Machine Learning – Introduction to Machine Learning (Unit 1)

Overview of the Module Unit

This module has introduced the foundations and real-world relevance of machine learning, looking at how it's evolved over time and where it's heading. It covered how machine learning connects with big data and AI, and explored the use of algorithms—both the opportunities they create and the challenges they raise. The structure included team-based work, an e-portfolio, and weekly discussions, all aimed at helping us apply concepts in context. The session on Industry 4.0, based on Schwab (2016), gave us a good starting point to think about how digital transformation is already reshaping sectors we're interested in.

What I Have Learned

I've come away with a clearer understanding of the main categories of machine learning and how it's used in different industries. I now know more about the skill sets needed to get into this field, and I'm more aware of what can influence how machine learning models perform. The lectures and collaborative activities helped me see the bigger picture—how data, algorithms, and industry needs all connect. Working through the team project and setting up the e-portfolio also helped me stay organised and apply what we're learning in a more hands-on way.

Collaborative Discussion – Week 1 Initial Post

This post was written in response to the discussion topic based on Metcalf's (2024) article, which looks at how Industry 5.0 shifts the focus from pure automation and efficiency (as seen in Industry 4.0) to something more human-centred. It's about building smarter systems that are also more ethical, resilient, and responsive to real-world needs.

In my post, I looked at how this shift is starting to play out in the beauty industry, especially with how companies are using AI for things like personalised skincare and reducing waste. I also discussed the 2021 Estée Lauder data breach as an example of how a failure in information systems can cause major disruption—not just operationally, but in terms of customer trust and brand reputation.

Metcalf (2024) makes it clear that Industry 5.0 isn't just about having more advanced tech, but about integrating it in a way that actually benefits people. The Estée Lauder case shows what can go wrong when that balance isn't there.

Below is a screenshot of my original post where I unpack this in more detail.

Initial Post

by Chiamaka Ndudirim - Tuesday, 14 October 2025, 10:03 PM

Metcalf (2024) points out that the move from Industry 4.0 to 5.0 isn't just about better technology—it's about re-centering humans in the process. While Industry 4.0 focused heavily on automation, smart factories, and data systems, Industry 5.0 introduces a more balanced approach where innovation is guided by human-centricity, sustainability, and resilience (European Commission, 2021; Metcalf, 2024).

In the beauty sector, these shifts are already visible. Brands are using AI and advanced analytics to deliver personalised skincare, optimise production, and reduce waste. However, Metcalf (2024, p. 20) also warns that the same interconnected systems driving efficiency can create major vulnerabilities. A real-world example is the 2021 **Estée Lauder Companies** data breach, where over 440 million internal records were exposed, disrupting digital operations and eroding consumer trust (Forbes, 2021). The incident highlighted how quickly a single system failure can ripple across global operations—affecting reputation, customer experience, and economic performance.

Industry 5.0 pushes beauty companies to go beyond technical innovation. It's about merging human creativity and empathy with digital intelligence—building systems that are secure, transparent, and ethically aligned with the people they serve (Metcalf, 2024).

References

European Commission (2021) *Industry 5.0: Towards a sustainable, human-centric and resilient European industry*. Publications Office of the European Union.

Forbes (2021) 'Estée Lauder data breach exposes 440 million records', *Forbes Technology*, 12 February.

Metcalf, G. S. (2024) 'An Introduction to Industry 5.0: History, Foundations, and Futures', in Nousala, S. et al. (eds) *Industry 4.0 to Industry 5.0*. Singapore: Springer, pp. 1–29.