023, search predominantly focused on understanding the fundamental nature of AI, with search queries such as "What is AI?" In 2024, search trends demonstrated a clear shift toward practical application, with users increasingly searching for "How can I use AI?" This trend is underscored by a significant rise in search interest for the phrase "How to use AI," which surged by 450% in the United States in 2024 from the previous year. This growing desire to use AI will continue to evolve in 2025, as AI's capabilities continue to challenge how businesses fundamentally function. As AI technologies continue to advance and become more widely accessible, the ability to creatively and strategically integrate these tools will be a critical differentiator for organizations across sectors.

IV. Understanding the History of AI

A. Defining AI and Generative AI

Before exploring the historical trajectory of artificial intelligence, a clear definition is essential. Artificial intelligence (AI) refers to the capacity of machines to execute tasks that typically require human intelligence, such as learning from data, discerning patterns, and making decisions. This broad field encompasses a diverse range of techniques and technologies, from rule-based logic systems to neural networks and sophisticated deep learning algorithms. Generative AI, a more recent and prominent subfield of AI, focuses specifically on the creation of novel content, including text, images, audio, and code. Tools like ChatGPT, Midjourney, and DALL•E exemplify this generative capacity, leveraging large language models (LLMs) and neural networks to produce coherent, creative, and often remarkably human-like output (Petryszak Mudd, 2023).

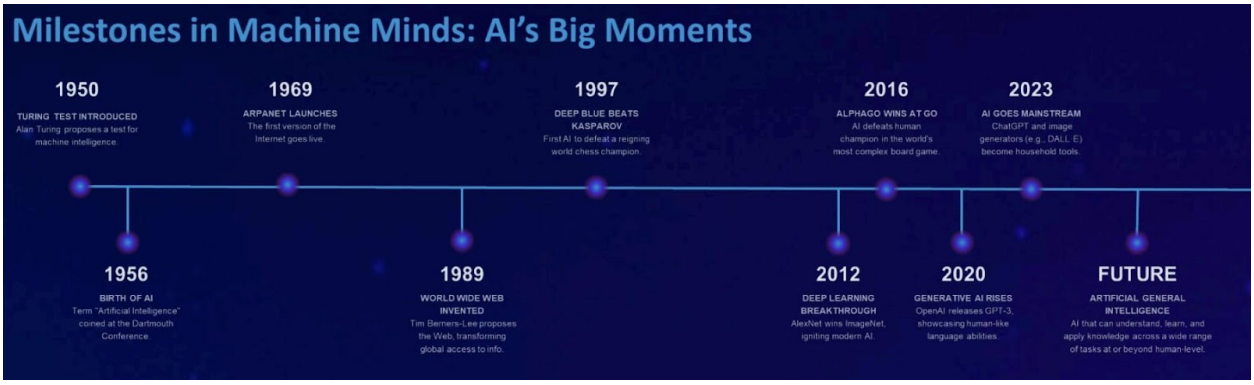

Figure 1: Milestones in Machine Minds–AI's Big Moments

Sources: AI Timeline: Stanford AI100 2016, The Economist 2024, Fox43 2025, Petryszak Mudd 2023, Axios 2025

B. The Origins of Artificial Intelligence (1950s–1980s)

The developing stages of artificial intelligence can be traced back to the Dartmouth Summer Research Project on Artificial Intelligence in 1956. This pivotal event brought together the top computer scientists, John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon to explore the then-uncharted territory of machines simulating human cognitive processes. It was during this landmark workshop that McCarthy, widely considered a founding father of the field, coined the term "artificial intelligence" to encapsulate the concept of machines capable of thought (Stanford AI100, 2016).

This initial era of AI research, spanning from the 1950s through the 1980s, witnessed a concentrated effort to develop systems capable of performing tasks typically associated

with human intellect, such as playing complex games like chess and solving intricate logic problems. These early systems primarily employed a symbolic AI approach, relying heavily on explicitly programmed rules and meticulously defined logical structures. While initial progress generated considerable enthusiasm, practical applications remained limited. These symbolic AI systems struggled to navigate the complexities of ambiguous information, nuanced situations, and the inherent variability of real-world scenarios.

Despite the initial wave of optimism, AI failed to fully realize its potential. By the mid-1970s, both government and private funding for AI research began to dwindle as projects struggled to translate theoretical advancements into commercially viable outcomes. This period of reduced investment and diminished interest is commonly referred to as the first “AI winter.” The limitations of these early AI programs became increasingly apparent; their brittle nature necessitated perfect data and idealized conditions for effective functioning, hindering their applicability in more complex and unpredictable environments (The Economist, 2024).

C. The Rise of Machine Learning (1990s–2010s)

A resurgence of interest and activity in artificial intelligence research began in the late 1990s and early 2000s. This period witnessed the rise of machine learning (ML), a paradigm shift in AI that enabled computers to learn from data without explicit programming for every possible scenario. Instead of relying on pre-defined rules, machine learning models are trained on extensive data sets to generate predictions or classifications. This data-driven approach marked a significant departure from the earlier symbolic AI paradigm. Crucially, this renewed progress in AI was facilitated by several converging factors, including a substantial increase in computing power, the growing availability of accessible digital data, and the rapid expansion of the internet (Fox43, 2025).

By the 2010s, AI had become increasingly integrated into everyday consumer experiences. Smart assistants, such as Apple's Siri (launched in 2011) and Amazon's Alexa (launched in 2014), achieved widespread adoption and became household names. AI also powered a range of other functionalities, including dynamic pricing algorithms in e-commerce, facial recognition technologies for security and authentication, and increasingly sophisticated search engine algorithms that personalize and refine search results (Fox43, 2025). This period marked a turning point in the evolution of AI, transitioning from a largely theoretical field to one with tangible, real-world applications impacting the daily lives of consumers globally.

D. The Generative AI Revolution (2020s)

The landscape of artificial intelligence underwent a dramatic transformation in the early 2020s with the advent of generative AI. Unlike preceding AI models, which primarily focused on classification and recommendation tasks, generative AI models possess the remarkable ability to create entirely new outputs. This paradigm shift was fueled by the convergence of several key factors, including the availability of massive data sets for training, significant advancements in deep learning algorithms, and the development of innovative transformer-based architectures, such as the Generative Pre-trained Transformer (GPT) models.

The release of ChatGPT by OpenAI in late 2022 marked a pivotal moment in the public awareness and adoption of generative AI. Garnering over 100 million users within mere months of its launch, ChatGPT demonstrated a substantial public appetite for AI-powered tools that are not only functional but also intuitive, creative, and readily accessible. This rapid uptake spurred the development and deployment of other powerful generative AI models, including Google's Gemini and Anthropic's Claude.

These generative AI tools empower users to create a wide range of content, from written text and code to business presentations and compelling images, all within seconds. This unprecedented accessibility has democratized access to tasks that were previously time-intensive, offering transformative potential for marketers, educators, students, developers, and other professionals (Petryszak Mudd, 2023).

The commercial trajectory of AI entered a new era in early 2024 when OpenAI filed to go public, catalyzing a surge in investment, innovation, and competitive momentum across the tech and enterprise landscape. Widely seen as a symbolic milestone, OpenAI's initial public offering (IPO) not only legitimized generative AI as a mainstream commercial force but also intensified the race among startups and incumbents to accelerate adoption and monetize AI at scale (Clark, 2024). The announcement spurred a ripple effect: from increased venture funding in agentic startups to renewed strategic pivots at firms like Google, Meta, and Microsoft. As one analyst noted, "OpenAI didn't just go public – it made AI public business" (Taylor, 2024). For the beauty industry, this moment marked a clear signal: The experimentation phase is over. The era of scaled deployment has officially begun.

By early 2025, nearly three-quarters of Americans reported using some form of AI-powered product, often without even recognizing it as such (Axios, 2025). AI has become seamlessly integrated into everyday life through tools like personalized news feeds, smart home

assistants, grammar correction software, and facial recognition unlock systems on personal devices.

E. AI in 2025: A Landscape of Disruption

In 2025, artificial intelligence has definitively transcended its role as a mere technological tool; it has become a pervasive and transformative force reshaping industries, revolutionizing workflows, and profoundly impacting daily life. The Stanford HAI AI Index Report (2025), produced by Stanford University's Institute for Human-Centered Artificial Intelligence (HAI), documents the exponential growth in both the development and adoption of AI in recent years. Private investment in AI reached a staggering $103.5 billion in 2024 alone, with significant capital concentrated in key – areas such as health care, robotics, creative content generation, and the automation of customer service interactions (HAI, 2025). Across industries, McKinsey's 2022 Global AI Survey found AI adoption more than doubled–from about 20% in 2017 to around 50% in 2022 (McKinsey Global Institute, 2022)–and McKinsey's January 2025 analysis indicates that beauty brands are increasingly embracing AI and generative-AI tools (McKinsey & Company, 2025).

Contemporary AI assistants now possess the capacity to execute a wide spectrum of complex tasks, from scheduling meetings and composing emails to translating conversations in real-time and managing extensive data sets. In customer service, AI-powered chatbots handle millions of interactions daily, providing efficient and scalable support solutions. Within the health care sector, AI contributes to enhanced diagnostics, the development of personalized treatment plans, and the acceleration of drug discovery processes. Creative industries are increasingly leveraging generative AI tools to compose music, design innovative fashion collections, and script compelling video content.

The pace of AI advancement shows no signs of slowing; in fact, it continues to accelerate. Ongoing refinements in voice activation technology, coupled with advancements in contextual memory capabilities and emotion recognition algorithms, are driving the evolution of AI toward increasingly conversational, adaptable, and remarkably lifelike interactions. From its humble beginnings at a research conference in 1956, to the billions of AI-powered interactions occurring daily in the present day, the history of artificial intelligence is a testament to the power of persistence, continuous evolution, and remarkable reinvention. What was once relegated to the realm of science fiction is now deeply interwoven into the fabric of our lives. As generative AI continues to reshape how we work, learn, and create, a deep understanding of its historical trajectory provides invaluable context for navigating its future implications and harnessing its transformative potential.

V. Beauty's Wake-Up Call: AI's Inflection Point

Artificial intelligence is not emerging–it has emerged. The beauty industry is no longer facing a distant disruption, but an immediate imperative. From Spotify-curating playlists, to Amazon anticipating household purchases, AI has already embedded itself into daily life. Yet the beauty industry is underestimating both the speed and scale of this societal transformation.

Recent data reveals a sharp disconnect: While nearly 40% of consumers believe they do not use AI, over 80% interact with AI-powered systems every day–often unknowingly (Axios, 2025). In May 2025, ChatGPT alone recorded over 5.3 billion visits globally (OpenAI, 2025). In an FIT proprietary national survey, 86% of beauty consumers expressed interest in fully personalized, AI-generated products, with 70% willing to trade some privacy for relevance (2025; see Appendix D). These are not signals of passive acceptance–they are calls to action.

Consumers are not waiting for perfect AI-integrated systems or regulatory clarity on data usage. They are already engaging with AI, often more seamlessly than with the brands that serve them. As the tools advance, so, too, do expectations. This creates a widening gap between consumer readiness and brand capability. In a space where intuition and speed matter, hesitation for AI integration is a liability.

The future of beauty will not be shaped by five-year roadmaps. It will be defined by what brands implement tomorrow. To keep up with consumer demand and ultimately be successful in today's beauty landscape, brands must do the following: build a framework for employees to engage, learn and establish AI fluency; deploy AI tools across the business and product lifecycle; and rethink business structures–while allowing humanness to remain the touchpoint of the business. The beauty companies that lead must move with urgency–learning, deploying, and future-proofing their businesses in real time.

VI. AI Today

AI has become seamlessly integrated into the pattern of daily consumer experiences, often operating subtly without conscious awareness. From personalized media recommendations to tailored shopping and customized skincare regimens, AI quietly influences decision-making and shapes personalized interactions. While consumers may not always explicitly recognize these systems as AI, their familiarity with AI-driven functionalities is demonstrably higher than commonly assumed. This pervasive presence lays the groundwork for greater consumer openness to AI-powered solutions in personal care, including beauty.

However, consumer perception hasn't fully caught up with this technological reality. In FIT's proprietary national survey, data reveals a significant disconnect: Over 70% of respondents regularly engage with AI-driven services, yet only 35% self-identify as "AI users" (Online National Survey, 2025). This discrepancy presents both a communication opportunity and an adoption challenge. AI's influence is evident in everyday applications, from personalized Spotify playlists and targeted Amazon recommendations to optimized Google Maps routes, Ulta's AI beauty advisor, Best Buy's AI gifting assistant, and Haut.AI's diagnostic engine used by retailers like Ulta and Beiersdorf (Petryszak Mudd, 2023). This widespread usage, coupled with limited consumer awareness, underscores the need for greater transparency and education regarding AI's role in shaping consumer experiences.

A. AI's Pervasive Presence

Although often discussed as futuristic, AI is deeply embedded in daily consumer interactions, powering countless micro-moments. From personalized ads on TikTok and predictive Google searches to dynamic pricing on travel websites, AI subtly shapes online experiences. In beauty, AI manifests in virtual try-on tools, skin diagnostics, and personalized product recommendations (Petryszak Mudd, 2023).

This ubiquity often goes unrecognized. A 2025 Gallup poll revealed that while only 36% of Americans believed they used AI-powered products recently, 99% reported using at least one common AI-based service when presented with examples (Gallup, 2025). Axios reported similar findings, with three-quarters of Americans regularly engaging with AI, yet only 30% to 40% recognizing this interaction (Axios, 2025). This discrepancy reveals a fundamental misunderstanding of AI. FIT's proprietary survey further supports this: While 70.33% of respondents shop at mass retailers like Walmart or Target and 52.85% shop on Amazon–retailers that embrace AI-driven personalization–only 47.94% of respondents agreed they are "very familiar" with AI, and 33.99% recognize using voice assistants as using an AI tool (Online National Survey, 2025; see Appendix D). This suggests AI's seamless integration renders it almost invisible.

B. The Awareness Gap

The awareness gap of people thinking they have not used AI when they actually do, stems from a lack of clarity around AI's definition and scope. Before the widespread adoption of generative AI in the mid-2020s, many people associated AI with science fiction, overlooking the subtle yet powerful systems driving their digital experiences. The 2025 Stanford HAI AI Index Report highlights accelerating AI adoption across sectors, with over 10,000 AI startups globally recently launched (Stanford HAI, 2025). However, these innovations often operate behind the scenes. Dynamic e-commerce platforms, for example, personalize

suggestions without explicit AI interaction, hiding the presence of AI from the consumer. This invisibility poses a branding and educational challenge. Companies often avoid labeling services as “AI-powered” due to regulatory concerns, consumer confusion, or a desire to maintain a sense of genuine personalization. Consequently, consumers underestimate AI's influence on their decisions. But as AI continues to be in the forefront of conversation, this silent approach has proved outdated.

C. Generative AI’s Impact

What sets the current moment apart from the rest of history, is the rise of generative AI, a branch of artificial intelligence focused on creating new content. Tools like ChatGPT, Gemini, and Claude have introduced the public to AI models that can write, design, brainstorm, translate, and simulate with uncanny fluency. In beauty and retail, generative AI has powered new consumer-facing tools that generate product results, customized content, and personalized shopping experiences. These experiences go beyond basic personalization; they offer proactive, context-aware engagement that mimics human interaction (Petryszak Mudd, 2023).

Importantly, these tools shift AI from a background utility to a foreground experience that enhances consumer experience. The AI is no longer hidden within systems; it is talking directly to consumers, co-creating content, and taking on roles traditionally handled by service staff, advisers, or creatives. This shift is helping close the awareness gap and increasing consumer openness to AI-led experiences.

According to FIT’s proprietary national survey, 70.2% of respondents indicated they had used some form of AI-powered technology without always realizing it, such as AI-generated recommendations on Netflix or Amazon and virtual beauty try-ons. Yet only 24.95% of respondents agreed they were “very comfortable” with AI making recommendations for them, and only 27.11% were “very comfortable” with AI analyzing their skin or hair data (Online National Survey, 2025; see Appendix D). This highlights the need for brands to use AI in a way that builds trust and familiarity.

D. Everyday Use Cases That Shape Behavior

Every day, AI subtly orchestrates consumer experiences. On the morning commute, Google Maps harnesses machine learning and aggregated location data to predict traffic conditions and guide users along the fastest, safest routes (Google, 2024). Entertainment platforms like Spotify tap into both collaborative and content-based filtering–powered by natural language processing and vast data sets–to curate personalized playlists such as Daily Mixes and Discover Weekly, shaping what millions of listeners hear each day (Spotify, 2023). In retail, Amazon’s AI-driven recommendation engine–now enhanced with

generative AI–analyzes browsing and purchase history to predict likely buys, drive shopping guides, and optimize upstream supply chains, contributing to significant gains in sales and efficiency (Amazon, 2024).

Beauty routines are likewise transformed: Ulta Beauty's AI-powered skin adviser and GlamLab use computer vision and augmented reality (AR) to scan skin tone and texture, offering customized product matches and tutorials within their apps (Ulta Beauty, 2024). And in skincare, companies like Ulta, Grupo Boticario, and Beiersdorf leverage science-first skincare like Haut.AI. Haut.AI, an AI software company, has deep-learning algorithms trained on millions of facial images to evaluate over 150 biomarkers from selfies in order to forecast skin changes over time, delivering personalized diagnostic insights and product recommendations in real time (Haut.AI, 2024). Meanwhile, Best Buy's Gift Finder and virtual assistant blend generative AI and pattern recognition to suggest thoughtful gifts and simplify customer support during peak shopping seasons (Best Buy, 2024).

These touchpoints are subtle, yet they are reshaping expectations for speed, personalization, and convenience. AI is not just offering data-driven outputs; it's tailoring entire experiences, building emotional resonance, and influencing real-world behaviors.

E. The Opportunity for the Beauty Industry

Despite this transformation, beauty brands remain in an early phase of AI integration. While some have piloted AI tools, many are just beginning to explore its full potential. According to Stanford's 2025 report, consumer retail is among the fastest-growing segments of AI, yet it remains underutilized in beauty compared with sectors like finance or health care (Stanford HAI, 2025). This reveals a stark reality: The beauty industry is failing to meet consumer expectations for relevant and personalized products.

Data from FIT's proprietary national survey underscores this opportunity: 70% of respondents shop for beauty products at retailers that already use AI, yet only 35.76% have knowingly tried an AI beauty recommendation, and just 16.50% believe those recommendations are more accurate than human advisers (Online National Survey, 2025; see Appendix D). Despite this, the demand for AI-driven solutions is clearly growing. An overwhelming 86% of respondents said they would be open to fully personalized, AI-generated beauty products. Furthermore, 68% trust AI-generated recommendations over traditional marketing claims, and 70% would consider trading some level of data privacy for a routine tailored by AI (Online National Survey, 2025; see Appendix D).

This data indicates a significant gap between consumer appetite and brand execution–a white space for forward-thinking companies to lead. The beauty industry stands at a strategic inflection point: Brands that move beyond experimentation and embed AI into the

core of their customer journey will gain a competitive edge. Opportunities abound in hyper-personalized product development, predictive skincare routines, and AI-powered consultations that adapt to lifestyle, seasonality, and evolving skin conditions.

F. A Turning Point in Everyday Intelligence

AI is now an integral part of everyday life, yet its pervasive influence remains largely unrecognized. This presents both a challenge and a once-in-a-generation opportunity, particularly for consumer-focused industries like beauty. The convergence of evolving consumer expectations, rapid technological advancements, and the increasing sophistication of AI-powered tools, especially generative AI, has created a fertile landscape for innovation but also societal disruption.

Beauty brands that proactively address the ethical considerations surrounding AI, prioritize transparency and consumer education, and strategically leverage AI's capabilities to enhance the customer journey will be best positioned not only to meet the demands of today's market but also to shape the future of beauty. The ability to seamlessly integrate AI into the core of the brand experience, while simultaneously fostering trust and empowering consumers, will be the defining characteristic of beauty leaders in the years to come.

VII. The Critical Challenges of AI

The growing use of artificial intelligence (AI) in the beauty industry offers exciting opportunities, but it also brings significant challenges that must be carefully managed. Effectively addressing these challenges is essential for brands to responsibly harness AI, maintain consumer trust, and ensure sustainable growth. These include ethical considerations, transparency, workforce readiness, sustainability, and the risks associated with misinformation. By proactively understanding and managing such challenges, brands can successfully integrate AI into their strategies.

A foundational challenge in AI is the issue of bias, primarily resulting from using data sets that lack diversity. AI systems often learn from historical data that may unintentionally reflect biases, leading them to reinforce existing stereotypes or inequalities. For instance, researchers Buolamwini and Friedman uncovered significant biases in facial recognition technology, finding that systems trained mostly on lighter-skinned individuals frequently misidentify or fail to recognize people with darker skin tones, especially women (2024). This has serious implications in practical areas like law enforcement, hiring, and security, demonstrating how biases in AI can amplify real-world inequalities.

Similarly, clinical health researchers examined biases within health care AI tools. They revealed that many health care algorithms perform poorly when diagnosing conditions in ethnic minority groups because the training data does not adequately represent these populations (Muralidharan et. al, 2024). This oversight can lead to delayed or inaccurate medical diagnoses, exacerbating health disparities. The proprietary national survey conducted by FIT CFMM found that over 60% of respondents are aware of biases in AI-driven beauty tools, and nearly a quarter have personally experienced them (2025; see Appendix D). Google's Kapil Dabi emphasizes that "responsible AI must be embedded and not just bolted on," highlighting the importance of actively working to correct biases through diverse data sets and regular algorithm audits (K. Dabi, personal communication, March 2025).

Transparency is crucial for building consumer trust in AI. Consumers increasingly demand clarity about how AI systems make decisions, the type of data used, and why certain recommendations are made. According to Dominic Paulger, clear communication about AI's workings significantly reduces consumer doubt and builds confidence (2024). The FIT CFMM proprietary national survey reinforces this, showing that approximately 75% of respondents trust brands with their beauty data and preferences (2025; see Appendix D).

Companies like Ulta Beauty provide excellent examples of transparency by openly communicating their use of AI-driven recommendations, demonstrating how clear disclosures build stronger customer relationships. Thus, transparency in AI is not just an ethical requirement but also a strategic advantage that strengthens consumer loyalty and trust.

Integrating AI into business operations also significantly impacts employees. AI can greatly enhance productivity, creativity, and operational efficiency, but it can also create concerns around job security and the need for new skills. Meta's research highlights that only about one-third of employees have had formal training in AI, indicating a substantial skills gap that needs urgent attention (2023). As discussed in this white paper, the first and crucial step toward AI literacy and business implementation is education.

Qualitative insights from industry leaders underline the importance of preparing employees to work effectively alongside AI. Google's Kapil Dabi emphasizes that businesses must focus not just on their AI strategy but on how AI aligns with their overall business goals (K. Dabi, personal communication, March 2025). Therefore, comprehensive training programs that teach employees how to effectively utilize AI tools and collaborate with technology are essential for maximizing AI's benefits and minimizing workforce disruptions.

The environmental impacts of AI represent another major concern.

Training large AI models requires substantial computational resources, resulting in significant energy consumption and increased carbon emissions. According to the Stanford HAI AI Index Report, if current trends continue, AI-related energy use could account for up to 20% of global electricity consumption by 2030 (2024). This highlights the urgency for adopting sustainable practices within AI development.

Leading tech companies like Google and Meta have set strong examples by incorporating renewable energy and energy-efficient technologies into their data centers (Ascierto, 2018; EPA, 2018). Beauty brands must similarly prioritize sustainability by investing in greener, more efficient AI solutions. Embracing sustainability is increasingly a consumer expectation and vital for long-term brand reputation.

AI-generated misinformation, particularly deepfakes, poses a significant risk to consumer trust and brand integrity. Misinformation can quickly damage consumer confidence, especially when deceptive marketing or misleading content is involved (Salvagno et al. 2023). AI-generated content can convincingly mimic authentic sources, making it crucial to maintain strong oversight and clear guidelines for accuracy and honesty. The FIT CFMM national proprietary survey shows that almost half of consumers view AI-driven recommendations as equal to or better than those from humans (2025; see Appendix D). This places even greater importance on having strict controls, careful oversight, and verification procedures to ensure the accuracy and authenticity of AI-produced communications.

Navigating these diverse challenges requires a unified, proactive approach. Brands must establish strong ethical frameworks, implement clear transparency guidelines, offer comprehensive workforce training programs, adopt sustainable practices, and develop robust strategies to manage misinformation. Thoughtful attention to these areas enables businesses to effectively leverage AI, fostering enduring consumer trust and loyalty. Brands that integrate AI responsibly and prioritize consumer interests will be positioned to lead the industry toward sustainable innovation. As Google's market lead for retail and consumer states, "Narrative is not 'what is your AI strategy,' it's 'what is your business strategy'" (K. Dabi, personal communication, March 2025). Responsible AI must be seamlessly integrated within a brand's core identity rather than treated as an afterthought.

VIII. The Driving Force: Consumer Demand

AI in beauty is not just driven by possibility, but it is also propelled by consumer expectations. From Netflix and Spotify to TikTok and Amazon, consumers have grown

accustomed to personalized, on-demand, intuitive experiences. The same standards are now applied to beauty. Artificial intelligence's growing role in the beauty industry is significantly influenced by evolving consumer expectations, shaped largely by experiences across various personalized, responsive, and interactive digital platforms. Consumers now expect similar levels of tailored experiences in all their interactions, placing new demands on beauty brands to deliver personalized, immediate, and engaging products and services.

Consumers have been at the forefront of driving AI's adoption in their daily lives, reflected clearly in platforms such as Netflix, Spotify, Amazon, and TikTok. As previously stated in this paper, the FIT CFMM proprietary national survey highlighted this consumer trend, revealing that an overwhelming 86% of respondents expressed interest in fully personalized beauty products created by AI, with nearly 40% enthusiastically supporting this concept (2025; see Appendix D). Additionally, the survey indicated that approximately 70% of respondents purchase beauty or personal care products weekly or monthly (2025; see Appendix D), highlighting frequent opportunities for brands to leverage AI-driven personalization.

Netflix, a leader in AI-driven personalization, utilizes sophisticated algorithms to analyze extensive viewing histories, user preferences, interactions, and ratings. These analyses generate highly targeted content recommendations, significantly boosting viewer engagement, satisfaction, and retention by consistently matching viewer interests.

Spotify similarly demonstrates the power of AI in personalization.

Spotify's AI analyzes listening habits, emotional states, and user interactions to deliver timely and mood-specific playlists, such as "Discover Weekly" and "Release Radar." Approximately 60% of Spotify's streams come from these personalized, algorithmically generated recommendations. Remarkably, as of January 2025, Spotify reported nearly 2 billion daily music discoveries across personalized hubs, highlighting strong consumer demand for AI-driven personalized experiences (Kumar, 2025).

Amazon further illustrates the potential of AI personalization through its predictive shopping algorithms. By leveraging vast amounts of consumer data, including previous purchases and browsing history, Amazon proactively anticipates consumer preferences, offering timely and relevant product suggestions. This predictive approach greatly streamlines the shopping experience, enhancing customer satisfaction and fostering stronger consumer loyalty.

TikTok has also successfully harnessed AI to deliver personalized experiences at scale. TikTok's algorithm rapidly analyzes user interactions, viewing patterns, and content preferences to curate personalized video feeds. This highly individualized content delivery

is central to TikTok's global popularity, as it captures user attention and maintains high engagement levels by consistently matching user preferences with content.

Modern consumers prefer to be directly involved in creating or customizing the products they use, whether they know they are doing so or not. They want to actively influence decisions, personalizing products to their specific needs and participate in the overall experience rather than passively receiving what brands provide without input. For example, when a consumer likes a song on Spotify, they are effectively training the AI in the platform to know their preferences, making it more effective in suggesting songs the user will like in the future.

Companies like Starbucks and Nike effectively leverage AI to actively involve consumers in their products and marketing strategies. Starbucks employs AI-powered apps to provide personalized product recommendations and incentives based on buying patterns, while Nike utilizes platforms like Nike By You, enabling consumers to actively participate in product customization.

This extends further into the beauty industry as well. The FIT CFMM national proprietary survey reveals that approximately 76% of consumers would willingly exchange some degree of privacy for personalized, AI-driven beauty routines and products. In addition, 45% of consumers expressed comfort with AI automatically repurchasing beauty products for them, particularly fragrances and cosmetics, highlighting consumer willingness to trust AI with recurring purchasing decisions (2025; see Appendix D).

This desire for active participation in shaping personalized experiences presents significant opportunities for beauty brands to engage consumers on a deeper level. L'Oréal, for example, has pioneered personalized beauty through AI-driven platforms such as Perso, which creates customized skincare and cosmetic products tailored to individual consumer preferences (L'Oréal, 2020). Additionally, Revieve notes how balancing personalization and data privacy is crucial for brands aiming to build consumer trust, as clear communication about data usage is increasingly demanded by consumers (Revieve, 2022).

Further exemplifying innovation in AI-driven beauty customization, Osmo, the first AI-powered fragrance house, has introduced Generation Osmo, an AI-powered platform designed to personalize fragrances by interpreting individual emotional profiles and preferences. By capturing emotional nuances and translating them into tailored scent experiences, Osmo leverages advanced algorithms to ensure fragrance choices resonate deeply on a personal and emotional level, reflecting consumers' evolving desire for highly individualized products and experiences (Premium Beauty News, 2023).

Transparency around AI processes becomes not only a consumer expectation but also a foundational element of trust and loyalty in the beauty sector. Consumers expect clear communication regarding data usage and AI-driven decision-making processes. Approximately 75% of survey respondents in FIT's proprietary national survey indicated that transparency regarding how brands use AI, including detailed explanations of formulation and testing processes, would increase their trust or potentially influence their trust positively in AI-generated products. Additionally, approximately 47% of consumers perceive AI-generated beauty recommendations as equally or more accurate than human-provided recommendations, reflecting growing consumer confidence in AI's efficacy (Online National Survey, 2025; see Appendix D).

Ultimately, many successful brands use AI to empower and enhance consumer journeys rather than controlling or merely automating them. Consumers increasingly favor brands that prioritize personalization, immediacy, active engagement, and transparency. Successful brands view AI as complementary to human interaction, using technology to enrich and deepen consumer experiences and connections. By meeting consumer expectations in these critical areas, brands can effectively leverage AI to build sustained trust, loyalty, and deeper relationships.

Consumer expectations significantly influence AI's integration within the beauty industry, driving brands toward personalized, immediate, interactive, and transparent experiences. Additionally, as nearly 62% of consumers recognize biases within AI beauty tools, responsible and inclusive AI practices become essential. Ultimately, brands that leverage AI to enhance rather than control consumer journeys will secure lasting trust and loyalty (Online National Survey, 2025; see Appendix D).

IX. How AI Is Driving Efficiency Across Global Industries

In today's landscape, artificial intelligence (AI) is no longer reserved for sci-fi enthusiasts or Silicon Valley labs. It is transitioning from a buzzword to a backbone across industries. The technologies that once seemed abstract–machine learning, generative algorithms, and natural language processing–are now silently shaping how brands operate, produce, and communicate. AI is being used not only as a functional tool but also as a strategic pillar of operational efficiency. The companies described in the following section are defining what it means to be best-in-class by leveraging AI as their competitive differentiator, enabling these businesses to operate faster, more innovatively, and more efficiently, thereby meeting consumer needs and maintaining a robust bottom line.

A. Automotive: Intelligent Design and Predictive Performance

In the automotive space, AI has become synonymous with a forward-thinking identity. Tesla, for instance, does not just use AI; it is built around it. Their full self-driving systems rely on neural networks and reinforcement learning, with data collected from a fleet of vehicles used to train their models continuously. Their predictive maintenance system has reduced emergency repairs by 30%, demonstrating the tangible impact of AI on safety and efficiency (Tesla, 2025). That ethos of an innovative, scalable, ever-improving mindset has become a branding statement, not just a feature.

This evolution is not unique to Tesla. General Motors has leveraged its identity as a design-forward manufacturer by partnering with Autodesk, a design and software company, to integrate generative AI into its engineering processes. A single AI-designed seatbelt bracket became 40% lighter and 20% stronger, consolidating eight parts into a single component. That is not just a cost savings; it is a reinforcement of GM's identity as an innovator in smart manufacturing (Danon, 2018; Tesla, 2025). Similarly, Finnish startup Basemark overlays driving environments with RockSolid AR, an AI-powered augmented reality system that anchors heads-up-display content despite vehicle movement, improving driver awareness and safety (Tesla, 2025).

B. Pharmaceuticals: Accelerating Drug Discovery and Development

This pattern of efficiency continues into pharmaceutical development, where AI-driven speed, accuracy, and foresight are the new gold standards. Pfizer has begun using AI to identify viable drug candidates, reducing development time by 70%–from an industry average of 4.5 years to just 12–15 months (Tesla, 2025; Pfizer, 2025). It is a significant shift from reactive to proactive pharma, and the brand benefits are clear: faster time to market, reduced cost, and positioning as a tech-forward leader.

For Exscientia, a biotechnology company pioneering the use of AI to design and develop new drugs, the transformation is even more pronounced. Their Centaur AI platform not only aids discovery but also redefines it. By generating highly optimized molecules that meet multiple pharmacology criteria and accelerating the compound qualification process, Exscientia has matched Pfizer's accelerated timelines, becoming synonymous with efficiency and intelligent biotech (UKRI, 2023). In 2025, Exscientia made headlines with DSP-0038, one of the first AI-designed drugs to enter clinical trials to treat Alzheimer's psychosis (Medpath, 2025).

C. Retail and CPG: Consumer-First, Data-Driven Efficiency

In retail, brands are learning that AI is not just for backend logistics–it can be the face of the consumer experience. Amazon's Interests feature lets customers use natural language to

describe their preferences. AI takes over from there, scanning Amazon's entire inventory, alerting customers to new finds and making highly personalized recommendations. The experience is intuitive, efficient, and persistently evolving–an embodiment of a modern, responsive operation (Lloyd, 2025).

Even in consumer-packaged goods (CPG), where innovation often moves slowly, AI is becoming a core strategy. Mondelēz International, the parent company of Oreo and other iconic snacks, is utilizing AI to design flavor profiles that take into account aroma, taste, and nutritional impact. The AI does not stop at recipes; it optimizes cost, environmental impact, and production logistics. This shift has made the company's innovation process two to five times faster, cutting the time to trial from months to mere weeks (Morris, 2024).

D. Creative Industries: Amplifying Human Imagination

In the creative industries, AI is not replacing creators; it is empowering them to do their jobs more effectively. Visual effects artist Evan Halleck used Runway tools on the movie *Everything Everywhere All at Once* to remove backgrounds, enhance shots, and compress weeks of work into minutes. The film went on to win Oscars, and the story behind its production reinforced the narrative of AI not as cold machinery, but as an accelerator for imagination and cost reduction (Tangcay, 2023).

E. Digital Interaction and Gaming: Scaling Communication and Creation

AI is also redefining how people interact with digital platforms. NVIDIA's ACE platform creates digital humans that can perceive, speak, and emote realistically. Integrated into gaming, health care, and customer service, these avatars become brand ambassadors that can interact naturally with users.

They represent a shift in operations–enhancing communication and scaling human interaction efficiently (NVIDIA, 2025). The online gaming platform, Roblox, extends this idea by democratizing digital creation. Its Mesh Generator API uses a 1.8 billion-parameter model to turn simple text prompts into intricate 3D objects. This not only accelerates content development but also broadens the scope of who can participate in creating digital experiences, reinforcing the platform's efficiency-first approach (Fried, 2025).

Razer, another gaming company, is taking a different angle–performance assurance. Their Wyvrn QA Copilot utilizes AI to identify bugs and glitches during game development, reducing quality assurance (QA) time by half and detecting 20% 25% more bugs than manual testers. This ensures smoother launches and strengthens Razer's image as a high-performance, quality-obsessed brand (Di Benedetto, 2025).

In all these cases, AI does more than optimize. It enhances precision, compresses timelines, and reduces costs. These companies are building systems not around what AI might do in the future but what it already delivers: unmatched operational efficiency.

X. AI-Powered Personalization: The Shift from Mass Marketing to Individual Connection

In the beauty industry, artificial intelligence (AI) is rapidly transitioning from a novel tool to a foundational element of a more agile, efficient, and consumer-centric business model. AI's transformative power is particularly evident in the realm of personalization, which has evolved from a marketing afterthought to a critical differentiator in today's competitive landscape. This shift marks a move away from generic, one-size-fits-all approaches toward dynamic, real-time dialogues between brands and individual consumers. AI empowers beauty companies to engage with singular identities, leveraging data, emotion, and context to craft uniquely personal experiences.

Personalization is no longer simply about accommodating stated preferences; it is about delivering precision, anticipating needs, and fostering deeper connections with consumers.

A. From Segmentation to Micro-Targeting

Traditional personalization models were limited in scope and scale, relying on static demographic data and rudimentary segmentation. Consumers often received generic messaging based on broad categories like age or gender, neglecting the nuances of individual preferences and the fluidity of identity, which shifts with time, context, and mood.

AI-enhanced personalization transcends these limitations. Leveraging machine learning, natural language processing, and predictive analytics, AI analyzes vast, multidimensional data sets (including demographic, behavioral, psychographic, biometric, and environmental data) to detect patterns, anticipate needs, and adapt interactions in real time. Algorithms like collaborative filtering, content-based filtering, and deep learning models enable this shift. This represents a fundamental change from reactive segmentation to proactive micro-targeting. Consumers are no longer passive recipients of information; they are active participants in a personalized ecosystem. With 71% of consumers expecting individualized interactions and 76% expressing frustration when these expectations are unmet (McKinsey, 2025b), AI-powered personalization is essential for competitive viability. This approach allows brands to create dynamic consumer profiles that evolve with each interaction, incorporating contextual awareness and emotional

sensitivity. AI facilitates personalized messaging that considers not only what is communicated but also when and how, adapting tone and recommendations based on individual sentiment, lifestyle, and even environmental factors, fostering deeper resonance and connection.

B. AI-Driven Personalization in Practice

This transformative potential is already evident across diverse consumer touchpoints. Google, for example, leverages AI to deliver tailored search results and predictive suggestions based on individual behaviors, devices, and locations. Google Discover anticipates user interests, surfacing relevant content proactively (Deepdub, n.d.). In beauty, this predictive capacity foreshadows a future where product recommendations consider not only past purchases but also biometrics, seasonality, and emotional state. Netflix demonstrates the power of micro-targeting by dynamically selecting thumbnails based on viewer history and preferences, personalizing both content recommendations and visual presentation (University of Strasbourg, 2024). This behavioral design approach has significant implications for beauty user experience (UX), suggesting a future where tutorials, visuals, and promotions are customized to individual aesthetic sensibilities.

C. Conversational Commerce and Personalized Experiences

The emergence of AI-powered conversational agents adds another dimension to consumer engagement. Amazon's Rufus, for example, processes millions of daily queries using natural language, enabling personalized product suggestions based on purchase history, reviews, and community data (Rozencwajg, 2025). AI is no longer just answering questions; it is intuitively guiding decisions. Spotify's AI DJ curates personalized playlists with voice-guided commentary that evolves over time (Peters, 2023), demonstrating the potential for AI-powered consultations or adaptive beauty rituals. Starbucks' Deep Brew platform uses AI to drive loyalty through hyper-personalized promotions based on transaction history, location, and weather patterns (Gordon, 2024). In beauty, this could translate to contextually relevant product recommendations, such as a hydrating mist before a hot commute or a calming toner after travel.

D. Personalization Across the Value Chain

Osmo, the world's first AI-powered fragrance house, exemplifies the convergence of personalization and product creation. Its generative platform, Forge, designs fragrance molecules tailored to individual emotions and memories, accelerating development cycles fourfold (Osmo, 2025). This signifies a shift from mass-produced products to those designed with individual context and emotional resonance in mind.

Similarly, IFF's ImagenAI leverages consumer sentiment to build mood boards that inspire new scents and directly influence the creation process.

The AI interprets emotional responses and imagery from consumer feedback, guiding perfumers and developers with cultural and emotional intelligence. It transforms development from artisanal to insight-driven, translating abstract feelings into product direction (Biserta, S., personal communication, March 2025).

Beauty retailers are also leveraging AI to build trust. Sephora's Skincare IQ and Virtual Artist tools use biometric data and augmented reality to personalize skincare routines and shade matches, improving conversion rates and reducing returns (Parkkinen, 2024). Ulta's predictive loyalty engine recommends personalized offers and skincare nudges, increasing retention (Barba, 2024).

E. Cross-Industry Inspiration and the Future of Beauty Personalization

AI personalization is being integrated into broader ecosystems across industries. Samsung's AI-powered refrigerators offer dietary suggestions based on consumption habits, suggesting future beauty tech applications like smart mirrors that recommend skincare based on climate or hydration levels. Wayfair's visual search AI allows users to upload images for personalized décor suggestions, hinting at a future where consumers upload selfies for tailored makeup or fragrance recommendations (Bhattacharya, n.d.). Nike's personalized app, Nike Fit, uses computer vision for shoe size recommendations, demonstrating a similar potential for revolutionizing beauty shade matching (Bhattacharya, n.d.). Snickers' AI-driven, culturally tailored advertising campaigns (One Club, 2024) and H&M's AI-powered chatbots for outfit suggestions and purchases (Baek, 2025) further illustrate the potential for adaptive storytelling and seamless integration of inspiration and action in the beauty space.

AI-powered personalization amplifies the human touch in beauty, moving beyond transactional relevance to emotional resonance. AI enables brands to understand not just who the consumer is but also how they feel and what they want. This understanding allows for contextual, continuous, and uniquely human interactions. This deeper understanding requires careful consideration of ethical implications, such as data privacy, and the potential for overly intrusive personalization. Maintaining the human touch remains crucial, ensuring a balance between AI-driven recommendations and human expertise.

The challenge for beauty brands is not whether to personalize, but *how* to personalize with relevant and intuitive data points. Winning brands will treat personalization as a consumer philosophy–infusing AI throughout the experience ultimately personalizing beauty itself. By striking a balance between technological advancement and ethical considerations, beauty

brands can unlock the true potential of AI-powered personalization, creating deeper connections with consumers and driving meaningful engagement in the years to come.

XI. Agentic AI: From Tool to Teammate

As artificial intelligence evolves, AI agents are emerging as the next major shift, marking a seismic evolution in how technology operates. Unlike traditional AI models that react to single prompts or tasks, AI agents act proactively. They are designed to autonomously execute complex activities, make decisions, and learn over time without constant human intervention. Unlike static tools, AI agents are goal-driven, adaptive, and capable of operating independently, without human intervention. They can perceive their environment, remember user preferences, make decisions, and act–often anticipating needs before a consumer even articulates them. By interpreting real-time environmental data, emotional cues, and behavioral signals, AI agents create dynamic, highly personalized experiences.

This evolution represents a significant leap forward. AI agents are not just tools–they are collaborators. They combine perception, reasoning, and action, and they often coordinate with other agents or systems to solve complex, multi-step problems. Unlike AI that waits for instructions, agentic systems self-initiate, reason across multiple steps, and determine the best course of action without waiting for human input.

Adoption is already accelerating. In PwC's 2025 survey of U.S. executives, 79% said they are already using AI agents, with 88% planning to increase their AI budgets because of them. Among current adopters, 66% reported measurable productivity gains (2025). Outside of beauty, other industries are quickly embracing AI agents. In health care, agents triage patient symptoms, analyze scans, and match patients to clinical trials in real time. In finance, autonomous trading bots analyze market data, execute trades, and adjust strategies without human intervention, while JPMorgan's COIN agent reviews complex legal documents in seconds. In retail, companies like Walmart use AI agents to dynamically manage inventory, predict demand, and optimize the supply chain. In education, AI tutors personalize learning paths and adapt lessons in real time, as seen in Duolingo's AI-powered language platform.

Multi-agent systems take this further, involving multiple AI agents working collaboratively or competitively within a shared environment. These systems allow agents with different roles, goals, and information to coordinate and solve complex, interconnected problems that a single agent could not handle alone. In industries like logistics, finance, and gaming, multi-agent systems are already optimizing operations, coordinating supply chains, and

simulating large-scale interactions. Looking ahead, agent-to-agent marketing is poised to transform commerce. In this model, AI agents acting on behalf of consumers and brands will interact directly, facilitating transactions, negotiating prices, and personalizing marketing efforts at scale. A consumer's AI agent will understand their preferences, history, and needs, while a brand's agent will manage real-time product information, promotions, and inventory. These exchanges will happen autonomously, creating hyper-personalized, seamless experiences without direct human input at every step.

In the beauty industry, AI agents will be able to personalize product recommendations at scale, predict consumer trends based on live data, and deliver more human-like customer service experiences. More advanced agents could manage inventory forecasts, optimize marketing campaigns, and even assist beauty advisors with real-time, tailored insights. AI agents represent an opportunity for brands to move beyond static personalization toward adaptive, real-time, and proactive interactions. Imagine an AI agent that understands a consumer's skin tone, purchase history, and skincare goals–proactively recommending products, matching shades, or even forecasting the next big ingredient trend. These agents will streamline operations, optimize supply chains and fuel innovation, and create deeper customer loyalty. Early investment in AI agent frameworks will be critical for beauty companies that want to lead in this next era.

According to a recent Salesforce study surveying global human resources executives, agentic AI is projected to grow 327% over the next two years (2025). However, the study also revealed that, currently, only 15% of organizations have fully embraced agentic AI, and 73% of employees say they are unaware of its potential (Salesforce, 2025). Companies that give employees the tools and resources toward education, while simultaneously integrating AI agents, will be poised to deliver faster, smarter, and more intuitive experiences, thus setting new standards for consumer expectations. For enterprises overall, this is more than a technology shift; it is a shift in leadership, requiring new ways of thinking about decision-making, collaboration, and how value is created in an AI-driven world. Ultimately, agentic AI represents not just a technological revolution but also a leadership one.

The creative futures trend forecasting agency Future Snoops has launched a conversational AI agent built around their "Creative Unflattening" philosophy, focused on helping brands explore new product ideas and spot opportunities to make their work more distinctive. Instead of holding all of the answers, the AI asks thoughtful and provocative questions to guide users in deepening and surfacing their own understanding of what their brand needs, helping them break free from algorithmic sameness.

This is the future of business and consumer engagement–not through apps and interfaces but through intelligent relationships with AI agents. Beauty brands must evolve accordingly. When agents become the new interface, every aspect of the customer journey–from discovery to purchase to loyalty–will need to be reimagined for agent-led ecosystems. AI agents will not just change how consumers shop; they will redefine how brands are built.

XII. AI in Action: Who's Already Building the Future

While some brands are still building their AI strategies, others are sprinting. The following examples showcase companies across industries deploying AI not as a concept but as a capability–demonstrating sharper speed, smarter systems, and scalable personalization.

- **Mondelēz**: Mondelēz International, the parent company of Oreo, harnessed generative AI to reimagine its innovation process. By using machine learning to model flavor preferences and simulate formulation outcomes, Mondelēz developed over 70 product concepts in a fraction of the traditional time. This reduction in development cycle time not only boosted internal efficiency but also allowed the company to test and iterate more quickly in-market– a crucial strategic advantage in an increasingly trend-sensitive CPG space (Morris, 2024).
- **Helen**: Helen, Finland's largest energy provider, built a real-time, AI-powered digital twin of its district heating infrastructure. This system models and predicts energy demand, identifies inefficiencies, and dynamically rebalances energy loads, enabling Helen to cut its coal usage by 60%. Beyond operational savings, the implementation supported Helen's broader carbon neutrality goals, illustrating how AI can simultaneously drive sustainability and performance (Helen, 2025).
- **Pano AI**: Pano AI uses AI-powered, high-resolution cameras and machine learning models to detect wildfires at their earliest stages. Currently deployed across the United States and Australia, the system has already detected thousands of fire incidents in real time (Pano, 2025). For beauty and wellness companies operating in climate-sensitive supply chains, Pano AI underscores how real-time environmental intelligence can become a risk-mitigation asset.
- **Exscientia**: A biotechnology company pioneering the use of AI to design and develop new drugs, Exscientia made headlines with DSP-0038, one of the first AI-designed drugs to enter clinical trials to treat Alzheimer's psychosis (Medpath, 2025). Their Centaur AI platform not only aids discovery but also redefines it. By generating highly optimized molecules that meet multiple pharmacology criteria and accelerating the compound qualification process, Exscientia has matched

Pfizer's accelerated timelines, becoming synonymous with efficiency and intelligent biotech (UKRI, 2023).

- **Spangle**: Spangle is an AI-native e-commerce platform that delivers radical personalization. Its technology dynamically rewrites landing pages based on individual shopper behavior – tailoring layout, messaging, and images in real time. This shift from static design to fluid adaptation resulted in a 51% increase in conversions (Spangle, 2025). For beauty retailers, Spangle represents the evolution from personalization to participation – where every digital touchpoint responds to the consumer's unique intent.
- **Visa**: Visa is piloting a first-of-its-kind initiative enabling AI agents – powered by platforms like OpenAI and Anthropic – to make autonomous, budget-constrained purchases on behalf of users. This test marks a new frontier in consumer trust, blending payment infrastructure with agentic autonomy (Visa, 2025). For beauty brands, this suggests a future where AI not only recommends products but also completes the transaction–hands-free and frictionless.
- **ThriveAI**: ThriveAI, founded by former Google and Palantir engineers, has developed agents that operate as junior product managers. These agents integrate into communication tools like Slack and Microsoft Teams, constantly synthesizing product feedback, tracking competitor launches, and surfacing actionable insights (Thrive, 2025). ThriveAI illustrates how AI can support creative development by taking over analytical synthesis–freeing human teams to think more strategically.

These aren't experiments–they're strategic blueprints. The companies deploying AI today are not just operationally optimized; they are redefining what organizational agility, creativity, and consumer relevance look like in the AI era. The question is no longer, "Should we build with AI?" It's, "Why aren't we already?"

XIII. Designed to Adapt: Future-Proofing Your Organization

AI is not just another technology wave; it is fundamentally reshaping how work is done. As automation and intelligent systems take over routine tasks, the value of human work will increasingly shift toward judgment, creativity, and strategic decision-making. To stay competitive, companies must ensure their teams evolve alongside these technologies.

One of the biggest challenges businesses face today is the skills gap. While AI capabilities are growing exponentially, workforce skills are not keeping pace. According to the World Economic Forum, 44% of workers' core skills are expected to change by 2027 (2023). Companies that do not invest in upskilling risk falling behind, not because they lack access to technology but because they lack people who know how to apply it effectively.

AI adoption without human capability leads to underperformance. A Deloitte study found that companies investing heavily in both AI and employee upskilling achieve nearly double the return on their AI investments compared with companies that focus only on technology (2024). While some jobs and skills are replaced with automation, the overall sentiment remains: Technology amplifies human skills; it does not replace them. Additionally, upskilling boosts employee engagement and retention. Workers who are given opportunities to grow are more likely to stay, and companies with robust development programs are 2.9 times more likely to outperform their peers in innovation and productivity (Deloitte, 2023).

Even as the promise of AI becomes clearer, one reality remains: Most companies are not prepared for what is coming. According to McKinsey & Company, 92% of companies plan to increase AI investment over the next three years, yet only 1% currently feel they are AI-mature across their operations (2025c). It is not just systems that need an upgrade; it is skill sets. Today, only 31% of employees are trained in AI, but 77% expect AI to significantly impact their work within the next three to five years (McKinsey & Company, 2025c). This reflects a massive fluency gap and signals that education, not technology, is the true bottleneck.

As Jensen Huang, CEO of NVIDIA, puts it: “AI won’t take your job. But someone who knows how to use AI will” (J. Huang, Milken Institute Global Conference, May 7, 2025). The message is clear: Upskilling is not optional or a nice-to-have; it will become a company’s competitive edge. To succeed in this new landscape, teams will need an updated toolkit. AI literacy–a deep understanding of how AI works, what it can and cannot do, and where it fits into the business–will be critical. Employees must learn to identify the right problems AI can solve. Prompt engineering will become a key skill, enabling employees to communicate with AI tools clearly and strategically to generate high-quality outputs. Data fluency will also be essential; not everyone needs to be a data scientist, but everyone should be able to interpret data and use insights to inform decisions. Agent management, the ability to deploy, oversee, and collaborate with AI agents across workflows, will help companies coordinate autonomous tools toward shared goals and ensure measurable outcomes. Finally, digital judgment will be crucial, teaching teams to know when to rely on AI and when to lean on human instinct.

As Ekta Chopra, chief digital officer of e.l.f. Beauty, said: “In the AI era, talent is still your greatest differentiator–but only if it is future-ready.” Transformation will not happen with technology alone. The key is treating AI adoption as an organizational learning challenge. Companies must rethink fundamental assumptions about how work gets done and leverage their experts, the people doing the work, to drive innovation. People are, and will

always be, the key to sustainable success when they are empowered, equipped, and inspired to lead change.

According to a 2025 McKinsey & Company study, employees are three times more likely to be using generative AI today than their leaders expect. Only 4% of C-suite respondents estimate that employees are currently using generative AI for more than 30% of their daily tasks (McKinsey & Company, 2025a). International employees are ahead; 84% report receiving significant or full organizational support to learn AI skills, compared with just over half of U.S. employees (McKinsey & Company, 2025a). International employees also report greater participation in developing generative AI tools at work, including activities such as providing feedback, beta testing, and requesting specific features, with a difference of at least 10 percentage points compared with U.S. counterparts.

As AI continues to reshape industries and redefine how work is done, companies face a clear mandate: upskill their teams or risk falling behind. Technology alone will not drive transformation; people will. Organizations must equip their workforce with the skills to collaborate with AI, navigate new tools, and make strategic decisions in a digital-first world. Upskilling is not just an investment in technology adoption; it is an investment in future-proofing talent and ensuring long-term competitive advantage. Recommendations:

Start small, but build boldly: In the age of AI, hesitation is the real risk.

Start slow, but start today. Crawl, walk, run–just move forward. Adapt fast or fall behind. This is about embracing experimentation over perfection, recognizing that innovation rarely comes from waiting for the “right” moment. The right moment is now.

Be curious: A mindset of curiosity leads directly to innovation. The real question is: Do we want AI to happen *to* us or *with* us? If we do not embrace this new path forward, it will happen to us. Start small, but think boldly. Test one focused use case, but do it with scale in mind. In this new era, it is not about having all the right answers—it is about learning to ask the right questions.

Keep it human: As you integrate AI into your workflows, integrate humans into the AI. Humans provide critical input, feedback, and oversight, ensuring that AI aligns with human judgment, ethics, and goals.

This makes AI more reliable and trustworthy. Success with AI is not about replacing people; it is about empowering them. AI can never replicate taste, empathy, or intuition. The future is not AI instead of people–it is AI with people at the center. Invest in people, not just platforms.

Train for tomorrow: AI adoption will not succeed if it is pushed down from the ivory tower. To be successful, it must be embraced at every level, across every function. Build a culture of continuous learning. Create internal AI champions who lead by example. Launch rapid upskilling sprints to spark momentum now. The future belongs to teams that evolve faster than the technology around them.

A. The Future of Work: The AI Organizational Chart

The age of agentic AI requires more than new tools–it requires new teams. As AI systems evolve from assistants to collaborators, the organizational structure must evolve with them. Beauty brands must reimagine team design, workflows, and performance measurement to stay relevant in an AI-powered landscape.

Meet the New Organizational Chart:

- Agent Ops Manager: Orchestrates multiple AI agents across the business, managing workflows, performance, and ethical guardrails.
- AI Project Manager: Translates strategic goals into AI-executable prompts and outputs, working alongside agents to deliver against Key Performance Indicators.
- Prompt Strategist: Specializes in crafting the language, structure, and logic required to optimize AI outputs across creative, technical, and operational contexts.

New Metrics for Success:

- Hours saved
- Speed to insight
- AI-powered Return on Investment
- Accuracy of autonomous decisions

These roles won't replace traditional functions–they'll enhance them. The future of work in beauty will be hybrid: human intuition paired with machine precision. Brands that build for this now will be faster, smarter, and freer to think bigger.

XIV. Conclusion

The transformative impact of AI in the beauty industry is undeniable, representing a paradigm shift that reshapes the industry landscape and redefines the relationship between brands and consumers. AI is not merely augmenting existing processes; it is fundamentally altering the nature of beauty creation, marketing, and consumption, from

revolutionizing product development and streamlining operations to delivering hyper-personalized experiences and fostering deeper emotional connections.

This research reveals several key insights. First, AI-powered tools are already deeply embedded in daily consumer experiences, often operating subtly without conscious awareness. This pervasive presence creates fertile ground for increased consumer acceptance of AI-driven beauty solutions, provided brands prioritize transparency and education to bridge the perception gap between AI usage and awareness. Second, consumer demand is a primary catalyst for AI adoption in beauty. Consumers increasingly expect personalized, relevant, and interactive experiences. AI is uniquely positioned to meet these expectations by delivering tailored product recommendations, anticipating needs, and fostering active consumer participation in the beauty journey. Third, ethical considerations surrounding AI, including bias, sustainability, workforce impacts, transparency, and the potential for misinformation, must be carefully addressed to ensure responsible and equitable implementation.

A particularly significant development is the emergence of AI agents. These autonomous entities represent a new frontier in intelligent systems, capable of proactively executing complex tasks, making decisions, and learning over time without constant human intervention. Poised to revolutionize the beauty industry, AI agents will further enhance personalization, streamline operations, optimize supply chains, and drive innovation. As AI agents become increasingly sophisticated, they will transition from tools to collaborators, working alongside humans to create dynamic and responsive beauty experiences. This shift necessitates a reassessment of leadership and organizational structures, requiring new approaches to decision-making, collaboration, and value creation.

The future of beauty is not about replacing human artistry and expertise with AI, but about empowering humans to use AI capabilities, including the collaborative potential of AI agents. Successful brands will embrace AI not as a replacement for human connection, but as a catalyst for deeper consumer engagement. By leveraging AI, including the evolving capabilities of AI agents, brands can enhance creativity, optimize operations, and personalize experiences with empathy and precision. This will create a future where beauty is not just a product, but a dynamic, personalized journey co-created by brands, consumers, and intelligent agents within an AI-powered ecosystem. Navigating this evolving landscape requires beauty brands to adapt not only their technological infrastructure but also their organizational strategies, leadership approaches, and workforce skill sets to effectively harness the transformative power of AI and AI agents.

While the precise trajectory of AI remains uncertain due to the rapid pace of technological development, the strategic imperatives for beauty brands remain clear: prioritize workforce

upskilling, invest in AI literacy and agent management, and maintain a human-centered approach to AI adoption, ensuring that technological advancements remain aligned with human values and consumer needs. By embracing a mindset of curiosity, experimentation, and continuous learning, beauty brands can harness AI's transformative power to create a future where beauty is both personalized and deeply human.

A. Your AI Playbook: Learn, Deploy, Future-Proof

To lead the future of beauty, brands must stop waiting for clarity and start building fluency. The most effective AI strategies aren't built around tools– they're built around mindset. To keep up with the rapid acceleration of artificial intelligence in today's business landscape, leaders will have to deliver an intentional and clear playbook that catapults their business toward integrating smart solutions.

1. Learn It.

- Build AI fluency across all functions, not just tech.
- Train teams on prompt design, model limits, and ethical usage.
- Encourage experimentation, curiosity, and exploration.

2. Deploy It.

- Pilot AI tools across the product lifecycle–from trend sensing to formulation to content creation.
- Don't wait for perfect conditions. Start small; learn fast; scale responsibly.
- Use AI to co-create with consumers–from personalized diagnostics to mood-based fragrance.

3. Future-Proof Everything.

- Redesign roles and teams to integrate AI agents as collaborators.
- Adopt new metrics that reflect AI's unique contributions.
- Keep the human at the center: trust, creativity, and emotional intelligence remain your most defensible assets.

The brands that succeed won't be those that waited for a perfect roadmap. They'll be the ones that moved, learned, and evolved in real time. Let this be your blueprint.

XV. Appendix

A. References

B. Infographic

C. Qualitative Research

D. Quantitative Research Survey Data

A. References:

AI Index. (2024). *Artificial Intelligence Index Report 2024*. https://aiindex.stanford.edu/report

Amazon. (2024). *How AI improves product recommendations*. https://www.aboutamazon.com/news/innovation-at-amazon/how-amaz on-uses-ai

Ascierto, R. (2018). *Uptime Institute Global Data Center Survey*. https://uptimeinstitute.com/resources/research-and-reports/uptime-inst itute-global-data-center-survey

Axios. (2025, January 15). *3 in 4 Americans use AI products – they just don't know it*.

https://www.axios.com/2025/01/15/americans-use-ai-products-poll Baek, M. (2025, April 15). *Think they sell pizza and clothes? Think*

again–Domino's and Uniqlo are tech giants. LinkedIn. https://www.linkedin.com/pulse/think-sell-pizza-clothes-againdominos- uniqlo-tech-giants-baek-missc

Barba, J. (2024, December 17). *Ulta doubles down on loyalty program, personalization*. P2PI.

https://p2pi.com/ulta-doubles-down-loyalty-program-personalization Best Buy. (2024). *Gift Finder: AI-powered holiday help*.

https://corporate.bestbuy.com/tag/gift-ideas/

Bhattacharya, J. (n.d.). *AI beauty technology stats*. SEO Sandwitch. Retrieved April 23, 2025, from

https://seosandwitch.com/ai-beauty-technology-stats/

AI for Brand Marketers [Conference session]. Microsoft, New York, NY. https://brand-innovators.com/events/ai-for-brand-marketers-msft-2025/

Buolamwini, J., & Friedman, B. (2024). *How the Federal Government Can Rein In A.I.*

https://www.nytimes.com/2024/01/02/opinion/federal-government-ai-re gulation.html

Business of Fashion. (2024). *How beauty brands are preparing for the AI future*. Business of Fashion.

https://www.businessoffashion.com/articles/technology/how-beauty-bra nds-are-preparing-for-the-ai-future/

Business of Fashion. (2024). *The future of beauty tech: AI and personalization*.

Business of Fashion. https://www.businessoffashion.com/articles/technology/the-future-of-be auty-tech-ai-and-personalization/

Chopra, E. (2025, February 15). *The talent stack of the future: Skills every team will need in the age of AI*. Substack. https://ektachopra.substack.com/p/the-talent-stack-of-the-future-skills

Chopra, E. (2025, March 5). *The 3 levels of AI literacy: What every executive needs to know*. Substack.

https://ektachopra.substack.com/p/the-3-levels-of-ai-literacy-what Chopra, E. (2025, April 10). *The 5 AI decisions every organization must make*.

Substack.

https://ektachopra.substack.com/p/the-5-ai-decisions-every-organizatio n

Chopra, E. (2025, June 7). *Understanding agentic AI: Why it's the next big shift for enterprise leaders*. Substack.

https://substack.com/home/post/p-165426179

Clark, J. (2024, February 15). *OpenAI files for IPO, signaling next phase in AI commercialization*. The Verge. https://www.theverge.com/2024/02/15/openai-ipo-generative-ai-valuatio n

Danon, B. (2018). *How GM and Autodesk are using generative design for vehicles of the future*. Autodesk. https://adsknews.autodesk.com/

Deepdub. (n.d.). *How Netflix leverages AI: Unveiling the tech behind the stream*. Retrieved April 23, 2025, from

https://deepdub.ai/post/how-netflix-leverages-ai-unveiling-the-tech-beh ind-the-stream

Deloitte. (2024). *State of AI in the enterprise*. Deloitte. https://www2.deloitte.com/global/en/pages/technology/articles/state-of- ai-in-the-enterprise.html

Di Benedetto, A. G. (2025, March 19). *Razer launches new Wyvrn game dev platform with automated AI bug tester*. *The Verge*. https://www.theverge.com/

DigitalDefynd. (2025). *10 ways Tesla is using AI* [Case Study]. https://digitaldefynd.com/IQ/tesla-using-ai-case-study/

Dominic Paulger. (2024). *Navigating Governance Frameworks for Generative AI Systems*.

https://fpf.org/blog/navigating-governance-frameworks-for-generative- ai-systems-in-the-asia-pacific

EPA. (2018). *Emissions & Generation Resource Integrated Database (eGRID)*. https://www.epa.gov/egrid

Fox43 News. (2025). *How AI came to rule our lives over the last decade*. https://www.fox43.com/article/news/how-ai-came-to-rule-our-lives-over- the-last-decade/521-496f5fbc-da5a-4602-9d70-3089229336d3

FPF. (2024). *AI Governance Behind the Scenes: Emerging Practices*. https://fpf.org/blog/ai-governance-behind-the-scenes

Fried, I. (2025, March 17). *Roblox rolls out AI for 3D object creation*. *Axios*. https://www.axios.com/

Gallup. (2025). *Americans use AI every day without realizing it*. https://news.gallup.com/poll/654905/americans-everyday-products-with out-realizing.aspx

Google. (2024, April). *Generative AI and the future of creative experimentation*. Think with Google. https://business.google.com/us/think/ai-excellence/generative-ai-creativ e-experimentation/

Google. (2024). *How Google Maps predicts traffic*. https://www.blog.google/products/maps/how-google-maps-predicts-tra ffic/

Gordon, C. (2024, January 30). *Replika launches new immersive AI wellness avatar experience*. *Forbes*. https://www.forbes.com/sites/cindygordon/2024/01/30/replika-launches- new-immersive-ai-wellness-avatar-experience/

Harvard Business Review. (2023). *AI's next frontier: Agents and autonomy*.

Harvard Business Publishing.

https://hbr.org/2023/11/ais-next-frontier-agents-and-autonomy

Haut.AI. (2024). *AI-powered skincare diagnostics*. https://haut.ai

Kumar, S. (2025). *Spotify's Discover Weekly: How Predictive Systems Built*. LinkedIn.

https://www.linkedin.com/pulse/spotifys-discover-weekly-how-predictiv e-systems-built-sandeep-kumar-zyktc/

Helen. (2025, April 11). *AI transforming energy industry* [Conference presentation]. Helen Data Summit, Helsinki. Presented by Mikko Muurinen.

LinkedIn Learning. (2024). *Workplace learning report*. LinkedIn Corporation. https://learning.linkedin.com/resources/workplace-learning-report

Lloyd, D. (2025, March 26). *Amazon's new AI feature, 'Interests,' lets customers describe their shopping needs*. *Amazon*. https://www.aboutamazon.com/

Lomanto, D., & Brommes, C. (2025, June 5). *From denim to data: American Eagle's seamless transition into AI-powered retail* [Webinar]. Writer.

L'Oréal. (2020). *Unveil Perso*.

https://www.loreal.com/en/news/research-innovation/unveil-perso-the-w orlds-first-ai-powered-device-for-skincare-and-cosmetics/

MedPath. (2025, April 30). *Exscientia claims world first as AI-created drug enters clinic*. Trial MedPath.

https://trial.medpath.com/news/8e36158a86bfc4c4/exscientia-claims-wo rld-first-as-ai-created-drug-enters-clinic

McKinsey Global Institute. (2022, December). *The state of AI in 2022–and a half-decade in review*. McKinsey & Company. https://www.mckinsey.com/capabilities/quantumblack/our-insights/the- state-of-ai-in-2022-and-a-half-decade-in-review

McKinsey & Company. (2024a). *State of AI in 2024*. McKinsey & Company. https://www.mckinsey.com/capabilities/quantumblack/our-insights/the- state-of-ai-in-2024

McKinsey & Company. (2025, January 6). *How beauty players can scale gen AI in 2025*.

https://www.mckinsey.com/industries/consumer-packaged-goods/our-i nsights/how-beauty-players-can-scale-gen-ai-in-2025

McKinsey & Company. (2025a). *Leaders underestimate employees' AI use*.

McKinsey & Company.

https://www.mckinsey.com/featured-insights/sustainable-inclusive-growth/charts/leaders-underestimate-employees-ai-use

McKinsey & Company. (2025b). *The personalization imperative*. McKinsey & Company.

https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights?utm_source=chatgpt.com

McKinsey & Company. (2025c). *Superagency in the workplace: Empowering people to unlock AI's full potential at work*. McKinsey & Company. https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/superagency-in-the-workplace-empowering-people-to-unlock-ais-full-potential-at-work

Meta. (2023). *Building Generative AI Responsibly*. https://ai.facebook.com/blog/building-generative-ai-responsibly/

Morris, C. (2024, December 17). *Oreo maker is using AI to come up with new snack flavors*. *Fast Company*. https://www.fastcompany.com/

Muralidharan, V., Adeleye Adewale, B., Huang, C. J., et al. (2024). A scoping review of reporting gaps in FDA-approved AI medical devices: Implications for bias and health equity. *npj Digital Medicine, 7*, Article 273. https://doi.org/10.1038/s41746-024-01270-x

NVIDIA. (2025). *NVIDIA Releases Digital Human Microservices*. https://nvidia.com/

OMR. (2025, May 6). *OMR Festival 2025* [Conference]. Hamburg, Germany. https://omr.com/en/events/omr24

One Club. (2024). *Snickers AI*. *The One Show*. https://www.oneclub.org/awards/theoneshow/-award/57141/snickers-ai/

Online National Survey. (2025). *Artificial Intelligence Quantitative Survey: Beauty and Personal Care Consumer Insights*. N = 509 Men, Women.

OpenAI. (2024). *What is an AI agent?* OpenAI. https://openai.com/research/what-is-an-ai-agent

Osmo. (2025). *Osmo's AI molecular platform Forge creates new fragrance molecules 4x faster*. Osmo. https://www.osmo.ai

Pano AI. (2025, May). *Real-time wildfire detection systems*. The Project (YouTube). https://www.youtube.com/watch?v=Kl2UHSsokVg

Parkkinen, J. (2024). *How AI reduces beauty product returns*. *LUX Retail Journal*.

Perfect Corp. (2025, May 20). *The Beauty AI NYSE Luncheon* [Conference session]. New York Stock Exchange, New York, NY.

Peters, J. (2023, March 9). *Spotify's new AI DJ will talk you through your playlist like a real host*. *The Verge*. https://www.theverge.com

Petryszak Mudd, B. (2023). *Personalizing user experiences with generative AI*. *Medium*.

https://medium.com/@BethanyPetryszakMudd/personalizing-user-expe riences-with-generative-ai-c83d62563435

Pfizer. (2025). *Artificial Intelligence: On a mission to make clinical drug development faster and smarter*. https://www.pfizer.com/

Premium Beauty News. (2023). *With Generation Osmo, aims to personalize fragrances through AI*.

https://www.premiumbeautynews.com/en/with-generation-osmo-aims- to,25430

Revieve. (2022). *Personalization and Data Privacy Balance in the Beauty Industry*.

https://www.revieve.com/insider/articles/personalization-data-privacy-ba lance-in-beauty

Rozencwajg, Y. (2025, February 20). *AI case study: Amazon's anticipatory shipping (and the genius inside)*. LinkedIn. https://www.linkedin.com/posts/yaelrozencwajg

Salesforce. (2025). *Agentic AI: Impact on workforce research*. Salesforce Newsroom.

https://www.salesforce.com/news/stories/agentic-ai-impact-on-workforc e-research

Salvagno, M., et al. (2023). *Can AI help for scientific writing?*

https://ccforum.biomedcentral.com/articles/10.1186/s13054-023-04200-

SpangleAI. (2025). *Spangle case studies: Real-time personalization and conversion lift*. SpangleAI. https://www.spangle.ai/resources/case-studies

Spotify. (2023). *How Spotify recommendations work*. https://newsroom.spotify.com/2023-spotify-algorithm/

Stanford HAI. (2025). *Artificial Intelligence Index Report 2025*. https://hai.stanford.edu/assets/files/hai_ai_index_report_2025.pdf

Stanford University. (2016). *Artificial Intelligence and Life in 2030: One Hundred Year Study on Artificial Intelligence: Report of the 2015–2016 Study Panel*.

https://ai100.stanford.edu/2016-report/appendix-i-short-history-ai Tangcay, J. (2023, February 22). *How the Rise of AI Tools Like Runway Are*

Changing Filmmaking. *Variety*. https://variety.com/

Taylor, M. (2024, March 2). *What OpenAI's public debut means for the AI economy.* Financial Times.

https://www.ft.com/content/openai-ipo-ai-market-analysis

Tesla. (2025). *Tesla reduced emergency repairs by 30% using AI-powered predictive maintenance–internal briefing document*.

The Economist. (2024, July 16). *A short history of AI*. https://www.economist.com/schools-brief/2024/07/16/a-short-history-of- ai

The Next Web. (2024, April 9). *Startup bags €22M to make driving safer with augmented reality*. https://thenextweb.com/

ThriveAI. (2025, March 25). *How ThriveAI agents operate as digital PMs*.

ThriveAI.

https://www.thriveai.com/news/ai-agent-product-management

Ulta Beauty. (2024). *Ulta Beauty's Skin Advisor and GlamLab tools*. https://www.ulta.com/featured/virtual-beauty-tools

UK Research and Innovation. (2023, July 6). *Exscientia: A clinical pipeline for AI-designed drug candidates*. https://www.ukri.org/

University of Strasbourg. (2024). *Adaptive visual marketing through AI: Netflix's personalization strategy*. https://mastertcloc.unistra.fr/2024/11/28/netflix-ux-design-algorithms-ad apt-streaming-content/

Visa. (2025, April). *Visa pilots autonomous shopping with OpenAI and Anthropic*. NewsNation Morning in America. https://www.newsnationnow.com/business/visa-ai-agent-pilot/

World Economic Forum. (2023). *The future of jobs report*. https://www.weforum.org/publications/the-future-of-jobs-report-2023/

B. Infographic

Bari Blitzer, Julia Buonanno-Godec, Marisa Hann, Miranda Huang, Brittany O'Leary, Delilah Owens-Schwartz, Vince Stavale, Rina Yashayeva

C. Qualitative Research Data

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- Andrew Videira, CMO, First Day
- Ania Sommerauer, Fashion Snoops
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- Diego Lomanto, Writer
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- Jeff Cohen, Amazon
- Julien Chardon, Global President, SkinCeuticals, L'Oreal
- Justin Cho, Amazon Studios, AI
- Kapil Dabi, Google
- Kara Babb, E-commerce & Channel Strategy Expert
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- Marek Michels, T&Pm
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- Raj Muhar, Amazon
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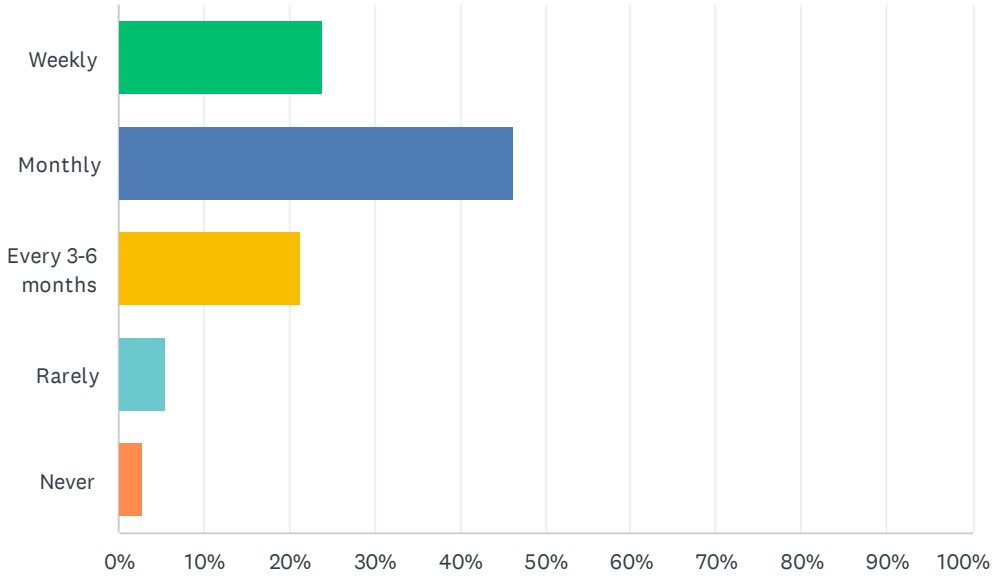
- Sandrine Gadol, Chief Innovation Officer, L'Oreal
- Sergio Peniche, Mars
- Shannen Biserta, Perfumer, IFF
- Simon Dolsten, Creative Director
- Vashisht Madhavan, Applied AI / ML | ex-YC founder, Snorkel AI, Uber
- Victoria Liu, Software Engineer, Blackrock
- Dr. Wayne W Dyer
- Wayne Liu, Chief Growth Officer, President of America, Perfect Corp

D. Quantitative Research Survey Data

Q1 How often do you purchase beauty or personal care products? (For example, hair products, fragrance, skincare, makeup, etc.)

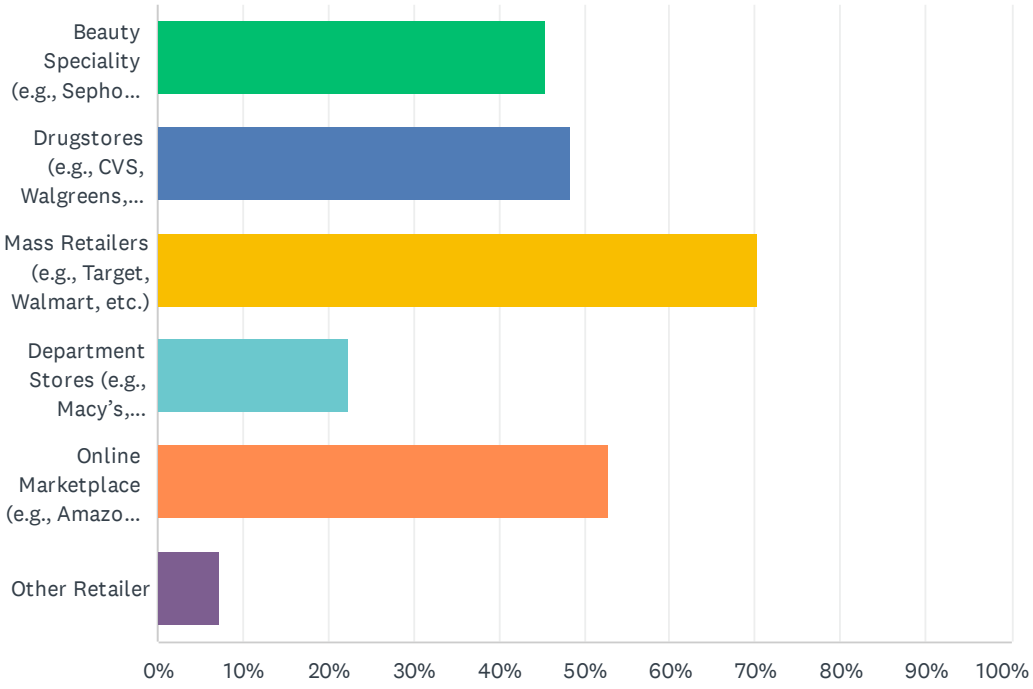
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Weekly	23.97%	122
Monthly	46.37%	236
Every 3-6 months	21.41%	109
Rarely	5.50%	28
Never	2.75%	14
TOTAL		509

Q2 Where do you primarily shop for beauty products? (Select all that apply)

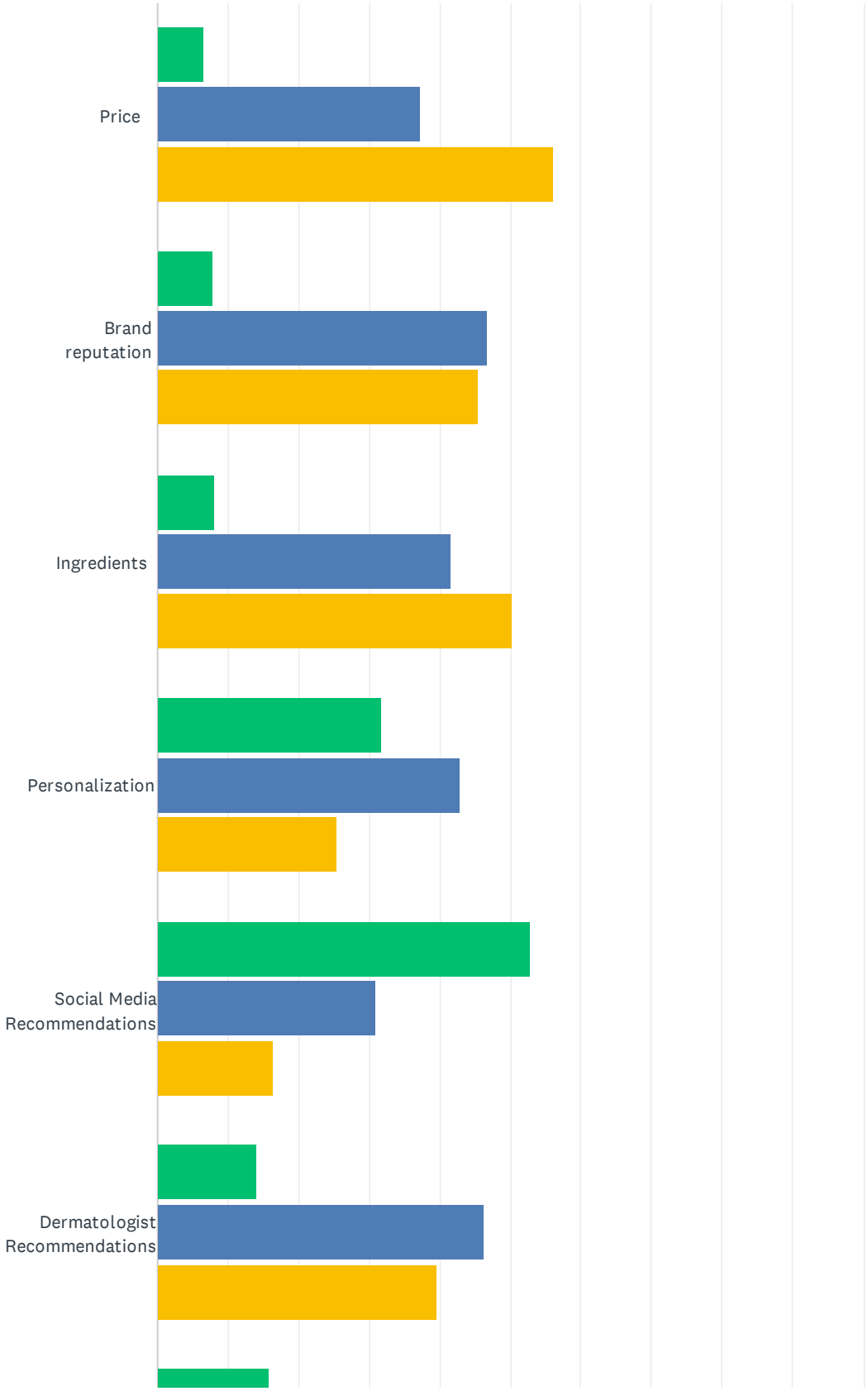
Answered: 509 Skipped: 0

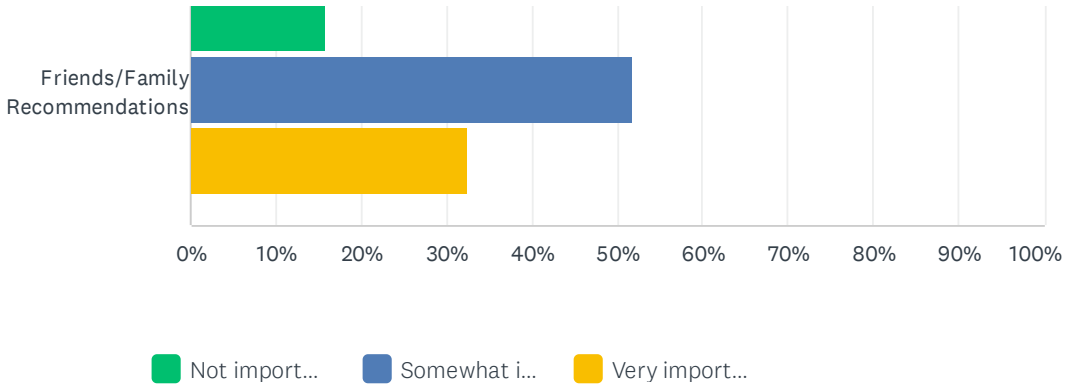


ANSWER CHOICES	RESPONSES	
Beauty Speciality (e.g., Sephora, Ulta, etc.)	45.38%	231
Drugstores (e.g., CVS, Walgreens, etc.)	48.33%	246
Mass Retailers (e.g., Target, Walmart, etc.)	70.33%	358
Department Stores (e.g., Macy's, Dillard's, etc.)	22.40%	114
Online Marketplace (e.g., Amazon, TikTok Shop, etc.)	52.85%	269
Other Retailer	7.27%	37
Total Respondents: 509		

Q3 How important are these factors in influencing your beauty purchase?

Answered: 496 Skipped: 13

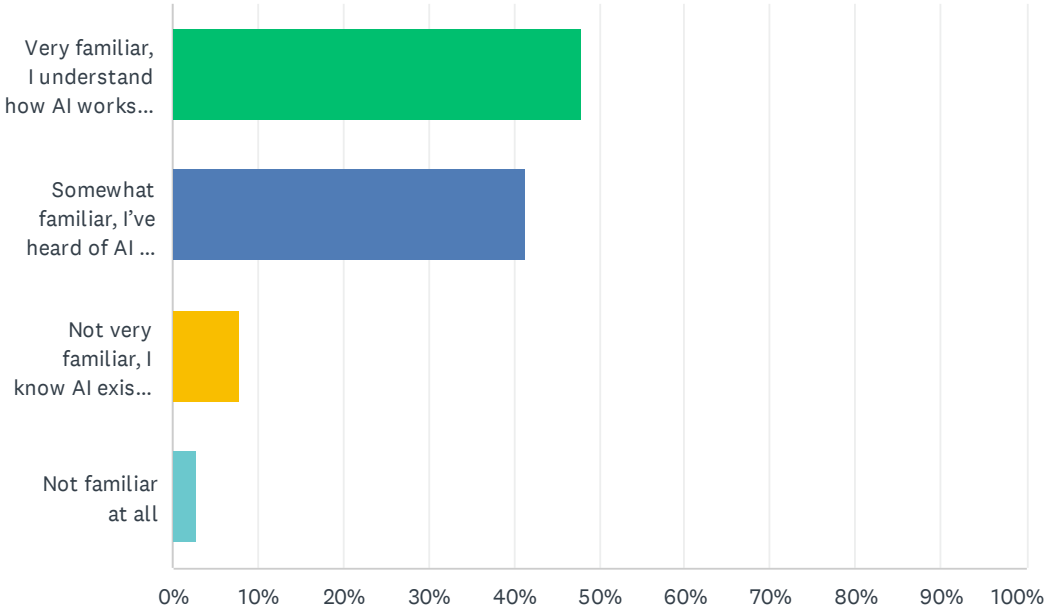




	NOT IMPORTANT	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Price	6.69% 33	37.32% 184	55.98% 276	493
Brand reputation	7.87% 38	46.79% 226	45.34% 219	483
Ingredients	8.11% 39	41.58% 200	50.31% 242	481
Personalization	31.74% 153	42.95% 207	25.31% 122	482
Social Media Recommendations	52.80% 255	30.85% 149	16.36% 79	483
Dermatologist Recommendations	14.11% 68	46.27% 223	39.63% 191	482
Friends/Family Recommendations	15.80% 76	51.77% 249	32.43% 156	481

Q4 How familiar are you with artificial intelligence (AI)?

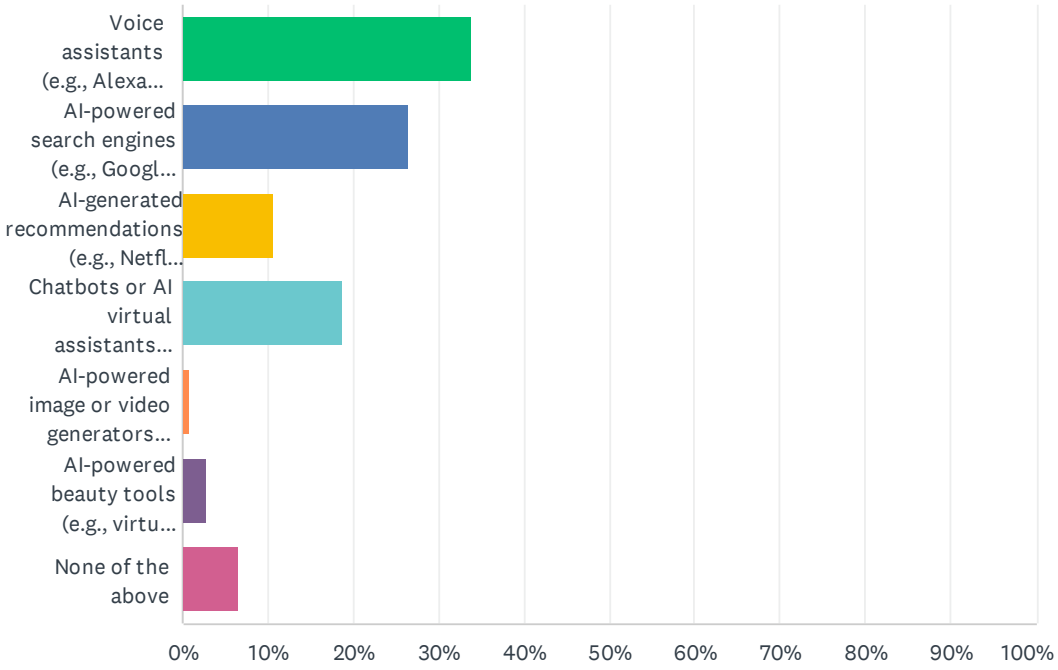
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very familiar, I understand how AI works and where it is used	47.94%	244
Somewhat familiar, I've heard of AI but don't fully understand it	41.45%	211
Not very familiar, I know AI exists but don't know much about it	7.86%	40
Not familiar at all	2.75%	14
TOTAL		509

Q5 Which of the following AI-powered technologies have you used? (Select all that apply)

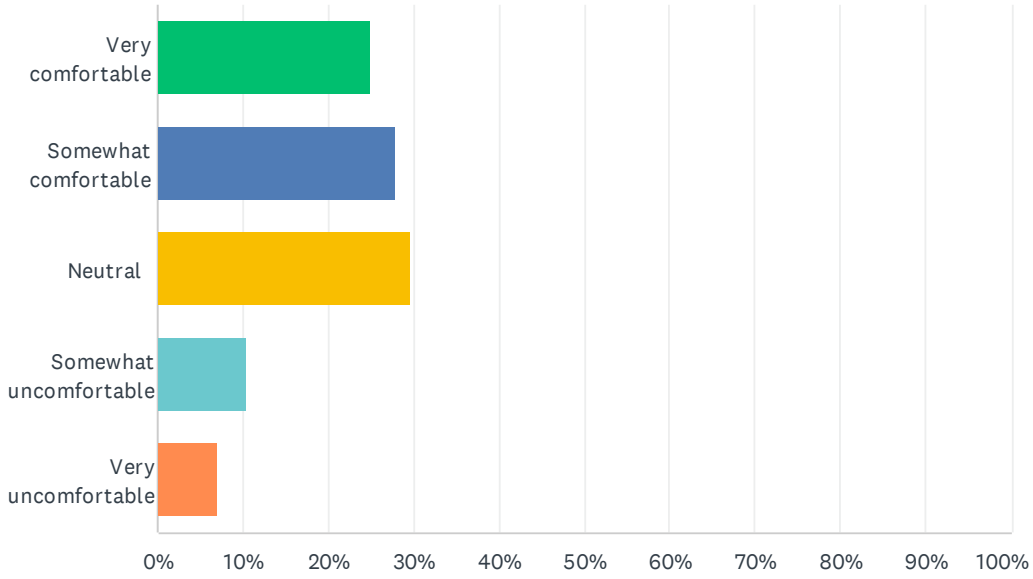
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Voice assistants (e.g., Alexa, Siri, Google Assistant, etc.)	33.99%	173
AI-powered search engines (e.g., Google Search, Bing AI, etc.)	26.52%	135
AI-generated recommendations (e.g., Netflix, Spotify, Amazon, etc.)	10.61%	54
Chatbots or AI virtual assistants (e.g., ChatGPT, customer service bots, etc.)	18.66%	95
AI-powered image or video generators (e.g., MidJourney, Lensa, DALL-E, etc.)	0.79%	4
AI-powered beauty tools (e.g., virtual makeup try-ons, AI skincare analysis, etc.)	2.75%	14
None of the above	6.68%	34
TOTAL		509

Q6 How comfortable are you with AI making recommendations for you in general (e.g., shopping, entertainment, healthcare, etc.)?

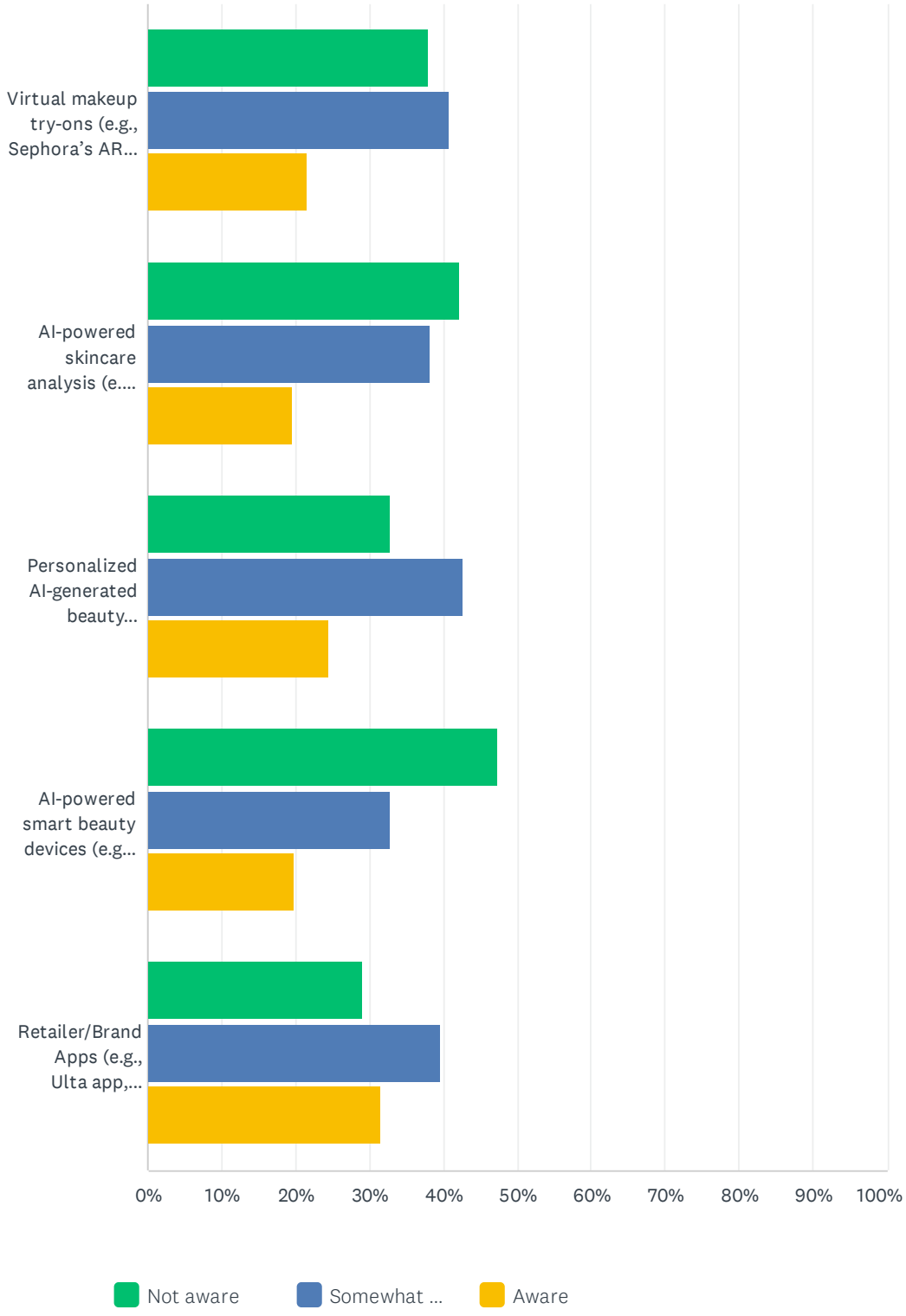
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very comfortable	24.95%	127
Somewhat comfortable	27.90%	142
Neutral	29.67%	151
Somewhat uncomfortable	10.41%	53
Very uncomfortable	7.07%	36
TOTAL		509

Q7 AI is already being used in your everyday beauty purchases, how aware are you of AI's role in these areas?

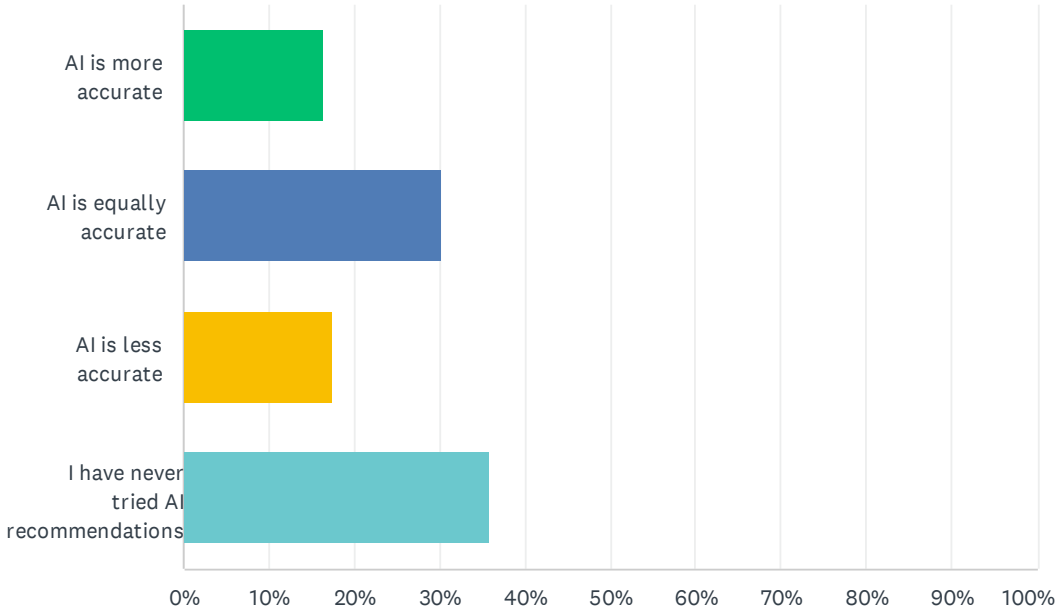
Answered: 494 Skipped: 15



	NOT AWARE	SOMEWHAT AWARE	AWARE	TOTAL
Virtual makeup try-ons (e.g., Sephora's AR mirror, etc.)	37.85% 187	40.69% 201	21.46% 106	494
AI-powered skincare analysis (e.g., SkinVision, Revieve, etc.)	42.26% 202	38.08% 182	19.67% 94	478
Personalized AI-generated beauty recommendations	32.78% 158	42.74% 206	24.48% 118	482
AI-powered smart beauty devices (e.g., FOREO, AI-powered hair tools, etc.)	47.40% 228	32.85% 158	19.75% 95	481
Retailer/Brand Apps (e.g., Ulta app, e.l.f. Cosmetics App, Redken Style App, etc.)	28.94% 136	39.57% 186	31.49% 148	470

Q8 Virtual try-ons and beauty recommendations online are generated by AI, how accurate do you find AI-driven beauty recommendations compared to human beauty advisors?

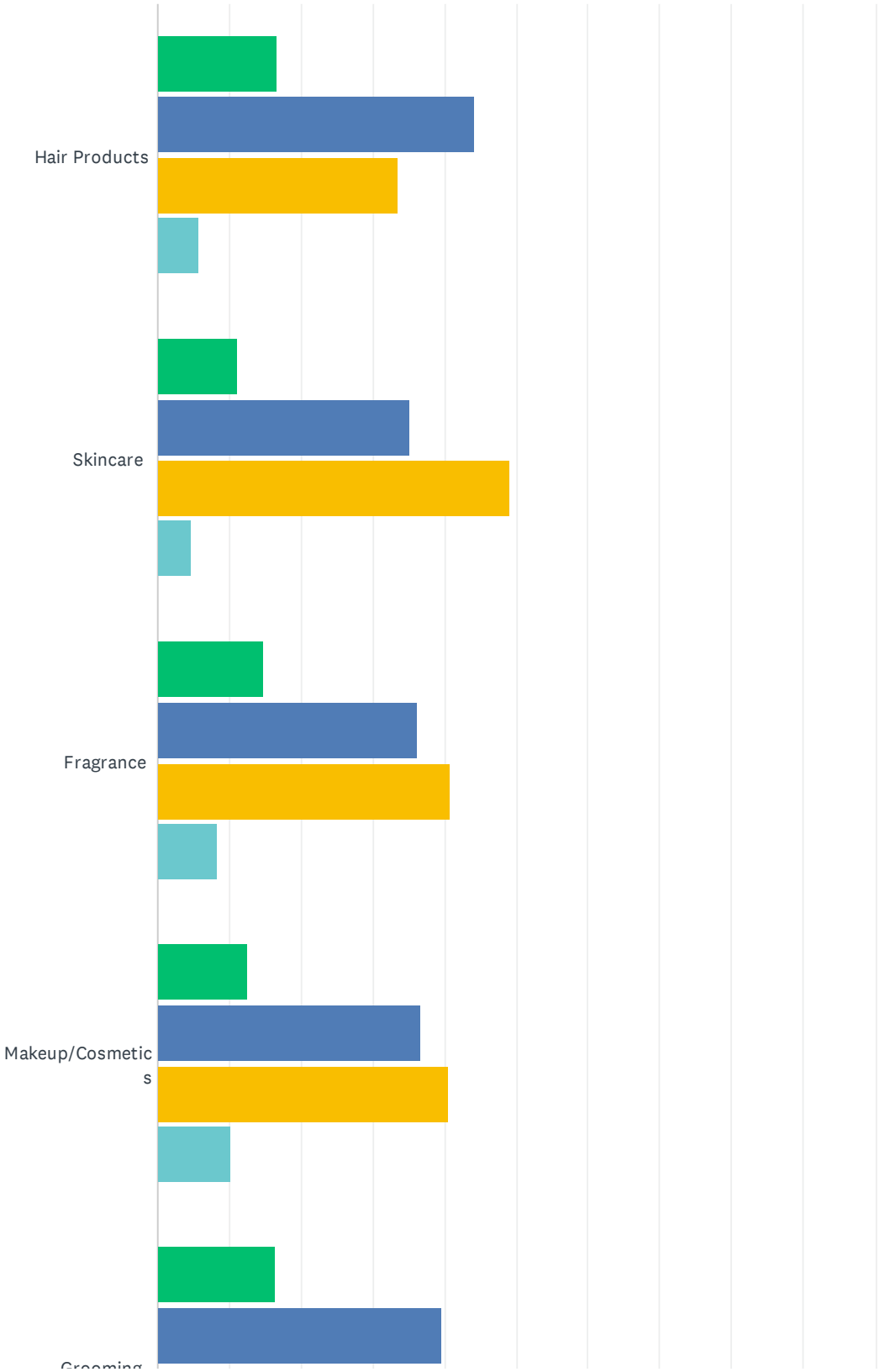
Answered: 509 Skipped: 0

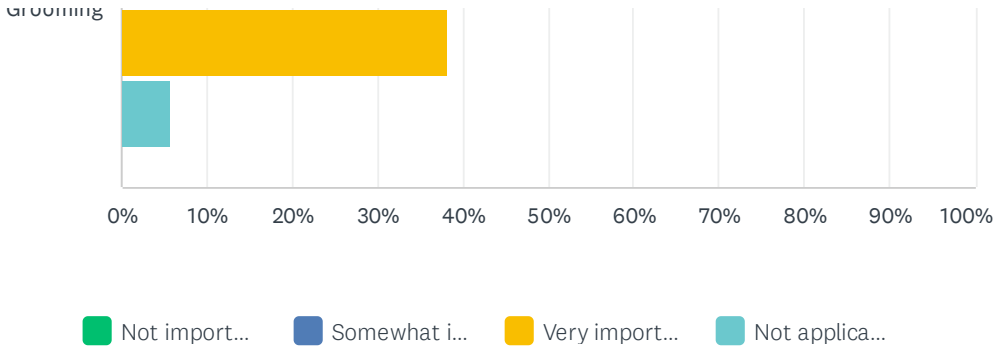


ANSWER CHOICES	RESPONSES	
AI is more accurate	16.50%	84
AI is equally accurate	30.26%	154
AI is less accurate	17.49%	89
I have never tried AI recommendations	35.76%	182
TOTAL		509

Q9 How important is product personalization to you when purchasing beauty products?

Answered: 496 Skipped: 13

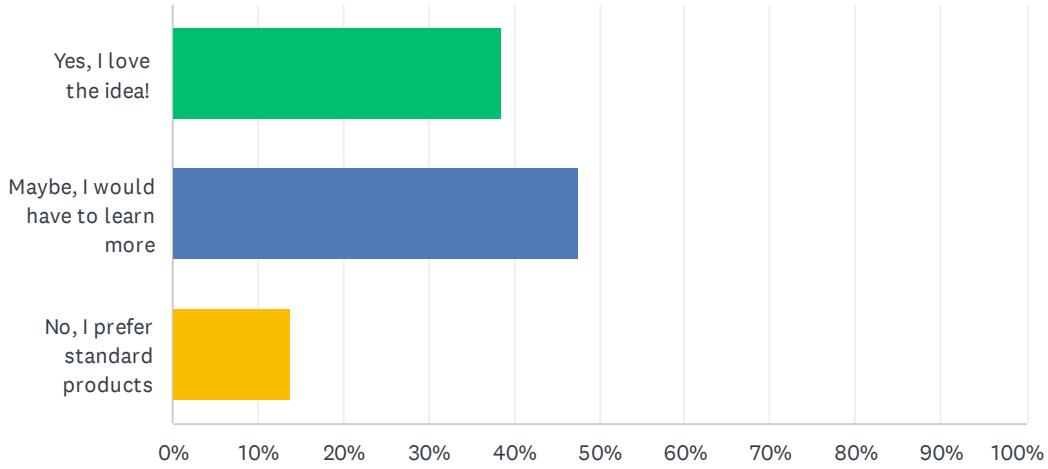




	NOT IMPORTANT	SOMEWHAT IMPORTANT	VERY IMPORTANT	NOT APPLICABLE	TOTAL
Hair Products	16.53% 82	44.15% 219	33.47% 166	5.85% 29	496
Skincare	11.11% 53	35.22% 168	49.06% 234	4.61% 22	477
Fragrance	14.76% 71	36.17% 174	40.75% 196	8.32% 40	481
Makeup/Cosmetics	12.63% 60	36.63% 174	40.42% 192	10.32% 49	475
Grooming	16.42% 77	39.66% 186	38.17% 179	5.76% 27	469

Q10 If cost was not an issue, would you be interested in a beauty brand that creates fully personalized products (e.g., AI-generated skincare formulas, custom foundation shades, tailored fragrances, etc.)?

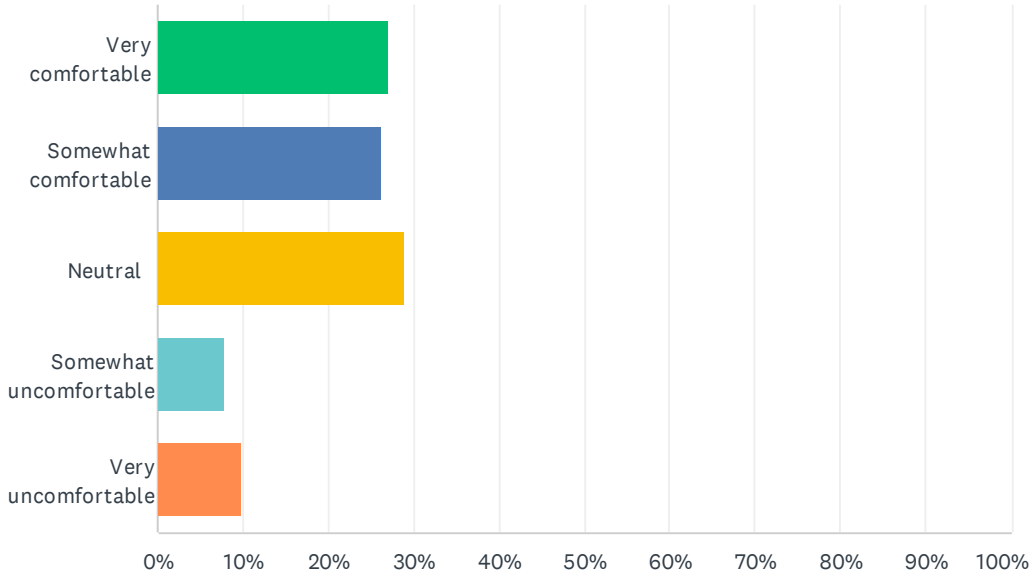
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, I love the idea!	38.51%	196
Maybe, I would have to learn more	47.54%	242
No, I prefer standard products	13.95%	71
TOTAL		509

Q11 How comfortable are you with AI analyzing your skin/hair data to suggest products (e.g., Beauty Genius AI Virtual Beauty Assistant by L'Oréal Paris)?

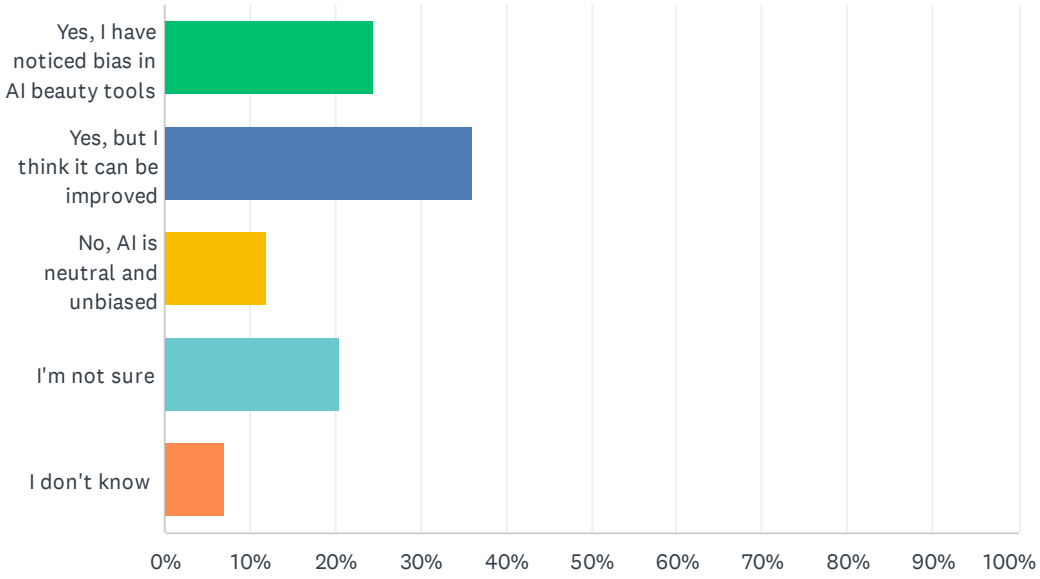
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very comfortable	27.11%	138
Somewhat comfortable	26.13%	133
Neutral	29.08%	148
Somewhat uncomfortable	7.86%	40
Very uncomfortable	9.82%	50
TOTAL		509

Q12 Do you believe AI in beauty can be biased (e.g., failing to recommend products for diverse skin tones, hair types, or gender identities, etc.)?

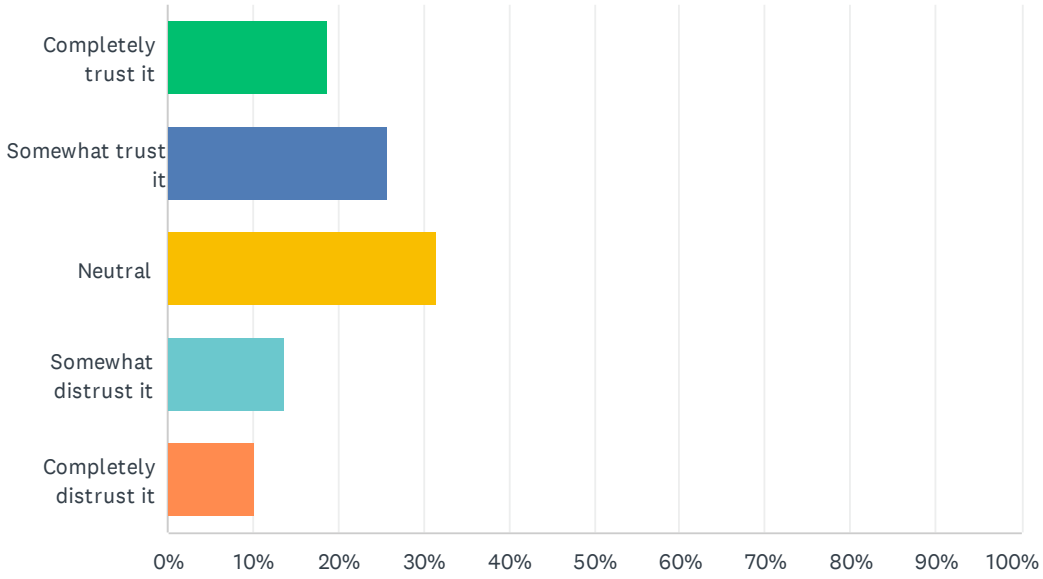
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, I have noticed bias in AI beauty tools	24.56%	125
Yes, but I think it can be improved	35.95%	183
No, AI is neutral and unbiased	11.98%	61
I'm not sure	20.43%	104
I don't know	7.07%	36
TOTAL		509

Q13 How much do you trust AI with your personal beauty data (e.g., skin scans, shopping behavior, beauty preferences, etc.)?

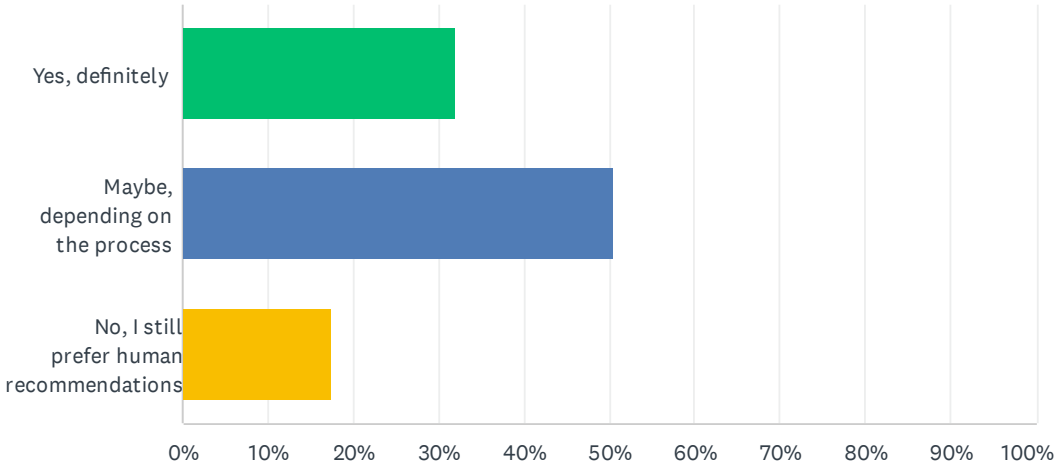
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Completely trust it	18.66%	95
Somewhat trust it	25.74%	131
Neutral	31.63%	161
Somewhat distrust it	13.75%	70
Completely distrust it	10.22%	52
TOTAL		509

Q14 If cost was not an issue and AI could guarantee better skincare or makeup results, would you be more likely to rely on it for purchasing decisions?

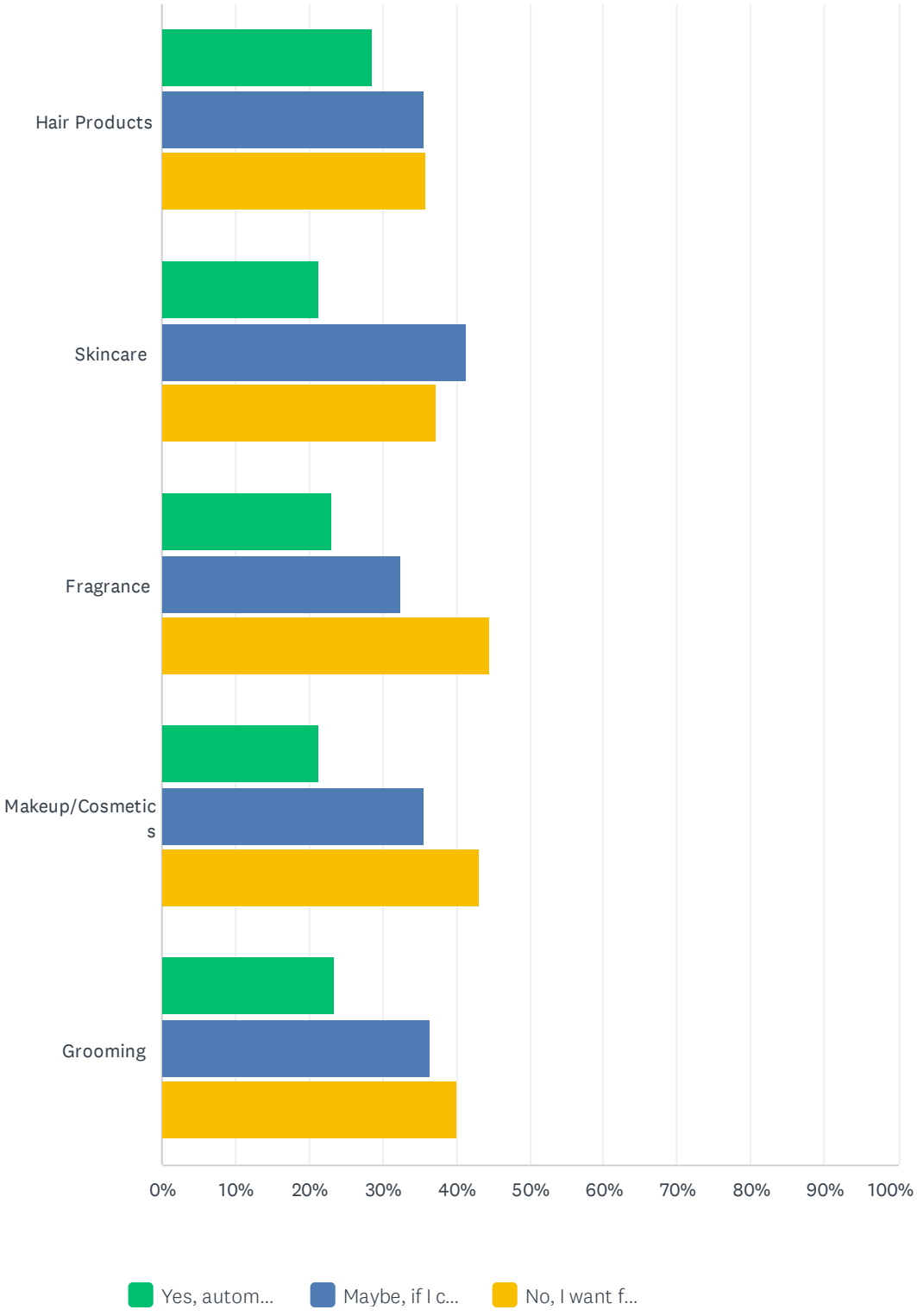
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, definitely	32.02%	163
Maybe, depending on the process	50.49%	257
No, I still prefer human recommendations	17.49%	89
TOTAL		509

Q15 Would you be comfortable having AI automatically reorder beauty products for you based on usage patterns?

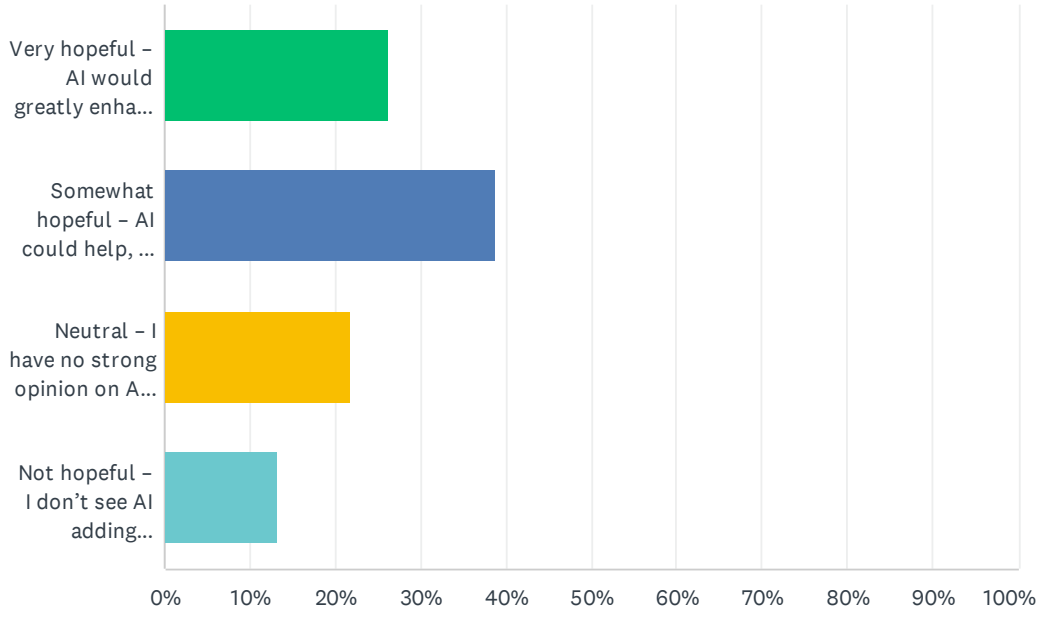
Answered: 493 Skipped: 16



	YES, AUTOMATIC REPURCHASING WOULD BE CONVENIENT	MAYBE, IF I COULD APPROVE EACH ORDER	NO, I WANT FULL CONTROL OVER PURCHASES	TOTAL
Hair Products	28.51% 140	35.64% 175	35.85% 176	491
Skincare	21.29% 102	41.34% 198	37.37% 179	479
Fragrance	23.01% 110	32.43% 155	44.56% 213	478
Makeup/Cosmetics	21.31% 101	35.65% 169	43.04% 204	474
Grooming	23.52% 111	36.44% 172	40.04% 189	472

Q16 An AI assistant uses artificial intelligence to help users with various tasks by understanding and responding to their needs through natural interaction and integration with other services. How hopeful are you that an AI assistant could improve your daily life?

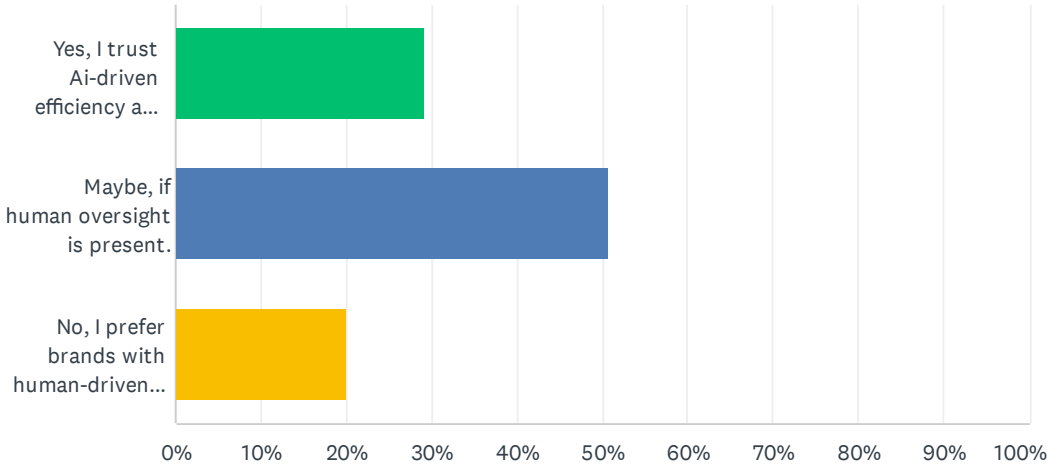
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very hopeful – AI would greatly enhance my efficiency and decision-making.	26.33%	134
Somewhat hopeful – AI could help, but I see limitations.	38.70%	197
Neutral – I have no strong opinion on AI's impact.	21.81%	111
Not hopeful – I don't see AI adding significant value.	13.16%	67
TOTAL		509

Q17 Many beauty brands use AI assisted technology. As an example, would you purchase a shampoo if you knew the formula was created by AI formulation?

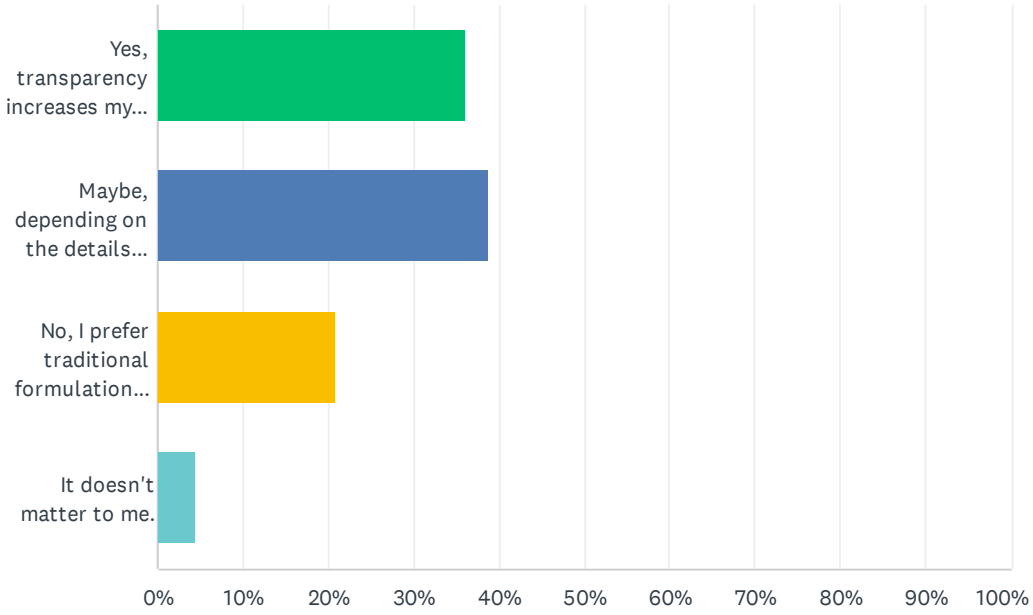
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, I trust Ai-driven efficiency and innovation.	29.27%	149
Maybe, if human oversight is present.	50.69%	258
No, I prefer brands with human-driven processes.	20.04%	102
TOTAL		509

Q18 In bringing the example from above, would you feel more confident in purchasing the AI-formulated shampoo if the brand provided detailed explanations on how AI formulates and tests products?

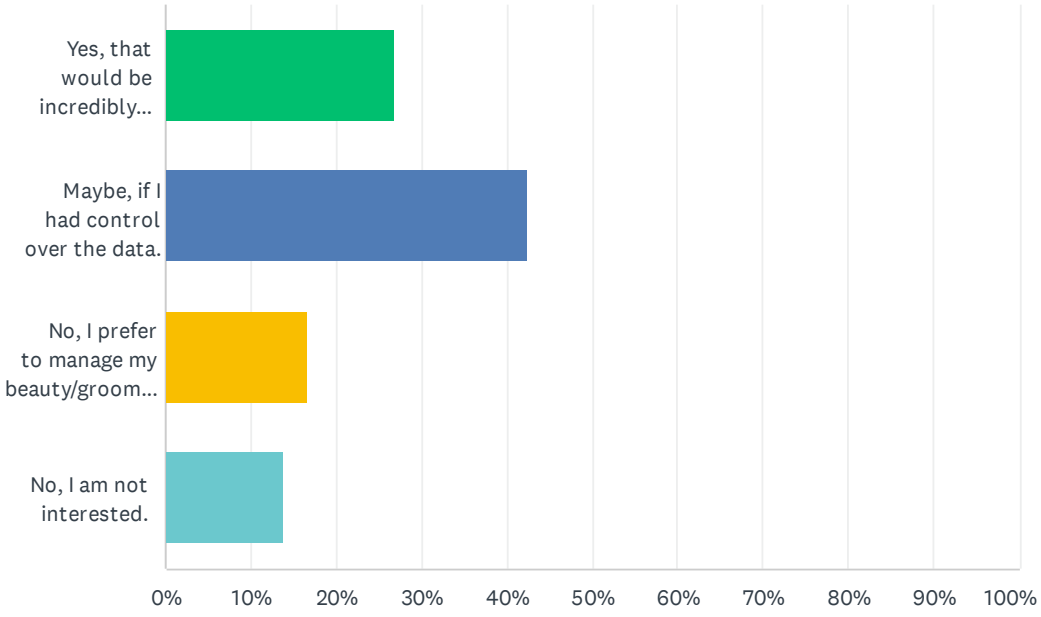
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, transparency increases my trust.	35.95%	183
Maybe, depending on the details shared.	38.70%	197
No, I prefer traditional formulation processes.	20.83%	106
It doesn't matter to me.	4.52%	23
TOTAL		509

Q19 Would you be interested in an AI-powered beauty consultant that trades your data and privacy for a customized skincare, beauty or grooming regimen that provides product effectiveness and evolving needs over time?

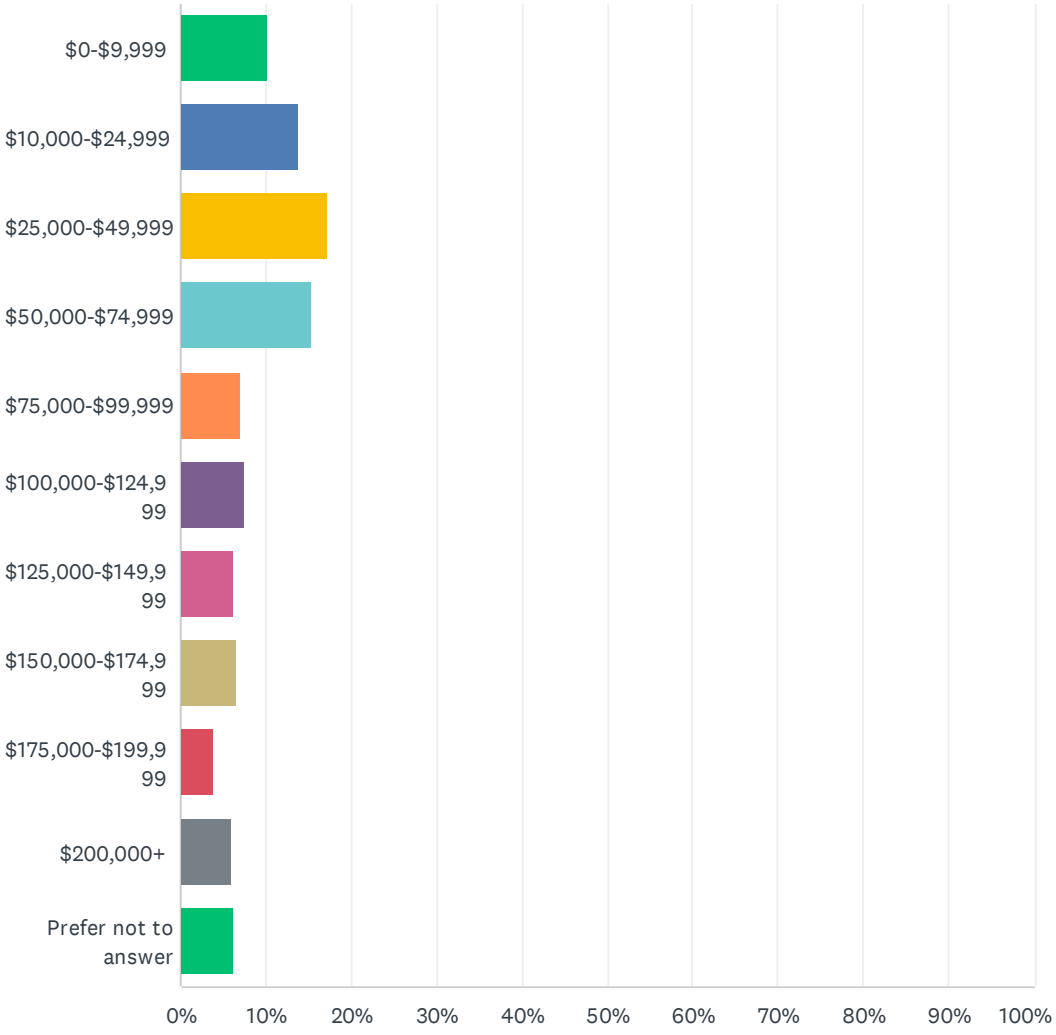
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, that would be incredibly useful.	26.92%	137
Maybe, if I had control over the data.	42.44%	216
No, I prefer to manage my beauty/grooming routine independently.	16.70%	85
No, I am not interested.	13.95%	71
TOTAL		509

Q1 Household Income

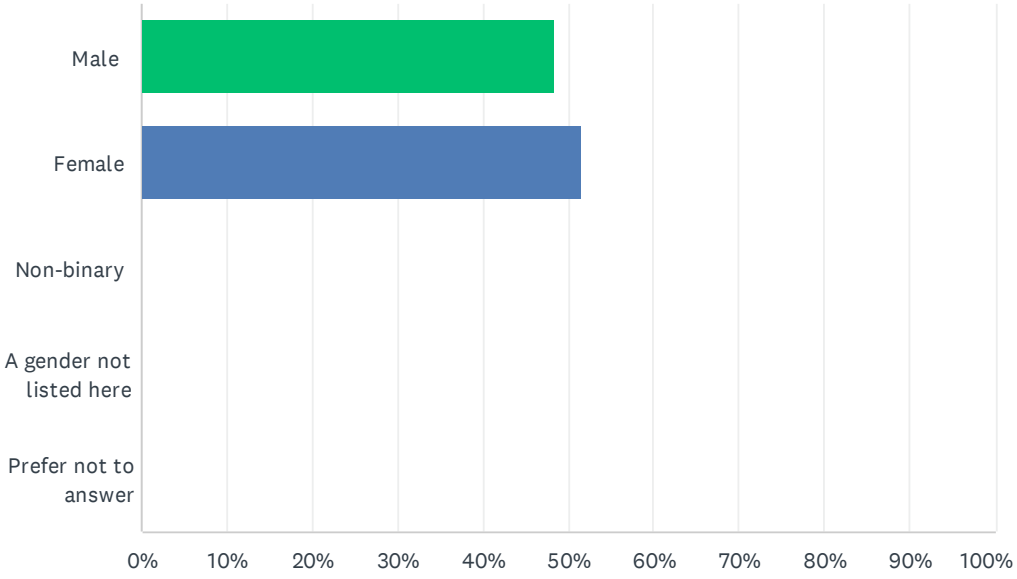
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
$0-$9,999	10.22%	52
$10,000-$24,999	13.95%	71
$25,000-$49,999	17.29%	88
$50,000-$74,999	15.32%	78
$75,000-$99,999	7.07%	36
$100,000-$124,999	7.47%	38
$125,000-$149,999	6.09%	31
$150,000-$174,999	6.68%	34
$175,000-$199,999	3.73%	19
$200,000+	5.89%	30
Prefer not to answer	6.29%	32
TOTAL		509

Q2 Gender

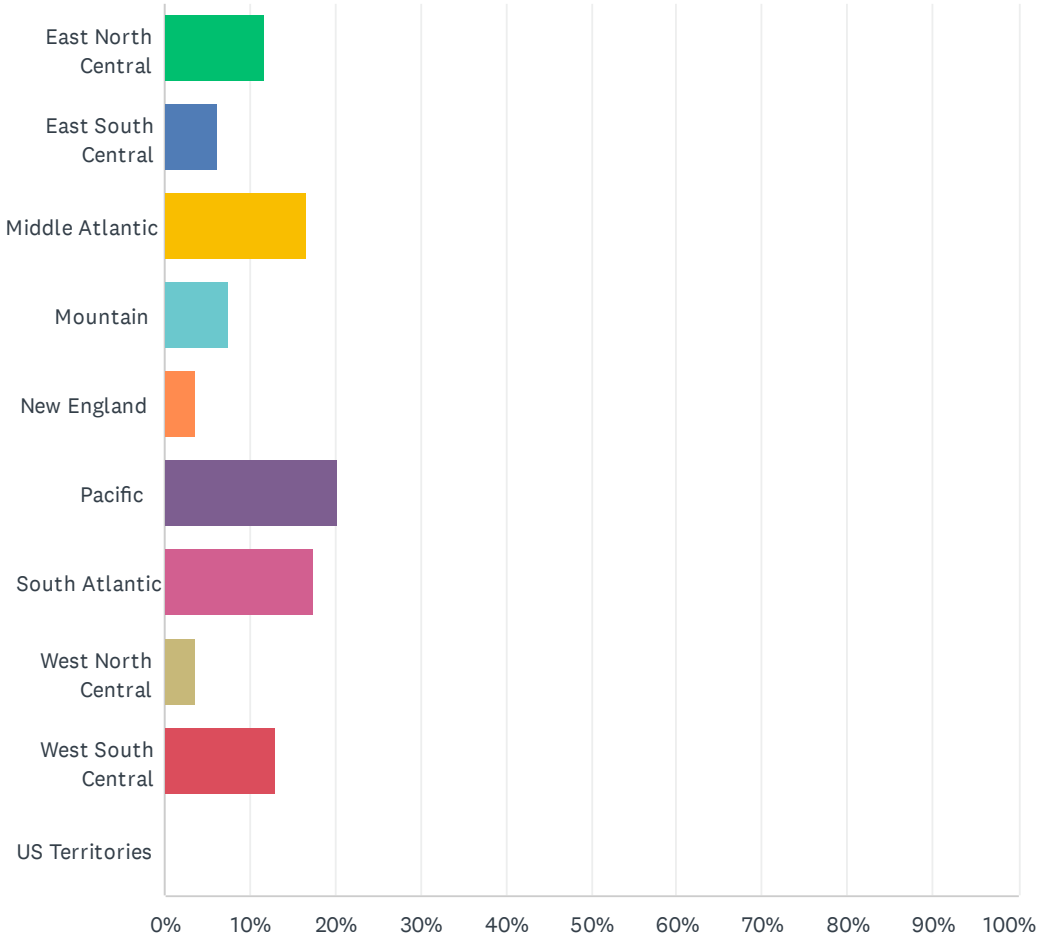
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
Male	48.33%	246
Female	51.67%	263
Non-binary	0.00%	0
A gender not listed here	0.00%	0
Prefer not to answer	0.00%	0
TOTAL		509

Q3 Major US Region

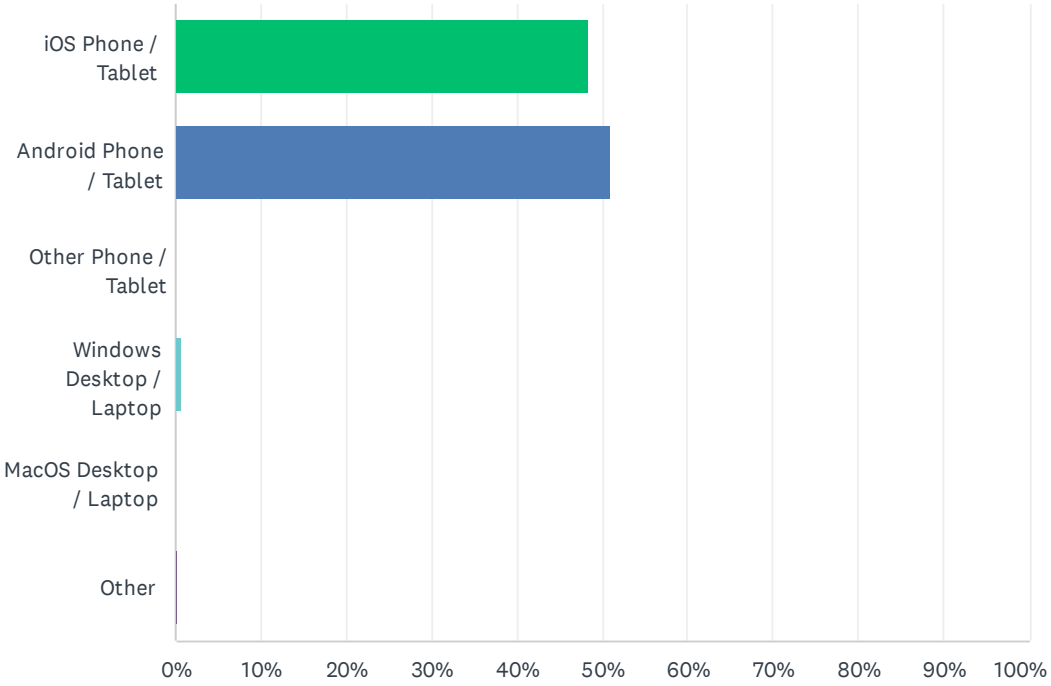
Answered: 498 Skipped: 11



ANSWER CHOICES	RESPONSES	
East North Central	11.65%	58
East South Central	6.22%	31
Middle Atlantic	16.67%	83
Mountain	7.43%	37
New England	3.61%	18
Pacific	20.28%	101
South Atlantic	17.47%	87
West North Central	3.61%	18
West South Central	13.05%	65
US Territories	0.00%	0
TOTAL		498

Q4 Device Type

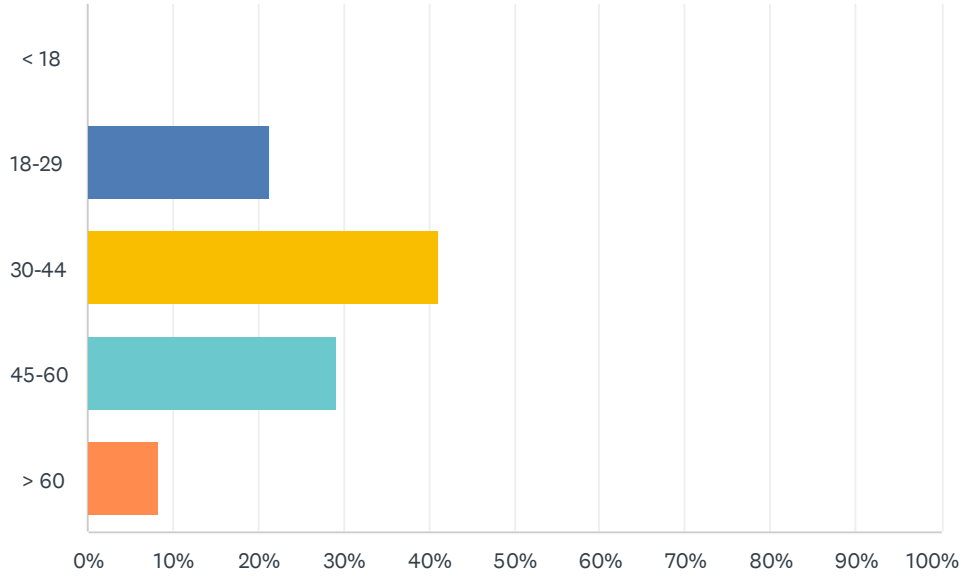
Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
iOS Phone / Tablet	48.33%	246
Android Phone / Tablet	50.88%	259
Other Phone / Tablet	0.00%	0
Windows Desktop / Laptop	0.59%	3
MacOS Desktop / Laptop	0.00%	0
Other	0.20%	1
TOTAL		509

Q5 Age

Answered: 509 Skipped: 0



ANSWER CHOICES	RESPONSES	
< 18	0.00%	0
18-29	21.41%	109
30-44	41.06%	209
45-60	29.27%	149
> 60	8.25%	42
TOTAL		509