



NEXT IN VOGUE

SINGAPORE

2024 INNOVATION REPORT
THE IMPACT OF AI ON THE CREATIVE INDUSTRY

POWERED BY **brinc**



As we gathered for NEXT IN VOGUE this year, we were both inspired and humbled by the overwhelming response. What began as a modest initiative has grown into a movement of over 1,100 minds, united by curiosity and a shared commitment to change.

This year's theme, "AI and I," captured the heart of our mission—to explore not only the transformative power of AI but also its profound implications for our creative and ethical landscape. Change is never easy, especially when the change agent is as powerful as artificial intelligence. Like any profound shift, AI compels us to confront our own adaptability and asks whether we can master this tool without being mastered by it.

At *Vogue* Singapore, our belief is simple: we must approach AI with courage, curiosity, and an unshakeable commitment to ethical stewardship. The challenge, then, is not to fear AI but to cultivate a value system that protects our way of life and preserves creativity for future generations. We're facing a societal pivot, a crisis of orientation if you will. As AI begins to shoulder tasks once uniquely human, we're called to redefine our roles.

How will we refocus creativity and influence for meaningful change? In times of rapid transformation, the arts and human ingenuity will give purpose and direction. The question is no longer if we engage with AI, but how. With the urgency of our global issues—climate, health, sustainable growth—AI may be the tool that accelerates our answers. This innovation report, powered by Brinc, a leader in global venture acceleration, builds on the key themes explored throughout NEXT IN VOGUE around the topic of AI, and aims to establish a platform that drives smart change.

After all, we are the change—We are *Vogue* Singapore.

Bettina von Schlippe
Publisher, Vogue Singapore

ABOUT
VOGUE SINGAPORE



Since its inception in 2020, *Vogue Singapore* has been committed to exploring the intersection between fashion and innovation, and their impact on the creative economy. It consistently pushes the envelope with its innovation initiatives, such as the first Vogue NFT issue (September 2021), an AI-generated cover (March 2023), a cover that physically reacts to heat (September 2023) and an NFC-enabled cover that allowed readers to dive into an audio experience (October 2023).

Continuing this journey, in November 2023, *Vogue Singapore* launched its landmark event, NEXT IN VOGUE. Returning for its second year in 2024, the event was held on 16 and 17 October, and brought together global and regional thought

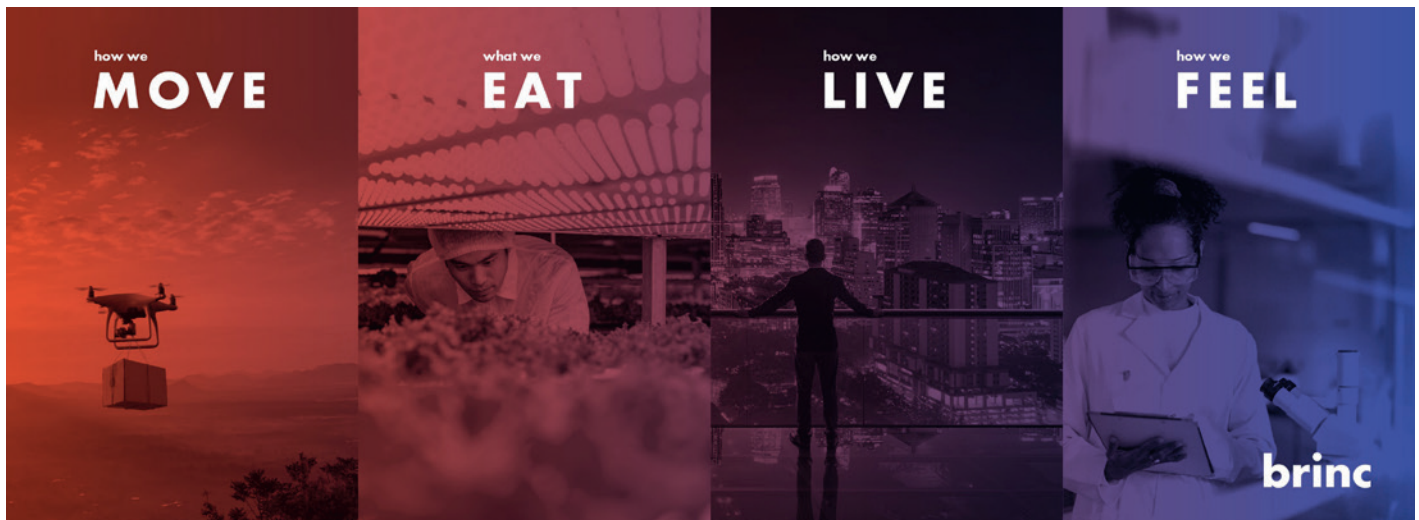
leaders to share insights on the future of fashion, beauty and culture through the lens of innovation, to an audience of over 1,000 guests.

Anchored in four key activations, NEXT IN VOGUE included NEXT IN VOGUE Conversations, 14 panel discussions investigating the impact of artificial intelligence on the fashion, beauty and creative industries, and the importance of the human touch in this digitally evolving world; *Vogue Closet*, an exhibition of red-carpet celebrity fashion exclusively by Asian designers; *Vogue Innovation Showcase*, a one-of-a-kind digital fashion experience; and *Vogue Glam Room*, offering masterclasses and an interactive display of innovative beauty brands.

ABOUT
BRINC

Brinc is a leader in global venture acceleration and operates 15+ multidisciplinary accelerator programmes across seven countries. Accelerating startups focused on climate technology, carbon dioxide removal, food technology, blockchain technology, artificial intelligence, Web3, connected hardware, robotics and the Internet of Things. Brinc's mission is to create a more sustainable, equitable and inclusive future. Brinc has announced plans to raise a series of venture funds to invest in high-potential, early-stage companies through accelerators and provide limited partnerships with a dedicated innovation platform and access to Series A+ co-investment opportunities.

Brinc further supports corporations with distributed innovation strategies, sourcing new startups and technologies, and venture capital as a service. Global corporations (Manulife, Huawei, Schneider Electric, Puma, Batelco, Merck, Omantel, Linrun Group, Zhihui Park), government organisations (Hong Kong Science Park, NEOM, MBRIF, Guangdong Soft-tech Park), tertiary institutions (HK City University, National University of Singapore), fast-growing companies (Animoca Brands, The Sandbox) and leading venture funds (Artesian, LeverVC, Tamkeen, EDB, Hatcher+) have all run programmes with Brinc. Learn more: brinc.io



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Artificial intelligence (AI) has had a transformative impact across industries and the fashion industry is no exception, with projections indicating that investment from the retail industries into AI technology will surge to above US\$31 billion by 2028¹. From revolutionising supply chains and customer experience to challenges in data privacy and bias in algorithms, this report provides a comprehensive analysis of the profound and ongoing impact of AI across the creative industry, supplemented by key insights across NEXT IN VOGUE panels and keynotes given by global thought leaders.

Part I

Generative AI - Catalyzing Innovation in the Fashion Industry

Generative AI has emerged as a powerful tool that is revolutionizing fashion marketing and enhancing the customer experience. Insights from Liz Bacelar's keynote highlight how businesses can navigate the chaos to focus on meaningful transformation. The role of AI in optimizing fashion supply chains is also explored, demonstrating its potential to streamline operations and enhance efficiency.

Part II

Generative AI's Impact on Beauty

The beauty industry is undergoing a significant transformation with the integration of AI. Real-life case studies illustrate how AI is personalizing beauty solutions, monitoring wellness and health, and innovating cosmetic product development. This section critically examines the ethical considerations and challenges inherent in AI-driven beauty, offering a balanced perspective on its implications.

Part III

AI's Influence on Creative Lifestyles (Art, Architecture & Culinary)

AI is reshaping the creative landscape, affecting art, architecture, and culinary arts. The transformative impact of AI on art is explored, including insights from a panel discussion from Next in Vogue, featuring Krista Kim, Cyril Foiret, and Debra Langley. This part also highlights AI's role in architectural innovation and its influence on culinary arts, emphasizing the complementary relationship between human creativity and machine intelligence.



¹World Economic Forum - Here's how artificial intelligence can benefit the retail sector <https://www.weforum.org/stories/2023/01/here-s-how-artificial-intelligence-benefit-retail-sector-davos2023/>



Part IV

Challenges in AI: Operational and Ethical Dilemmas

The report addresses the operational and ethical challenges associated with AI deployment. Key ethical issues in AI for fashion include data privacy and security, copyright and intellectual property concerns, as well as bias and fairness in AI algorithms. Ensuring transparency and accountability in AI operations is crucial. Additionally, operational challenges such as effective data management, seamless integration with existing systems, and resource allocation are discussed. This section concludes with lessons learned from AI challenges and failures, stressing the need for continuous improvement.

Part V

Future Directions and Recommendations

Emerging trends in AI for fashion are identified, focusing on hyper-personalization, supply chain integration, and innovative applications like virtual try-ons. The importance of best practices for ethical AI use is emphasized, advocating for robust data privacy measures, inclusivity, and transparency. The report calls for collaboration among AI developers, fashion designers, and stakeholders to drive innovation responsibly.

In conclusion, this research underscores AI's transformative potential in the fashion industry while highlighting the importance of ethical considerations and operational efficiency. By leveraging AI responsibly, the fashion industry can achieve sustainable growth and innovation.

PART I

GENERATIVE AI

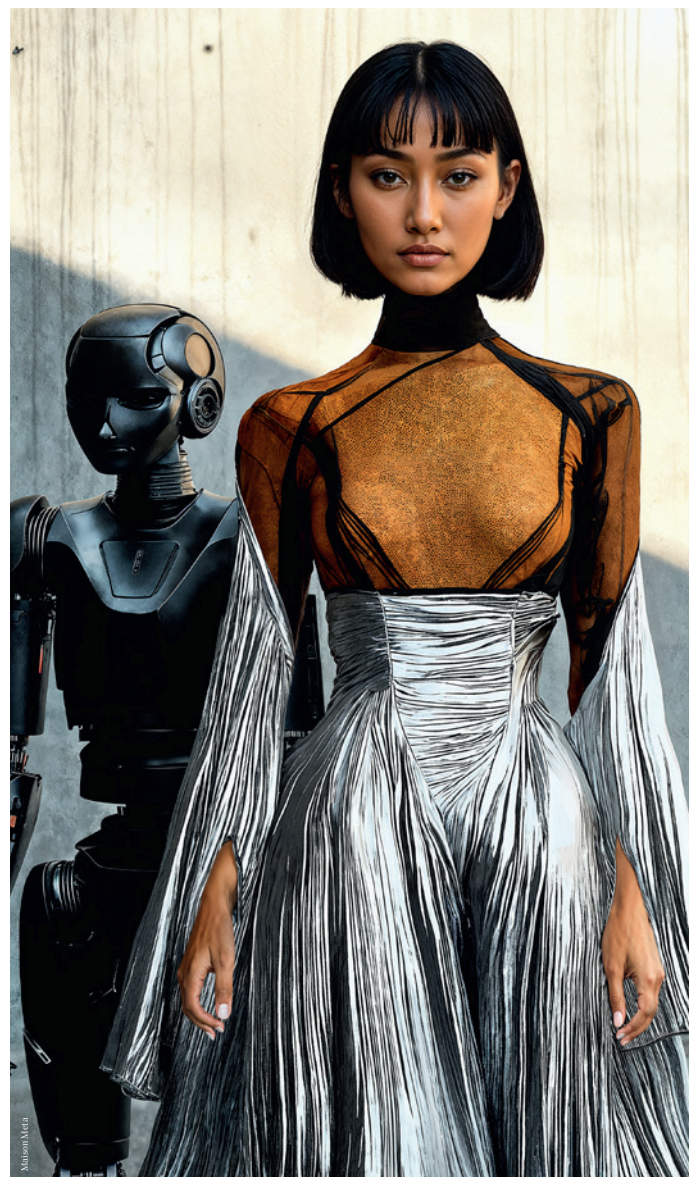
Catalyzing Innovation in the Fashion Industry

The integration of AI in the fashion industry is more than a technological enhancement—it signifies a paradigm shift in the industry landscape, revolutionizing how brands engage with their consumers. By tapping into AI’s dynamic insights, brands are elevating customer experiences and devising strategies that do more than communicate—they resonate deeply². The rise of generative AI, exemplified by models like DALL-E and GPT-4.0, intensifies competition by enabling innovative content creation and accurate task execution. This innovation positions the fashion and luxury sectors at the brink of an unprecedented expansion, with forecasts predicting a \$275 billion increase in value over the next five years, setting new standards for style and creativity³.

Adopting generative AI will revolutionize content creation and collaborative design, driving creativity and efficiency. Foundation models like LLaMA from Meta AI exemplify the benefits of open and accessible technologies, enabling applications in trend prediction, design generation, and improved customer engagement⁴. By incorporating these advanced AI capabilities, the fashion industry will embrace a future where data sovereignty is paramount, ensuring ethical use while fostering creativity. The inclusion of diverse voices in AI development, particularly women’s participation, will foster ethical practices and innovation. As the industry evolves, embracing a variety of AI tools will be essential for staying competitive in this dynamic landscape.

Revolutionizing Fashion Marketing and Customer Experience Enhancement

Generative AI is set to redefine the landscape of customer engagement in fashion marketing, offering an unprecedented personalization that seems intuitively tailored to each individual. As fashion brands depend on discerning market trends to understand customer desires, leveraging generative AI has become indispensable for crafting personalized advertising content and pinpointing specific consumer demographics⁵. This approach significantly evolved from traditional marketing strategies, which segmented audiences based on essential criteria like location, age, and interests. Instead, generative AI facilitates hyper-personalization across various touchpoints, including in-store experiences, online shopping platforms, and targeted ad campaigns.

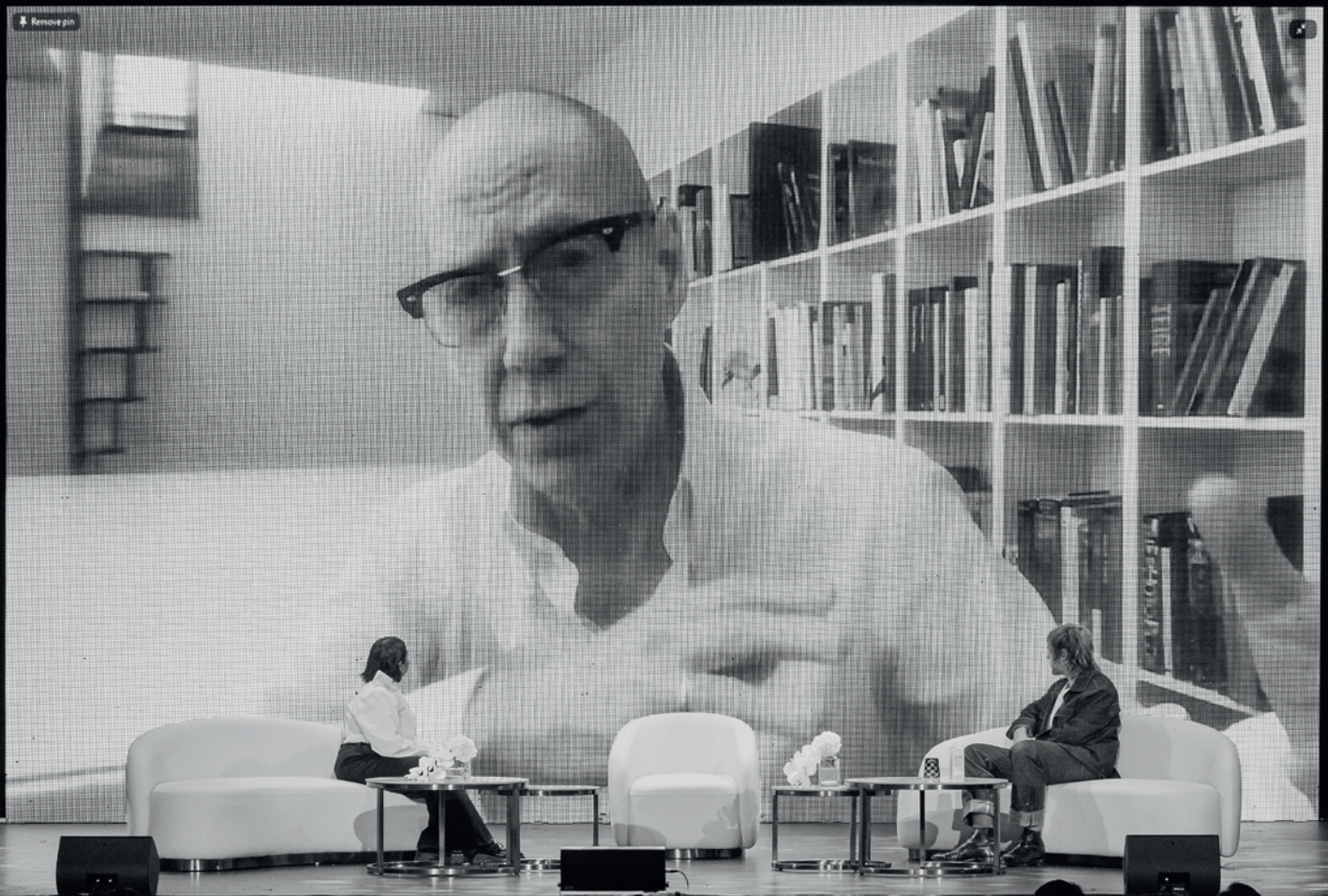


²(Harreis et al., 2023). Harreis H., Koullias T., Roberts R., & Te K. (2023, March 8). Generative AI: Unlocking the future of fashion. McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/generative-ai-unlocking-the-future-of-fashion>

³Harreis H., Koullias T., Roberts R., & Te K. (2023, March 8). Generative AI: Unlocking the future of fashion. McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/generative-ai-unlocking-the-future-of-fashion>

⁴LLaMA: Open and Efficient Foundation Language Models: <https://arxiv.org/abs/2302.13971>

⁵(Islam et al., 2024). Islam, T., Miron, A., Nandy, M., Choudrie, J., Liu, X., & Li, Y. (2024). Transforming Digital Marketing with Generative AI. *Computers*, 13(7), 168.



Panel Insights

THE NEW LENS: HOW TECHNOLOGY IS TRANSFORMING FASHION PHOTOGRAPHY

Speakers:

NICK KNIGHT CBE

*Fashion Image-Maker and
Director of SHOWstudio*

CALUM KNIGHT

Creative Director

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The panel discussion featured renowned image-maker Nick Knight, who explored the evolving landscape of creativity in the digital age. The conversation began with Knight's insights on distinguishing photography from broader image-making, highlighting the integration of various artistic forms and technologies that shape audience engagement. A significant portion of the discussion was dedicated to the transformative impact of generative AI on the photographic process. Knight emphasised how generative AI has revolutionised the industry by automating time-consuming tasks such as background removal, image enhancement and even generating entirely new, hyper-realistic images from scratch. This has enhanced efficiency and expanded creative possibilities, allowing photographers to push the boundaries of traditional photography.

A Charli XCX photoshoot case study demonstrated the dynamic use of technology, such as an '80s smoke machine and Gaussian scanning for virtual-reality environments, showcasing the innovative potential when generative AI is combined with classic techniques. The panel also addressed the role of AI in the creative process, recognising both its potential and the concerns regarding originality while urging artists to embrace new media. The Icon project, involving computer-generated imagery and avatars, sparked a dialogue about ownership in the digital space, further highlighting AI's role in reshaping creative practices.

The discussion concluded with motivational advice for aspiring creatives, stressing the importance of learning from failures and the relevance of art history in today's technological landscape.



Beyond enhancing marketing strategies, generative AI is revolutionizing the creative process within fashion agencies and marketing teams, ensuring more cohesive and efficient development workflows. This technology is poised to overhaul critical facets of the fashion production cycle, potentially altering everything from trend prediction to creating innovative and realistic designs. New creative tools like Attentive are revolutionizing fashion brands' operations by enabling the creation of multi-channel campaigns based on insights from massive amounts of data. Generative AI tools like Midjourney are also reducing the costs associated with customizing marketing imagery for different regions, surpassing the capabilities of traditional fashion tools. Leveraging extensive unstructured data is revolutionizing video campaigns with hyper-realistic virtual models and immersive 3D designs.

Industry experts underscore the effectiveness of generative AI in refining the analysis of customer behaviours, thereby enhancing the accuracy of trend forecasting. Fashion's power players are embracing generative AI, with 71% of executives reporting smarter, more precise trend predictions fuelled by in-depth analyses of consumer sentiments. Behavioural analysis enhances outreach initiatives, allowing fashion brands to leverage community feedback to personalise marketing content. This advanced behavioural analysis boosts marketing outreach efforts and enables fashion brands to tap into community feedback to

tailor their marketing messages. For instance, Nike's introduction of the Nike Fit app exemplifies how precise sizing can elevate profit margins while curbing return rates⁶.

Collaborations between industry leaders such as IBM and the Fashion Institute of Technology (FIT) are unlocking AI's potential in deciphering fashion data, paving the way for more innovative and focused marketing strategies⁷. IBM and FIT have partnered to leverage IBM's AI for Fashion capabilities, which include a suite of application programming interfaces (APIs) developed and trained for the fashion industry. These APIs leverage deep learning, natural language processing and computer vision to help fashion companies improve customer experience, enhance product design, development and merchandising activities, and augment merchandise performance analysis. The collaboration aims to transform how the fashion industry operates and to build the creative fashion workforce of the future. Through projects that combine coursework with professionally guided learning, FIT students from various disciplines work directly with these APIs, developing new use cases and providing input on end-user functionality and experience.

⁶ Zwięglinska, Z. (2023, July 29). How fashion brands are using generative AI. Glossy. <https://www.glossy.co/fashion/how-generative-ai-will-impact-fashion/>

⁷ IBM and FIT Announce Collaboration to Help Build the Creative Fashion Workforce of the Future. FIT News Room. <https://news.fitnyc.edu/2019/04/24/ibm/>

Keynote Insights

CUTTING THROUGH THE NOISE: HOW TO FOCUS ON VALUABLE TRANSFORMATION

Speaker:

LIZ BACELAR

*Global Tech Innovation Director
The Estée Lauder Companies*

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This keynote presentation emphasised the integration of innovation with business objectives for enterprises of all sizes. Liz Bacelar outlined four pivotal trends in retail fashion innovation:

- **Supply Chain Digital Transformation:** Driven by the EU's Digital Product Passports regulation, this trend emphasizes transparency and sustainability.
- **Innovative Loyalty Programs and NFTs:** With brands like Hugo Boss leading the way, loyalty programs are being tokenized to enhance customer engagement and experience.
- **Consumer Psychographics (Hyper-personalization):** Simply tracking demographics is no longer sufficient; brands must delve deeper into consumer behaviors and preferences.
- **Digital Fashion and Avatars:** An example is Coach running successful campaigns on platforms like Roblox, merging fashion with digital experiences.

Additionally, Liz touched on emerging AI trends in retail, including:

- **AI-Enhanced Analytics**
- **Visual Search and Comments**
- **Automated Customer Service**
- **Inventory Management and Demand Forecasting**
- **Personalized Customer Experience**
- **In-Store Analytics and Operations**

She highlighted the necessity for corporations to cultivate an internal culture of innovation, encouraging collaborations and continual education.

AI's Role and Implications in Fashion Supply Chains

AI isn't just disrupting fashion—it's reinventing the game, bringing value and innovation to every corner of the industry's complex supply chains⁸. Fashion companies are leveraging generative AI to revolutionize logistics, enhancing support functions. Despite the challenges, including the risk of encountering copycat designs, the industry has witnessed groundbreaking advancements. These innovations range from offering personalized return processes to enhancing customer communication channels.

With AI, fashion brands are adeptly navigating the complexities of supply chain challenges, making astute, data-driven decisions based on a real-time grasp of consumer preferences. Generative AI models enhance decision support and recommender systems, optimizing supply chain functionality. From automating processes to reimagining inventory flows, AI is ushering in a new era of efficiency, where robotic precision meets fashion's creative pulse^{9,10}. Real-time AI-powered analytics are revolutionizing market research, enabling brands to develop proactive and competitive strategies swiftly.

Industry trailblazers such as H&M have harnessed AI to revolutionise inventory management. With its acute AI-driven insights into market trends, H&M has drastically reduced overproduction, ensuring its collections are always in demand¹¹. As demonstrated in the JustStyle case study, companies have achieved significant reductions in lead times, cost savings, increased inventory turnover and improved responsiveness. These advancements highlight how AI not only minimises waste and enhances forecasting but also boosts overall efficiency in the fashion supply chain¹².

AI significantly impacts supply chain management, handling purchase requests and operating autonomous vehicles for product shipment. Beyond traditional marketing, generative AI revolutionises online shopping experiences, significantly enhancing consumer sales and revenue analysis. Innovations such as virtual fitting rooms are not merely novel concepts but are transformative, redefining the shopping experience from selection to purchase, thereby increasing sales¹³. Moreover, fashion brands are witnessing the benefits of reduced logistic costs and sustainable practices thanks to precise product delivery strategies that minimise waste. For instance, H&M's AI-driven inventory management system has led to a 15% reduction in overstock and a 10% decrease in stockouts, resulting in a 5% reduction in carbon emissions from reduced waste^{14,15}. Additionally, Nike's introduction of the Nike Fit app has helped reduce returns by 20%, significantly cutting down on waste¹⁶. AI's role extends to sustainability initiatives, where Sneaker Impact has recycled over 15 million pairs of footwear, preventing approximately 12.8 million metric tons of CO2 equivalent from entering the atmosphere¹⁷. These examples highlight AI's profound ability to drive both efficiency and sustainability in the fashion industry.

Conclusion

Generative AI offers many applications within the fashion industry, significantly enhancing value creation and operational efficiency. Adopting AI technology by fashion businesses primarily aims to streamline core activities. As of 2023, the retail industry's commitment to AI technology amounted to an investment of \$5 billion, with projections indicating a surge to above US\$31 billion by 2028¹⁸. This transformative technology not only streamlines essential processes but also addresses critical challenges such as overproduction and unpredictable shifts in seasonal trends, which have far-reaching implications on sales and environmental sustainability.

Incorporating generative AI into decision-making frameworks is pivotal in enhancing customer experiences through refined and insightful analytics. This strategic alignment is expected to catalyze revenue growth by 5-15% and increase return on investment by 10-30%. Although the initial costs of employing generative AI for intricate tasks like design are notable, customer service efficiency benefits lead to significant waste reductions. This, in turn, allows fashion enterprises to bolster their revenue streams and devise forward-thinking strategies to navigate evolving market dynamics and potential disruptions adeptly.

Although generative AI presents substantial risks, enhancing workforce skills ensures its coherent adoption and contributes to sustainable outcomes. By leveraging generative AI, fashion brands can optimize operations, reduce costs, and improve overall efficiency, positioning themselves for long-term success in the fast-paced global market. ●

⁸Harreis H., Koullias T., Roberts R., & Te K. (2023, March 8). Generative AI: Unlocking the future of fashion. McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/generative-ai-unlocking-the-future-of-fashion>

⁹Pereira, A. M., Moura, J. A. B., Costa, E. D. B., Vieira, T., Landim, A. R., Bazaki, E., & Wanick, V. (2022). Customer models for artificial intelligence-based decision support in fashion online retail supply chains. *Decision Support Systems*, 158, 113795.

¹⁰Abdulla, H. (2023, August 31). Leading fashion brands leverage AI for supply chain efficiencies. Just Style. <https://www.just-style.com/news/signal-leading-fashion-brands-leverage-ai-for-supply-chain-efficiencies/?cf-view&cf-closed>

¹¹Nikolopoulos S., & Epifano M., S. (2023). H&M, Zara, Fast Fashion Turn to Artificial Intelligence to Transform the Supply Chain. Thomas. <https://www.thomasnet.com/insights/zara-h-m-fast-fashion-ai-supply-chain/>

¹²Abdulla, H. (31 August 2023). Leading fashion brands leverage AI for supply chain efficiencies. Just Style. <https://www.just-style.com/news/signal-leading-fashion-brands-leverage-ai-for-supply-chain-efficiencies/?cf-view&cf-closed>

¹³Christou L. (16 August 2023). Artificial intelligence in fashion: Reshaping the entire industry. 3DLOOK. <https://3dlook.ai/content-hub/artificial-intelligence-in-fashion/>

¹⁴Emma Cosgrove (14 January 2020) H&M's AI operation helps make its supply chain more sustainable. Supply Chain Dive <https://www.supplychaindive.com/news/HM-AI-supply-chain-sustainable/570400/>

¹⁵Stephanie Nikolopoulos, Melissa Epifano (25 October 2023) H&M, Zara, Fast Fashion Turn to Artificial Intelligence to Transform the Supply Chain. Thomas <https://www.thomasnet.com/insights/zara-h-m-fast-fashion-ai-supply-chain/>

¹⁶<https://www.nike.com/sustainability>

¹⁷<https://sneakerimpact.com/pages/company>

¹⁸World Economic Forum · Here's how artificial intelligence can benefit the retail sector <https://www.weforum.org/stories/2023/01/here-s-how-artificial-intelligence-benefit-retail-sector-davos2023/>

PART II

GENERATIVE AI'S IMPACT ON BEAUTY

The rapid evolution of AI and technology has significantly enhanced work efficiency, customer experiences and product uniqueness. AI is emerging as a disruptive force in the beauty industry, offering tailored skincare recommendations, health assessments and product differentiation. By leveraging big data, beauty brands are overcoming traditional challenges, delivering personalised products and regimens that enhance user experiences and outcomes. This section explores AI's dynamic role in beauty, from transforming skincare and health management to advancing cosmetic science and technology. It also addresses the ethical questions that come with these innovations. The recent surge in AI integration within the beauty market has driven innovation and raised new concerns regarding privacy and fairness.

Additionally, AI streamlines the customer journey, reducing the time and effort needed to find the perfect products while enhancing personalisation. Discussions will also focus on cosmetic science, technology and the ethical considerations that shape the future of the industry. The beauty market is experiencing significant change due to AI integration, leading to new concerns about privacy and fairness.

Real-life Use Cases of AI in Commercial Beauty Applications

The beauty industry is undergoing a transformative shift driven by the integration of AI. This technological revolution is enhancing personalisation and unlocking new commercial opportunities. Leading the charge are beauty giants such as L'Oréal and Procter & Gamble, which are using AI to revolutionise research and development, perfecting both products and customer experiences¹⁹.

A prime example of how AI is steering the concept of beauty toward personalisation is L'Oréal's Modiface app. This application utilises AI and augmented reality to enable users to virtually try on make-up and skincare products from the comfort of their homes. For the price of a cup of coffee, users can upload a picture of their face or take a photo using the app, which then conducts a detailed skin and facial analysis. Based on the results, the app presents a list of recommended products²⁰. Through Modiface, users can experiment with different make-up shades and skincare treatments, allowing them to understand the potential visual outcomes before making a purchase. Additionally, Estée Lauder is also stepping up its game by accelerating product innovation and testing using AI, enabling groundbreaking beauty solutions to reach the market in record time²¹.

AI's influence extends beyond product innovation. According to InsightAce Analytic, brands are developing skincare solutions that respond to stress, incorporating mental health considerations into their offerings. Companies such as Glowify AI utilise expert dermatologist advice and community support, ensuring tailored solutions that enhance customer satisfaction while promoting sustainability by minimising waste. E-retailers and direct-to-consumer brands use AI for personalised responses and recommendations, improving customer interactions and fostering brand loyalty.



¹⁹ Sampo Parkkinen. "Council Post: Advanced AI: The next Frontier in Beauty Technology." Forbes, 12 August 2024. <https://www.forbes.com/councils/forbestechcouncil/2023/11/17/advanced-ai-the-next-frontier-in-beauty-technology/>

²⁰ Collin, Béatrice, and Marie Taillard. Digital Makeover: How L'Oréal Put People First to Build a Beauty Tech Powerhouse. John Wiley & Sons, 2021

²¹ InsightAce Analytic. "AI in Mental Health Market Share, Size, Growth and Forecast to 2031." [www.insightaceanalytic.com, 2024. https://www.insightaceanalytic.com/report/global-ai-in-mental-health-market-/1272](https://www.insightaceanalytic.com,2024.https://www.insightaceanalytic.com/report/global-ai-in-mental-health-market-/1272).

AI and Personalised Beauty Solutions

AI is turning the beauty industry on its head, delivering personalised solutions tailored to individual needs—goodbye one-size-fits-all, hello bespoke beauty²².

Aspect	Traditional Recommendations	AI-personalised Solutions
Approach	Generalised for broad skin types	Highly individualised based on personal data
Customisation	Limited to predefined categories	Tailored to unique skin features and concerns
Product Effectiveness	Results may vary significantly among users	Optimised for specific skin conditions
Adaptability to Environmental Factors	Rarely considered	Adjusts based on climate and environmental changes
User Experience	Minimal personalisation, often trial and error	Immersive, interactive and tailored

Table 1: Comparison of Traditional Beauty Recommendations versus AI-personalised Solutions

AI in Wellness and Health Monitoring for Beauty

Beauty has evolved beyond mere aesthetics, with AI now tracking aspects such as sleep, hydration and overall health, offering insights that extend far beyond what we see in the mirror²³. Apps integrated with wearable devices and health applications provide real-time insights into beauty and health metrics. This technology empowers consumers to make informed decisions about skincare and wellness routines.

Devices such as the Oura Ring are bridging beauty and wellness by monitoring factors such as sleep quality and physical activity, demonstrating how inner health can translate to outer beauty. This tech-driven transformation has led to 57% of users reporting improvements in skin appearance and better rest²⁴. Additionally, AI has underscored the importance of hydration in maintaining skin elasticity and reducing fine lines. Wearable devices can keep track of users' water intake and send reminders to stay hydrated, which enhances skin radiance. AI analysis of data from the Oura Ring has shown a 30% improvement in overall wellness, often reflected in users' beauty and appearance.

Innovations in Cosmetic Product Development with AI

AI is revolutionising the cosmetic manufacturing industry by significantly speeding up research and development (R&D) processes that traditionally consume extensive time and resources. AI enhances the development of beauty products, streamlines testing and promotes sustainable production through robust data analysis.

Moreover, AI is simplifying the complexities of skincare ingredients by predicting their interactions and ensuring that products are safer and more effective. This helps reduce trial and error and minimises the need for human or animal testing²⁵. Advanced modelling techniques allow companies to achieve greater accuracy in identifying allergic reactions, sensitivities and product efficacy.

AI-driven machine learning is transforming the development of sustainable beauty products by refining formulations with precision and reducing environmental impact. Companies such as Procter & Gamble and Estée Lauder have managed to cut product development cycles by nearly 30%, ensuring that quicker, safer and eco-friendly innovations reach the market²⁶. This progress enhances product personalisation, effectiveness and customer satisfaction while addressing the challenges posed by a non-sustainable beauty market.

²²Coelho, Maria Carolina Cordeiro Dias. "AI-driven personalization in beauty retail: exploring how AI-based applications influence customer satisfaction and brand loyalty." PhD diss., 2024.

²³Mangtani, Neelam, Nibha Bajpai, Sangeeta Sahasrabudhe, and Deepak Wasule. "Importance of artificial intelligence and augmented reality in cosmetic and beauty industry post COVID 19." *World Journal of Pharmaceutical Research* 9, no. 8 (2020): 2296-308.

²⁴Raval, Helly Yogeshkumar, Satyen M. Parikh, and Hiral R. Patel. "Self-maintained health surveillance artificial intelligence assistant." In *Handbook of Research on Lifestyle Sustainability and Management Solutions Using AI, Big Data Analytics, and Visualization*, pp. 168-184. IGI Global, 2022.

²⁵Vatwuttipong, Pat, Sirawich Vachmanus, Thanapon Noraset, and Suppawong Tuarob. "Artificial intelligence in cosmetic dermatology: a systematic literature review." *IEEE Access* (2023).

²⁶De Nóbrega, Maria Margarida Durão Pereira. "Beauty Tech: how can Technology Make a Change, Creating a More Consumer Friendly Business Model." Master's thesis, Universidade NOVA de Lisboa (Portugal), 2022.

Aspect	Traditional Methods	AI-powered Innovations
Research Speed	Lengthy, often years to develop new products	Accelerated development, reducing time by 30%
Ingredient Formulation	Manual testing with potential for trial and error	Predictive algorithms for precise formulation
Sustainability	Limited focus on eco-friendly ingredients	AI identifies sustainable, eco-friendly options
Product Testing	Requires physical testing on human skin	Virtual simulations reduce the need for physical testing
Consumer Customisation	Broadly formulated products	Tailored solutions based on user data

Table 2: Benefits of AI in Cosmetic Product Development

Ethical Considerations and Challenges in AI-Driven Beauty

The advent of AI-based beauty applications has revolutionised beauty personalisation and product innovation. However, these advancements come with significant ethical implications. As AI technologies collect extensive personal data—ranging from facial scans to biometric insights—privacy issues become more pronounced. If this data is not adequately protected, it could be misused, resulting in serious breaches of personal privacy.

Beneath the appealing surface of AI lies a critical challenge: algorithmic bias in machine learning models. This growing concern requires urgent attention as we pursue technologically driven perfection. These biases often arise from training AI on datasets that lack diversity in skin tones and facial features, which can perpetuate idealised or culturally specific beauty standards. Consequently, this may marginalise certain consumer groups and reinforce harmful stereotypes.

Addressing these ethical issues is essential as AI continues to evolve in the beauty industry. Implementing strong data protection measures and promoting diversity in AI-training datasets will help create a more inclusive and respectful beauty ecosystem. By confronting these challenges directly, the industry can leverage AI's full potential while safeguarding consumer privacy and fostering fairness.

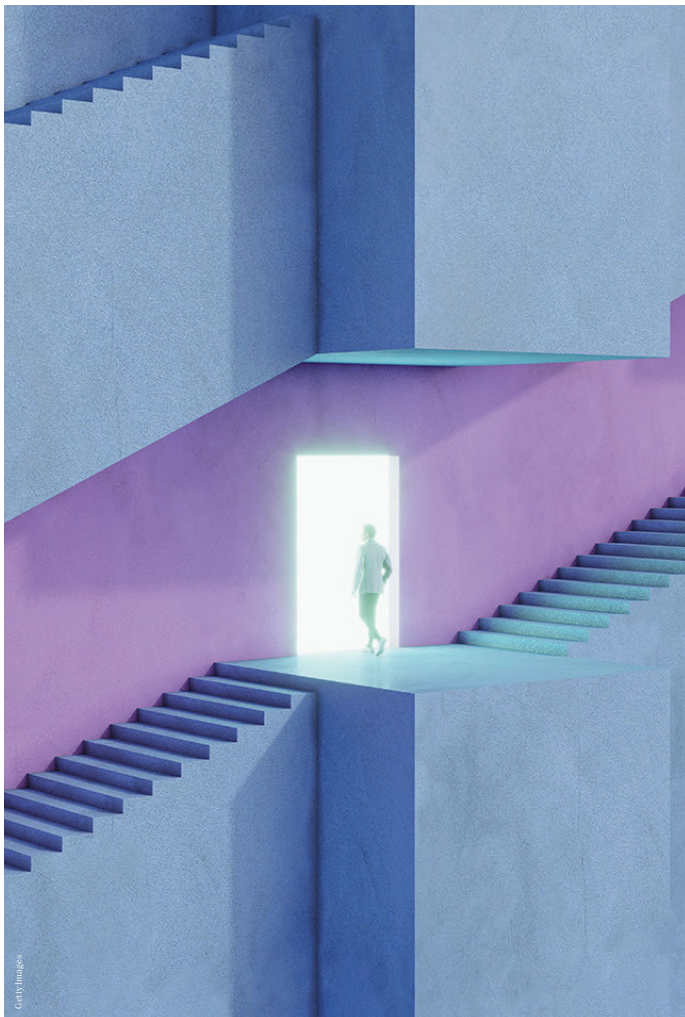
Conclusion

AI is transforming the beauty industry by offering innovative solutions, enhancing product development and identifying the health-related aspects of beauty. It leverages extensive datasets to refine beauty regimens, formulate products and swiftly meet consumer needs. However, the rapid integration of AI also raises significant ethical concerns, particularly regarding data protection and the potential for biased algorithmic programming.

These challenges must be tackled head-on for AI-driven beauty to thrive while protecting consumer privacy. As AI grows in importance, it is expected to play a crucial role in health restoration, nutritional supplements and beauty treatments. By tackling these ethical challenges, the industry can fully harness AI's potential while safeguarding consumer interests. ●

PART III

AI'S INFLUENCE IN CREATIVE LIFESTYLES *(Art, Architecture & Culinary)*



AI is seamlessly woven into the fabric of everyday life, transforming everything from how we create art and design cities to how we eat and move through the world. It's revolutionising daily routines with a finesse that touches everything from our morning commute to the curated experiences of urban living²⁷. All industries increasingly leverage AI technologies, exemplified by the widespread adoption of facial recognition in smartphones for enhanced security features. AI tools are redefining creativity and bringing fresh perspectives to art, architecture and food. In the culinary world, it's shaping how we think about nutrition and wellness, offering a new vision for the future²⁸.

This section examines AI's critical role in transforming key lifestyle elements. It explores real-world applications and commercial activities to highlight AI's current significance. Understanding the implications of enhanced creativity through AI is essential for personalising dietary preferences and promoting sustainable urban development.

AI's Transformative Impact on Art

AI is reshaping the art world with profound implications for creativity and expression. Artists are increasingly utilising generative AI to automate complex aspects of traditional processes, redefining what we understand as creativity in this innovative era²⁹. By integrating tools such as generative AI, artists can find inspiration that results in innovative public art displays and a global representation of the harmonious relationship between human and machine intelligence.

Studies from MIT highlight how generative AI is reshaping art conceptualisation and production, fundamentally redefining creativity. Artist Refik Anadol leverages generative AI tools such as DALL-E and ChatGPT to merge digital creativity with traditional art forms, reinventing creative expression. Anadol's projects, such as 'Machine Hallucinations', explore the intersection of data and art, creating immersive experiences that challenge traditional notions of art³⁰. Generative AI is being used to create personalised art experiences, interactive installations and data-driven projects. For instance, Anadol's 'Large Nature Model' is an open-source AI model dedicated to nature, showcasing the potential of AI to create environmentally conscious art. These applications not only enhance artistic creativity but also raise awareness about important issues such as natural ecosystem conservation.

Yet, the rise of AI-generated art also brings moral concerns, particularly about the authenticity of such works due to the heavy recombination of existing content³¹. While AI opens new avenues to overcome creative limitations, it also presents significant challenges in defining its role in human artistic potential.

²⁷Elrick R., E. (2022). 10 impacts of artificial intelligence on our everyday life | liberties.eu. Liberties.eu. <https://www.liberties.eu/en/stories/impact-of-artificial-intelligence-in-everyday-life/44222>

²⁸Ucdavis.edu. (2024). Artificial intelligence for food and health white paper January 2024. UC Davis Innovation Institute for Food and Health. <https://foodandhealth.ucdavis.edu/wp-content/uploads/2024/04/Artificial-Intelligence-for-Food-and-Health-1.pdf>

²⁹Robertson, A. (13 September 2024). Don't ask if AI can make art — ask how AI can be art. The Verge. <https://www.theverge.com/2024/9/13/24241189/generative-ai-interactivity-art>

³⁰Winn, Z. (2023). If art is how we express our humanity, where does AI fit in? MIT News | Massachusetts Institute of Technology. <https://news.mit.edu/2023/generative-ai-art-expression-0615>

³¹Robertson, A. (13 September 2024). Don't ask if AI can make art — ask how AI can be art. The Verge. <https://www.theverge.com/2024/9/13/24241189/generative-ai-interactivity-art>



Panel Insights

THE AI REVOLUTION: HUMAN CREATIVITY MEETS ARTIFICIAL INTELLIGENCE

Speakers:

KRISTA KIM

Artist and Tech Founder

CYRIL FOIRET

Founder, Maison Meta

Moderated by:

DEBRA LANGLEY

Partner, CAPTIS Ventures

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This panel featured insightful contributions centring on the transformative influence of AI on art and creativity. The panellists examined the rapid evolution of AI technology, noting that its capabilities are doubling approximately every six months, and emphasised how AI can significantly enhance creative processes across design and artistic expression. Kim underscored the vital importance of data sovereignty, advocating for individuals to own and control their data to ensure ethical AI usage. She also called for greater female representation in the AI field, highlighting the benefits of inclusion and collaboration. Foiret encouraged an open-minded approach, urging designers to explore a variety of AI tools and maintain adaptability in their workflows.

The discussion also addressed the anticipated rise of artificial general intelligence, emphasising the necessity for personal AI guardians to protect privacy and data. Such advancements could enable AI to manage routine tasks, allowing humans to focus on creative pursuits. The panel showcased innovative applications of AI, including AI-curated fashion shows and immersive art installations. It concluded with a strong call to action for designers to embrace AI as a valuable tool, uphold data privacy standards and advocate for regulatory measures in the development of AI technologies.

AI's Role in Architectural Innovation

AI-driven designs transcend traditional architectural methods regarding efficiency, agility and sustainability. The integration of AI in architecture marks significant advancements by enabling predictive processes that optimise human and physical resources and budget allocations to ensure streamlined construction processes³². Deploying AI in architectural production facilitates rapid scalability in commercial operations, leading to increased productivity in real estate development.

Architectural firms investing in AI technology prioritise design automation to reduce workforce involvement in repetitive tasks, allowing a greater focus on problem-solving and creative pursuits. Cities such as Dublin and Singapore are implementing AI to design and enhance digital replicas and other architectural projects, leveraging AI-driven solutions to promote sustainability through future event and trend analysis³³.

In urban planning, AI tools are shaping infrastructures that respond to human and environmental needs. While these technology-enhanced designs provide a glimpse into future cities, human oversight remains essential to ensure their functionality. The future of architecture depends on the collaboration between human vision and automated precision, ensuring that innovation remains purposeful.

The existing impact of AI on architecture underscores the significance of maintaining a clear intersection between human intent and technological innovation. As AI continues to adapt to human thinking patterns, stakeholders, politicians and civil society must retain control over critical decisions to ensure mutual benefits.

AI's Influence on Culinary Arts & Food

Integrating AI into food preparation and consumption significantly enhances individual meal planning and personal preference recommendations. The food industry is savouring AI's impact, with the global AI in food and beverages market size valued at USD 8.45 billion in 2023 and projected to grow at a CAGR of 39.1% from 2024 to 2030. AI is revolutionising the food and beverages industry by enhancing efficiency and automation in processing, sorting, and packaging, thereby reducing errors and meeting global food demands³⁴. Increased scientific reporting on dietary choices and environmental implications, including food-related disorders, has increased reliance on AI recommendations to remodel food systems.

In industrial settings, AI models are predominantly implemented through intelligent monitoring and computer vision systems, which optimise resource allocation and enhance food safety. Take the AI-driven Horizon Scanning Methodology, for example, which pinpoints aflatoxin sources to minimise contamination³⁵. Similarly, Western Growers' GreenLink initiative showcases AI's power in reducing pathogen risks in leafy greens, paving the way for a safer, more traceable food system.



AI's personalised guidance is proving crucial in helping people adhere to their diets. This advancement in technology represents a significant moment in the food industry, where customised nutrition is becoming the standard. Personalised meal plans, guided by AI, are tailored to individual health needs and preferences, ensuring more effective and enjoyable dietary experiences³⁶. Companies such as Nutrino and Foodvisor utilise AI to provide real-time dietary advice, helping users make healthier food choices based on their unique health profiles.

Additionally, AI is enhancing the culinary arts by assisting in the creation of new recipes and flavour profiles. AI-powered tools, such as IBM's Chef Watson, analyse thousands of recipes and flavour combinations to suggest innovative dishes that might not have been conceived by human chefs alone. This broadens culinary horizons and introduces new and exciting dining experiences for consumers.

AI also plays a significant role in agriculture and food production by using predictive analytics to help farmers make informed decisions regarding crop planting, watering and harvesting. Companies such as PrecisionHawk leverage AI to analyse data from drones and satellites, providing farmers with actionable insights that increase yield and reduce waste. This integration of AI in agriculture contributes to a more sustainable and efficient food supply chain.

Additionally, AI is transforming food delivery services. Algorithms analyse data to predict customer preferences, optimise delivery routes and manage inventory, ensuring customers receive their food quickly and efficiently. Companies such as DoorDash and Uber Eats are utilising AI to streamline their operations and enhance customer satisfaction.

Conclusion

AI's influence on industries such as art, architecture and food pushes boundaries, enriches personal choices and sparks fresh inspiration. In the arts, it's introducing a creative style that merges machine learning with human innovation. The architectural industry is transforming with predictive visualisation and enhanced models promoting sustainability. Similarly, the food industry has seen substantial improvements in reducing supply chain delays and mitigating contamination risks, thus advancing public health.

These examples collectively demonstrate the immense potential of AI to enhance creative industries. They also highlight the importance of ethical considerations, inclusivity and the need for continuous adaptation. As AI evolves, it is crucial to find a balance between technological advancements and the preservation of human-centred values, ensuring that innovation remains both meaningful and responsible. ●

³² Valencia, N. (6 December 2023). The impact of AI tools on architecture in 2024 (and beyond). ArchDaily. <https://www.archdaily.com/1009545/the-impact-of-ai-tools-on-architecture-in-2024-and-beyond>

³³ Valencia, N. (6 December 2023). The impact of AI tools on architecture in 2024 (and beyond). ArchDaily. <https://www.archdaily.com/1009545/the-impact-of-ai-tools-on-architecture-in-2024-and-beyond>

³⁴ Grand View Research - AI in Food & Beverages Market Trends. <https://www.grandviewresearch.com/industry-analysis/ai-food-beverages-market-report>

³⁵ Ucdavis.edu. (2024). Artificial intelligence for food and health white paper January 2024. UC Davis Innovation Institute for Food and Health. <https://foodandhealth.ucdavis.edu/wp-content/uploads/2024/04/Artificial-Intelligence-for-Food-and-Health-1.pdf>

³⁶ Team EMB. (18 March 2024). AI in personalized nutrition and diet: Transforming the way you eat. EMB Blogs. <https://blog.emb.global/role-of-ai-in-personalized-nutrition-and-diet/>

PART IV

CHALLENGES IN AI:

Operational, Ethical & Sustainability Dilemmas

1. Ethical Issues in AI for Fashion

1.1 Data Privacy and Security in the Age of AI

AI in fashion relies heavily on extensive datasets to provide predictive insights on market trends and optimise supply chains. In a time of rapid digital evolution, safeguarding data privacy is essential for building consumer trust and preventing unauthorised access to sensitive information. Strong data privacy measures are crucial to counter AI's inherent risks, from data breaches to the misuse of personal information³⁷.

To tackle data security challenges effectively, organisations must proactively adhere to regulations such as the EU's General Data Protection Regulation (GDPR), which outlines the need for clear and explicit consent when using personal data in AI models to safeguard such data through thoughtful collection, careful



³⁷Arrigo, L. (September 2024). Navigating the ethical considerations of AI in the fashion industry/.aimodelagency.com. <https://aimodelagency.com/navigating-the-ethical-considerations-of-ai-in-the-fashion-industry/>

³⁸What are the ethical implications of using AI in fashion design in 2024? (n.d.). blog.stateless.nyc. <https://blog.stateless.nyc/what-are-the-ethical-implications-of-using-ai-in-fashion-design-in-2024/>

³⁹McIntosh D. M., Suzuki G. S., Schaal Y., L. (2024). AI and the Copyright Liability Overhang: A Brief Summary of the Current State of AI-Related Copyright Litigation. www.ropesgray.com. <https://www.ropesgray.com/en/insights/alerts/2024/04/ai-and-the-copyright-liability-overhang-a-brief-summary-of-the-current-state-of-ai-related>

⁴⁰Roos, J. (2023). Artificial Intelligence: Copyright & Consequences

⁴¹How Singapore's FinTech Regulatory Sandbox is helping fintech innovators accelerate time to market <https://www.edb.gov.sg/en/business-insights/insights/how-singapore-s-fintech-regulatory-sandbox-is-helping-fintech-innovators-accelerate-time-to-market.html>

⁴²EMA offers a regulatory sandbox for companies to test new products and services in a 'safe space'. <https://www.ema.gov.sg/regulations-licences/regulations/policies-frameworks/regulatory-sandbox>

⁴³Overall, P. (10 October 2024). How to balance AI-driven efficiency with people-centred retail innovation. Retail Bulletin | Daily UK Retail News. <https://www.theretailbulletin.com/retail-solutions/how-to-balance-ai-driven-efficiency-with-people-centred-retail-innovation-07-10-2024/>

⁴⁴Bateni, A., Chan, M. C., & Eitel-Porter, R. (2022). AI fairness: from principles to practice.

⁴⁵Lawton, G. (2024). AI transparency: What is it and why do we need it? CIO. <https://www.techtarget.com/searchcio/tip/AI-transparency-What-is-it-and-why-do-we-need-it>

processing and secure storage³⁸. For brands, transparency in data practices isn't just a matter of ethics—it's vital for protecting their reputation and avoiding the legal fallout of non-compliance. In today's landscape, being transparent about how data is handled has become a hallmark of trust and integrity.

1.2 Navigating Copyright and Intellectual Property with AI

Most AI developers rely on copyrighted materials for training models. The use of these materials spans both training datasets and final outputs, raising legal uncertainties about intellectual property rights, particularly in unsupervised AI applications like those in the US³⁹. Using copyrighted works to train AI models can produce outputs that resemble original creations—essentially unauthorised derivatives—which may require compensation for the original authors and copyright holders. Regulatory frameworks, such as fair use in the US, are in place to address these issues, striving to balance innovation with the responsible use of existing creative material⁴⁰. In addition, the EU's AI Act categorises AI systems based on their risk levels, ranging from unacceptable to minimal.

To advance the originality of AI-generated designs, it is essential to introduce regulatory sandboxes that allow copyright holders to opt out and implement updated licensing schemes. For instance, Singapore has implemented regulatory sandboxes, such as the Monetary Authority of Singapore's FinTech Regulatory Sandbox and the Energy Market Authority's sandbox for energy innovations^{41,42}. These sandboxes enable companies to test new AI-driven products and services in a controlled environment, providing regulatory clarity, fostering innovation and ensuring consumer protection.

1.3 Addressing Bias and Fairness in AI Algorithms

Bias in AI algorithms can compromise both accuracy and fairness in outcomes. For brands using predictive analytics, skewed results often stem from overgeneralised data⁴³. Mitigating algorithmic biases requires regular monitoring and meticulous data curation to ensure fair and inclusive results. To combat this, continuous monitoring and careful data curation are essential to ensuring inclusivity. By prioritising diverse model training and sourcing, brands can better reflect the richness of individual and cultural identities, reducing the risk of demographic bias⁴⁴. Addressing potential biases enhances the relevance and effectiveness of AI-based solutions, particularly in the fashion industry.

1.4 Ensuring Transparency and Accountability in AI Operations

Transparency in AI models enhances the credibility of AI-driven decisions, reflecting critical principles of accountability and governance. It's essential for unravelling the inner workings of these systems, ensuring their actions are both understood and trusted⁴⁵. AI developers must adopt clear guidelines to address stakeholders' and consumers' concerns about unfair treatment and potential biases. Ongoing feedback and timely interventions are vital to upholding accountability in AI systems, ensuring they operate ethically and deliver trusted results.



Panel Insights

FRIEND OR FOE: THE ETHICS OF AI IN CREATIVE INDUSTRIES

Speakers:

DEEPS DE SILVA

Founder of Samadhi Ventures

DUNCAN BASS

Curator & Art Historian, Singapore Art Museum

IMMANUEL KOH

*Assistant Professor,
Singapore University of
Technology and Design (SUTD)*

KRISTA KIM

Artist and Tech Founder

Moderated by:

JESSICA CHAPFLOW

Founder, Heartificial Intelligence

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The panel brought together artists, AI practitioners and academics to explore the ethics of AI in creative industries. Critical discussions highlighted the moral implications surrounding data privacy and creative ownership, acknowledging a gap in creative involvement in AI ethics. The panellists examined the application of AI in architecture and education, emphasising ethical obligations within design. Kim proposed innovative concepts for personal offline AI models to safeguard data privacy while advocating for human-

centred design principles. The conversation also addressed the balance between AI's commercial interests and its potential as a public good, alongside concerns regarding corporate ownership, explicitly regarding OpenAI and Microsoft. Additionally, the importance of intellectual property protection was underscored with proposals for integrating AI and blockchain technologies to enhance the management of intellectual property and licensing for creators.

2. Operational Challenges in AI

2.1 Effective Data Management Practices

Mastering data management requires a meticulous approach to both collection and processing. With vast datasets, brands have to adopt advanced strategies to uphold the integrity of AI models and consistently achieve refined results⁴⁶. The internal workforce must understand the technical aspects of AI model development to ensure sustainable and competitive advantages. Contextualising AI models from prototypes to real applications ensures data quality and relevance by highlighting potential loopholes⁴⁷.

2.2 Seamless Integration with Existing Systems

Implementing AI at an industry-wide scale introduces layers of complexity. The transition from concept to practical application often encounters obstacles, particularly when AI clashes with existing legacy systems⁴⁸. Many fashion and e-commerce brands achieve better operational outcomes by integrating AI to simplify complex customer scenarios, particularly in real-time analytics. While embedding AI models into existing business systems presents challenges, developers should ensure compatibility to maintain seamless operations and minimise disruption.

2.3 Cost and Resource Allocation Strategies

Adopting AI systems comes with considerable costs, often slowing down implementation. While AI optimises load management and streamlines routes, building and deploying large-scale models brings challenges, from limited resources to compromised training quality—all of which can impact the customer experience⁴⁹. Additional hurdles include the complexity of unifying available resources, such as human expertise and financial provisions. A lack of adequate resources often results in AI project failures or unsustainable operations and deployment issues.

2.4 Meeting Skill and Expertise Requirements

The AI revolution ushers in an era of advanced computing and a higher demand for specialised professionals, especially within the fashion industry. The creative sector, traditionally slower to adopt technological advancements compared to other industries, now faces an urgent need to upskill its workforce. The demand for specialised skills in AI and data science presents challenges as increased competition necessitates the enhancement of internal capabilities to reduce biases and errors⁵⁰. Many fashion organisations are adopting practical approaches to supplementing skilled professionals for AI models, including comprehensive training and development programmes for existing staff. Regular workshops are essential in making the fashion workforce tech-savvy and keeping them up to date on emerging AI applications and industry trends. By bridging the skill gap, the fashion industry can effectively leverage AI to drive innovation and maintain a competitive edge.

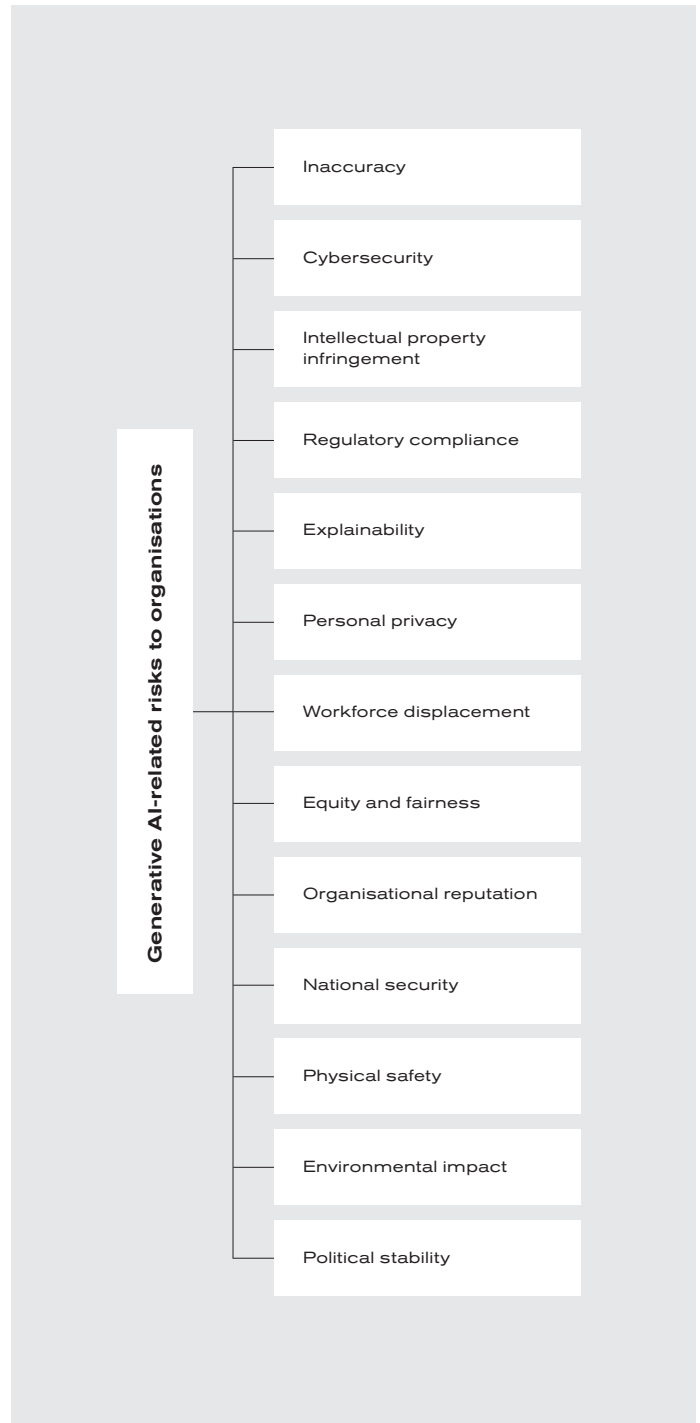


Figure 5: Generative-AI-related risks⁵¹

⁴⁶Henderson, B. H. (1 October 2024). 2 years of generative AI in business: Transformation, new risks. CMSWire.com. <https://www.cmswire.com/customer-experience/2-years-of-generative-ai-in-business-whats-changed/>

⁴⁷Arrigo, L. (September 2024). Navigating-the-ethical-considerations-of-ai-in-the-fashion-industry/. aimodelagency.com. <https://aimodelagency.com/navigating-the-ethical-considerations-of-ai-in-the-fashion-industry/>

⁴⁸Henderson, B. H. (1 October 2024). 2 years of generative AI in business: Transformation, new risks. CMSWire.com. <https://www.cmswire.com/customer-experience/2-years-of-generative-ai-in-business-whats-changed/>

⁴⁹Overall, P. (10 October 2024). How to balance AI-driven efficiency with people-centred retail innovation. Retail Bulletin | Daily UK Retail News. <https://www.theretailbulletin.com/retail-solutions/how-to-balance-ai-driven-efficiency-with-people-centred-retail-innovation-07-10-2024/>

⁵⁰Lawton, G. (2024). AI transparency: What is it and why do we need it? CIO. <https://www.techtarget.com/searchcio/tip/AI-transparency-What-is-it-and-why-do-we-need-it>

⁵¹What's the future of generative AI? An early view in 15 charts. (25 August 2023). McKinsey & Company. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-generative-ai-an-early-view-in-15-charts>

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Keynote Insights

‘ME, MYSELF, MY AVATAR’

Speaker:

LEANNE ELLIOTT YOUNG

CEO & Co-Founder,
Institute of Digital Fashion (IoDF)

[WATCH HERE](#)

In her presentation, Young highlighted the lack of diversity in the digital fashion space, revealing that a staggering 60% of fashion campaigns fail to provide adequate representation. The IoDF stands at the forefront of change, demonstrating a strong commitment to diversity and inclusion within the fashion industry through impactful partnerships with major platforms such as TikTok and Meta. She also advocated for a future where fashion is not only

inclusive but also accessible to everyone. By showcasing pioneering digital avatars—such as the world’s first non-binary and pregnant avatars—they illustrated how technological advancements can drive meaningful change. Moreover, her presentation emphasised the critical importance of collaboration, drawing insights from a focus group of more than 6,000 participants that underscored the urgent demand for greater representation in digital spaces.

3. Sustainability Challenges in AI

While AI brings remarkable efficiencies and innovations to the fashion industry, it also presents its own set of sustainability challenges. AI technologies, especially those involving large-scale data processing and machine learning, are energy-intensive and contribute to significant carbon emissions. Data centres powering AI operations require substantial electricity, often sourced from non-renewable energy, leading to increased environmental impact.

For instance, training deep learning models can consume as much energy as five cars over their lifetimes, including manufacturing⁵². Moreover, the continuous operation of AI-driven systems further increases energy consumption. As the fashion industry increasingly adopts AI to reduce waste and enhance sustainability, it is crucial to address the environmental footprint of AI technology itself.

Efforts to mitigate these challenges include investing in energy-efficient hardware, optimising algorithms to reduce computational requirements and sourcing energy from renewable resources⁵³. By acknowledging and addressing the sustainability challenges of AI, the fashion industry can strive for a balanced approach that leverages AI's benefits while minimising its environmental impact.

4. Learning from AI Challenges and Failures

Many AI system failures originate during the early stages of development, such as when models are trained with limited and incomplete datasets. A striking example is Amazon's overreliance on AI to support smaller startups, which are particularly vulnerable to economic shifts due to limited resources⁵⁴. This situation underscored the need for sustainable business models with adequate investment to support AI applications effectively.

Another instance was Amazon's deployment of an AI recruiting tool, which exhibited significant bias against female candidates⁵⁵. While companies such as LinkedIn leverage AI to streamline the hiring process, Amazon's case highlighted the necessity of updating training data to prevent overrepresentation of a particular gender. Despite AI's potential, e-commerce brands like Amazon must ensure equitable data sourcing and representation to minimise biased AI responses and decision-making⁵⁶. Regular updates, equitable dataset representation and implementing bias detection procedures are critical for improving the functionality of AI systems and the quality of their outcomes.

Conclusion

The challenges surrounding AI in the fashion industry highlight the importance of responsible deployment. Prioritising data privacy and security is essential for maintaining consumer trust and adhering to regulations such as GDPR to safeguard personal information and ensure transparency. Navigating copyright and intellectual property rights requires balancing innovation with respect for existing creative works. Updating licensing schemes and regulatory frameworks can reduce legal uncertainties and promote originality in AI-generated designs. To combat bias and ensure fairness in AI algorithms, continuous monitoring and diverse data sourcing are crucial for reflecting the richness of cultural identities.

Addressing operational challenges, such as data management and resource allocation, is key to optimising AI deployment alongside investing in skill development. Learning from past failures, such as those at Amazon, emphasises the importance of equitable data sourcing and regular system updates to minimise biases. Ethical considerations, transparency and accountability in AI practices are vital for upholding consumer trust.

Integrating AI with blockchain can improve intellectual property management and foster an equitable digital landscape. As the fashion industry continues to innovate with AI, it must prioritise ethical practices, transparency and collaboration to navigate operational and ethical challenges. This approach will enable the industry to harness AI's full potential while safeguarding consumer trust and promoting sustainable growth. ●

⁵² Artificial intelligence and sustainability in the fashion industry: a review from 2010 to 2022 <https://link.springer.com/article/10.1007/s42452-023-05587-2>

⁵³ Artificial intelligence in fashion – the risks, the rewards, and the responsibilities <https://www.theinterline.com/2024/09/25/artificial-intelligence-in-fashion-%E2%88%92-the-risks-the-rewards-and-the-responsibilities/>

⁵⁴ Zen Analyst. (May 2023). Amazon's AI Ambitions: Unpacking The Potential Rewards And Risks. Seeking Alpha | Stock Market Analysis & Tools for Investors. <https://seekingalpha.com/article/4603090-amazons-ai-ambitions-unpacking-the-potential-rewards-and-risks>

⁵⁵ Vincent, J. (10 October 2018). Amazon reportedly scraps internal AI recruiting tool that was biased against women. The Verge. <https://www.theverge.com/2018/10/10/17958784/ai-recruiting-tool-bias-amazon-report>

⁵⁶ Vincent, J. (10 October 2018). Amazon reportedly scraps internal AI recruiting tool that was biased against women. The Verge. <https://www.theverge.com/2018/10/10/17958784/ai-recruiting-tool-bias-amazon-report>

PART V

FUTURE DIRECTIONS AND RECOMMENDATIONS

Emerging Trends in AI for Fashion

The latest AI innovations are designed to tackle challenges affecting both production and service delivery efficiency. As AI continues to evolve, it has enabled personalised experiences, offering customers tailored recommendations based on their past purchases and personal preferences⁵⁷. Hyper-personalised marketing messages provide a competitive edge in a fluctuating market. Additional trends include supply chain integration to minimise waste and ensure optimal product distribution⁵⁸. As AI technology continues to advance, it enables personalised shopping experiences by offering customers tailored recommendations based on their past purchases and individual preferences. Hyper-personalised marketing strategies provide brands with a competitive edge in a fluctuating market. Other notable trends include the integration of supply chains to minimise waste and optimise product distribution.



⁵⁷Henderson, B. H. (1 October 2024). 2 years of generative AI in business: Transformation, new risks. CMSWire.com. <https://www.cmswire.com/customer-experience/2-years-of-generative-ai-in-business-whats-changed/>

⁵⁸What's the future of generative AI? An early view in 15 charts. (25 August 2023). McKinsey & Company. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-generative-ai-an-early-view-in-15-charts>

Significant Future Applications of AI in Fashion:

- **Virtual Try-ons:** AI-powered virtual try-on technology simplifies the return process by allowing customers to visualise how clothes and accessories will look on them without needing physical fittings. This enhances customer satisfaction and reduces waste.
- **AI-augmented Design Frameworks:** Designers are leveraging AI to create unique visuals for new fashion trends. These frameworks support innovation while ensuring that the final designs reflect human creativity and validation.
- **Sustainability and Circular Fashion:** AI is promoting sustainable practices in the fashion industry by optimising resource usage and encouraging circular fashion models. Predictive analytics improve inventory management, reducing overproduction and waste.
- **Enhanced Customer Engagement:** AI is helping brands create immersive and interactive experiences for customers. AI-powered chatbots and virtual assistants provide instant support, enhancing engagement and satisfaction.
- **Advanced Trend Forecasting:** AI algorithms analyse large volumes of data from social media, fashion shows and retail trends to predict upcoming styles. This helps brands stay ahead and adapt their collections accordingly.
- **Smart Textiles and Wearable Technology:** AI is increasingly integrated into smart textiles and wearable devices, offering functionalities such as health monitoring and adaptive fashion that responds to environmental changes or user preferences.
- **Blockchain Integration for Transparency:** Combining AI with blockchain technology ensures transparency and traceability in the fashion supply chain. This integration helps verify product authenticity and maintain ethical standards.
- **AI in Visual Merchandising:** AI-powered visual merchandising tools assist retailers in creating attractive store layouts and product displays. By analysing customer behaviour and preferences, these tools enhance the shopping experience and drive sales.

- **Voice and Visual Search:** AI-driven voice and visual search functionalities allow customers to find products more intuitively. These technologies improve the shopping experience by delivering quick and accurate search results based on user input.



Best Practices for Ethical AI Use

Responsible AI implementation hinges on two primary principles: transparency and fairness. As AI integration grows, transparency becomes essential, allowing users to grasp fully how these systems function within specific contexts. Fairness involves creating coherent AI systems that promote equal treatment and address potential biases to maintain operational efficiency. Ethical challenges in AI call for regular audits to keep performance at its best³⁷. AI systems require continuous assessment to maintain efficiency, with human oversight for specific tasks when necessary. Involving stakeholders during model development, adhering to GDPR standards and maintaining transparency are vital for the ethical use of AI systems.

To harness the full potential of AI while ensuring ethical practices, the fashion industry should:

- **Prioritise Data Privacy and Security:** Implement robust data privacy measures to protect consumer information and build trust.
- **Promote Inclusivity and Diversity:** Ensure diverse representation in AI training data to minimise biases and enhance the relevance of AI solutions.
- **Adopt Transparent Practices:** Maintain transparency in AI operations, clearly communicating how data is used and decisions are made.
- **Engage in Continuous Learning:** Encourage ongoing education and training for employees to stay updated with emerging AI technologies and trends.
- **Implement Regulatory Compliance:** Adhere to regulatory frameworks and ethical guidelines to ensure responsible AI deployment.
- **Foster Collaboration:** Promote collaboration between AI developers, fashion designers and other stakeholders to create innovative and ethical AI solutions.

By embracing these trends and recommendations, the fashion industry can leverage AI to drive innovation, enhance customer experiences and promote sustainable practices. ●



³⁷Overall, P. (10 October 2024). How to balance AI-driven efficiency with people-centred retail innovation. Retail Bulletin | Daily UK Retail News. <https://www.theretailbulletin.com/retail-solutions/how-to-balance-ai-driven-efficiency-with-people-centred-retail-innovation-07-10-2024/>



Anne Yitzhakov
Managing Director, Cartier Singapore,
ASEAN & Malaysia



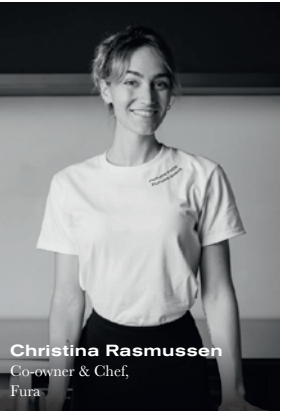
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Creative Director



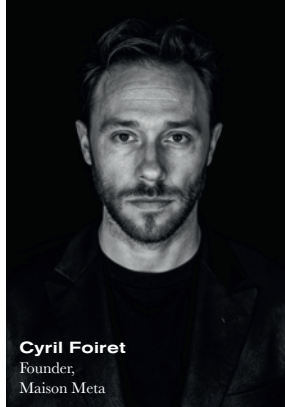
Chandreyee Ray
Associate Lifestyle Editor,
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Chet Lo
Founder,
Chet Lo



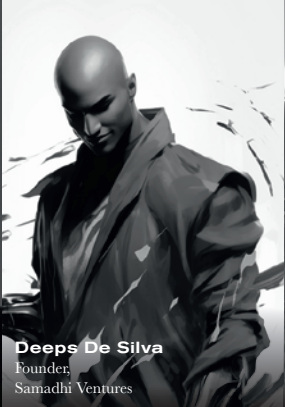
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Co-owner & Chef,
Fura



Cyril Foiret
Founder,
Maison Meta



Debra Langley
Partner,
CAPTIS Ventures



Deeps De Silva
Founder,
Samadhi Ventures



Denise Teo Jia Qi
Live Streamer, Educator,
Community Builder



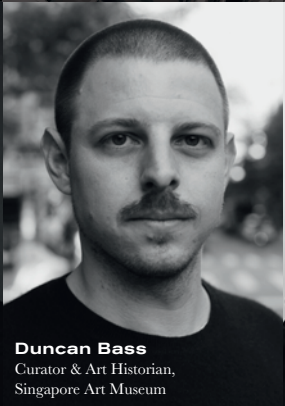
Desmond Lim
Editor-in-Chief,
Vogue Singapore



Dr Audrey Gueniche
Scientific Director,
Helena Rubinstein



Dr Stephanie Ho
Consultant Dermatologist



Duncan Bass
Curator & Art Historian,
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Chef-owner,
Restaurant Fiz



Immanuel Koh
Assistant Professor, Singapore University
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World Economic Forum · Here's how artificial intelligence can benefit the retail sector <https://www.weforum.org/stories/2023/01/here-s-how-artificial-intelligence-benefit-retail-sector-davos2023/>

Harreis H., Koullias T., Roberts R., & Te K. (8 March 2023). Generative AI: Unlocking the future of fashion. McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/generative-ai-unlocking-the-future-of-fashion>

LLaMA: Open and Efficient Foundation Language Models: <https://arxiv.org/abs/2302.13971>

(Islam et al., 2024). Islam, T., Miron, A., Nandy, M., Choudrie, J., Liu, X., & Li, Y. (2024). Transforming Digital Marketing with Generative AI. *Computers*, 13(7), 168.

Zwieglinska, Z. (29 July 2023). How fashion brands are using generative AI. *Glossy*. <https://www.glossy.co/fashion/how-generative-ai-will-impact-fashion/>

IBM and FIT Announce Collaboration to Help Build the Creative Fashion Workforce of the Future.

FIT News Room. <https://news.fitnyc.edu/2019/04/24/ibm/>

Pereira, A. M., Moura, J. A. B., Costa, E. D. B., Vieira, T., Landim, A. R., Bazaki, E., & Wanick, V. (2022). Customer models for artificial intelligence-based decision support in fashion online retail supply chains. *Decision Support Systems*, 158, 113795.

Abdulla, H. (31 August 2023). Leading fashion brands leverage AI for supply chain efficiencies. *Just Style*. <https://www.just-style.com/news/signal-leading-fashion-brands-leverage-ai-for-supply-chain-efficiencies/?cf-view&cf-closed>

Nikolopoulos S., & Epifano M. S. (2023). H&M, Zara, Fast Fashion Turn to Artificial Intelligence to Transform the Supply Chain. *Thomas*. <https://www.thomasnet.com/insights/zara-h-m-fast-fashion-ai-supply-chain/>

Abdulla, H. (31 August 2023). Leading fashion brands leverage AI for supply chain efficiencies. *Just Style*. <https://www.just-style.com/news/signal-leading-fashion-brands-leverage-ai-for-supply-chain-efficiencies/?cf-view&cf-closed>

Christou L. (16 August 2023). Artificial intelligence in fashion: Reshaping the entire industry. *3DLOOK*. <https://3dlook.ai/content-hub/artificial-intelligence-in-fashion/>

Emma Cosgrove (14 January 2020) H&M's AI operation helps make its supply chain more sustainable. *Supply Chain Dive* <https://www.supplychaindive.com/news/HM-AI-supply-chain-sustainable/570400/>

Stephanie Nikolopoulos, Melissa Epifano (25 October 2023) H&M, Zara, Fast Fashion Turn to Artificial Intelligence to Transform the Supply Chain. *Thomas* <https://www.thomasnet.com/insights/zara-h-m-fast-fashion-ai-supply-chain/>

<https://www.nike.com/sustainability>

<https://sneakerimpact.com/pages/company>

World Economic Forum · Here's how artificial intelligence can benefit the retail sector <https://www.weforum.org/stories/2023/01/here-s-how-artificial-intelligence-benefit-retail-sector-davos2023/>

Sampo Parkkinen. "Council Post: Advanced AI: The next Frontier in Beauty Technology." *Forbes*, 12 August 2024. <https://www.forbes.com/councils/forbestechcouncil/2023/11/17/advanced-ai-the-next-frontier-in-beauty-technology/>

Collin, Béatrice, and Marie Taillard. *Digital Makeover: How L'Oréal Put People First to Build a Beauty Tech Powerhouse*. John Wiley & Sons, 2021.

InsightAce Analytic. "AI in Mental Health Market Share, Size, Growth and Forecast to 2031." *www.insightaceanalytic.com*, 2024. <https://www.insightaceanalytic.com/report/global-ai-in-mental-health-market-1272>

Coelho, Maria Carolina Cordeiro Dias. "AI-driven personalization in beauty retail: exploring how AI-based applications influence customer satisfaction and brand loyalty." PhD diss., 2024.

Mangtani, Neelam, Nibha Bajpai, Sangeeta Sahasrabudhe, and Deepak Wasule. "Importance of artificial intelligence and augmented reality in cosmetic and beauty industry post COVID 19." *World Journal of Pharmaceutical Research* 9, no. 8 (2020): 2296-308.

Raval, Helly Yogeshkumar, Satyen M. Parikh, and Hiral R. Patel. "Self-maintained health surveillance artificial intelligence assistant." In *Handbook of Research on Lifestyle Sustainability and Management Solutions Using AI, Big Data Analytics, and Visualization*, pp. 168-184. IGI Global, 2022.

Vatiwutipong, Pat, Sirawich Vachmanus, Thanapon Noraset, and Suppawong Tuarob. "Artificial intelligence in cosmetic dermatology: a systematic literature review." *IEEE Access* (2023).

De Nóbrega, Maria Margarida Durão Pereira. "Beauty Tech: how can Technology Make a Change, Creating a More Consumer Friendly Business Model." Master's thesis, Universidade NOVA de Lisboa (Portugal), 2022.

Elrick R., E. (2022). 10 impacts of artificial intelligence on our everyday life | *liberties.eu*. *Liberties.eu*. <https://www.liberties.eu/en/stories/impact-of-artificial-intelligence-in-everyday-life/4422>

Ucdavis.edu. (2024). Artificial intelligence for food and health white paper January 2024. UC Davis Innovation Institute for Food and Health. <https://foodandhealth.ucdavis.edu/wp-content/uploads/2024/04/Artificial-Intelligence-for-Food-and-Health-1.pdf>

Robertson, A. (13 September 2024). Don't ask if AI can make art — ask how AI can be art. *The Verge*. <https://www.theverge.com/2024/9/13/2424189/generative-ai-interactivity-art>

Winn, Z. (2023). If art is how we express our humanity, where does AI fit in? *MIT News | Massachusetts Institute of Technology*. <https://news.mit.edu/2023/generative-ai-art-expression-0615>

Robertson, A. (13 September 2024). Don't ask if AI can make art — ask how AI can be art. *The Verge*. <https://www.theverge.com/2024/9/13/2424189/generative-ai-interactivity-art>

Valencia, N. (6 December 2023). The impact of AI tools on architecture in 2024 (and beyond). *ArchDaily*. <https://www.archdaily.com/1009545/the-impact-of-ai-tools-on-architecture-in-2024-and-beyond>

Grand View Research · AI in Food & Beverages Market Trends <https://www.grandviewresearch.com/industry-analysis/ai-food-beverages-market-report>

Ucdavis.edu. (2024). Artificial intelligence for food and health white paper January 2024. UC Davis Innovation Institute for Food and Health. <https://foodandhealth.ucdavis.edu/wp-content/uploads/2024/04/Artificial-Intelligence-for-Food-and-Health-1.pdf>

Team EMB. (18 March 2024). AI in personalized nutrition and diet: Transforming the way you eat. *EMB Blogs*. <https://blog.emb.global/role-of-ai-in-personalized-nutrition-and-diet/>

Arrigo, L. (September 2024). Navigating the ethical considerations of AI in the fashion industry. *aimodelagency.com*. <https://aimodelagency.com/navigating-the-ethical-considerations-of-ai-in-the-fashion-industry/>

What are the ethical implications of using AI in fashion design in 2024? (n.d.). *blog.stateless.nyc*. <https://blog.stateless.nyc/what-are-the-ethical-implications-of-using-ai-in-fashion-design-in-2024/>

McIntosh D. M., Suzuki G. S., Schaal Y., L. (2024). AI and the Copyright Liability Overhang: A Brief Summary of the Current State of AI-Related Copyright Litigation. *www.ropesgray.com*. <https://www.ropesgray.com/en/insights/alerts/2024/04/ai-and-the-copyright-liability-overhang-a-brief-summary-of-the-current-state-of-ai-related>

Roos, J. (2023). Artificial Intelligence: Copyright & Consequences. How Singapore's FinTech Regulatory Sandbox is helping fintech innovators accelerate time to market <https://www.edb.gov.sg/en/business-insights/insights/how-singapore-s-fintech-regulatory-sandbox-is-helping-fintech-innovators-accelerate-time-to-market.html>

EMA offers a regulatory sandbox for companies to test new products and services in a 'safe space'. <https://www.ema.gov.sg/regulations-licences/regulations/policies-frameworks/regulatory-sandbox>

Overall, P. (10 October 2024). How to balance AI-driven efficiency with people-centred retail innovation. *Retail Bulletin | Daily UK Retail News*. <https://www.theretailbulletin.com/retail-solutions/how-to-balance-ai-driven-efficiency-with-people-centred-retail-innovation-07-10-2024/>

Bateni, A., Chan, M. C., & Eitel-Porter, R. (2022). AI fairness: from principles to practice. *Lawton, G.* (2024). AI transparency: What is it and why do we need it? *CIO*. <https://www.techtarget.com/searchcio/tip/AI-transparency-What-is-it-and-why-do-we-need-it>

Henderson, B. H. (1 October 2024). 2 years of generative AI in business: Transformation, new risks. *CMSWire.com*. <https://www.cmswire.com/customer-experience/2-years-of-generative-ai-in-business-whats-changed/>

Arrigo, L. (September 2024). Navigating the ethical considerations of AI in the fashion industry. *aimodelagency.com*. <https://aimodelagency.com/navigating-the-ethical-considerations-of-ai-in-the-fashion-industry/>

Henderson, B. H. (1 October 2024). 2 years of generative AI in business: Transformation, new risks. *CMSWire.com*. <https://www.cmswire.com/customer-experience/2-years-of-generative-ai-in-business-whats-changed/>

Overall, P. (10 October 2024). How to balance AI-driven efficiency with people-centred retail innovation. *Retail Bulletin | Daily UK Retail News*. <https://www.theretailbulletin.com/retail-solutions/how-to-balance-ai-driven-efficiency-with-people-centred-retail-innovation-07-10-2024/>

Lawton, G. (2024). AI transparency: What is it and why do we need it? *CIO*. <https://www.techtarget.com/searchcio/tip/AI-transparency-What-is-it-and-why-do-we-need-it>

What's the future of generative AI? An early view in 15 charts. (25 August 2023). *McKinsey & Company*. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-generative-ai-an-early-view-in-15-charts>

Artificial intelligence and sustainability in the fashion industry: a review from 2010 to 2022 <https://link.springer.com/article/10.1007/s42452-023-05587-2>

Artificial intelligence in fashion – the risks, the rewards, and the responsibilities <https://www.theinterline.com/2024/09/25/artificial-intelligence-in-fashion-%E2%88%92-the-risks-the-rewards-and-the-responsibilities/>

Zen Analyst. (May 2023). Amazon's AI Ambitions: Unpacking The Potential Rewards And Risks. *Seeking Alpha | Stock Market Analysis & Tools for Investors*. <https://seekingalpha.com/article/4603090-amazons-ai-ambitions-unpacking-the-potential-rewards-and-risks>

Vincent, J. (10 October 2018). Amazon reportedly scraps internal AI recruiting tool that was biased against women. *The Verge*. <https://www.theverge.com/2018/10/10/17958784/ai-recruiting-tool-bias-amazon-report>

Henderson, B. H. (1 October 2024). 2 years of generative AI in business: Transformation, new risks. *CMSWire.com*. <https://www.cmswire.com/customer-experience/2-years-of-generative-ai-in-business-whats-changed/>

What's the future of generative AI? An early view in 15 charts. (25 August 2023). *McKinsey & Company*. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-generative-ai-an-early-view-in-15-charts>

Overall, P. (10 October 2024). How to balance AI-driven efficiency with people-centred retail innovation. *Retail Bulletin | Daily UK Retail News*. <https://www.theretailbulletin.com/retail-solutions/how-to-balance-ai-driven-efficiency-with-people-centred-retail-innovation-07-10-2024/>