ML and Organizational Transformation

Mahmut Osmanovic

January 2025

How does ML impact organizational decision-making and business strategy? Data driven decision making enables managers to make decisions on the basis of evidence rather than on intuition. According to Erik Brynjolfsson, companies in the top third of their industry in the use of data-driven decision making were, on average, 5% more productive and 6% more profitable than their competitors [2][4]. Not only are data driven technologies more profitable, they in addition enable machine based real-time dynamic decision making [5].

Previously to recent rapid technological advancements, *the-highest-paid-person-opinion* (HiPPO) was entrusted with a substantially disproportionate amount of decision making power. They were often senior managers with a solid track record of experience that they have built up throughout the years. Their extensive experience enabled them to internalize both patterns and relationships with a great deal of attention to details. Although the rationale may be considered sound at the time, it can in large parts, as of 2025, safely be considered outdated. The former CEO of Netscape quipped:

> *If we have data, let's look at data. If all we have are opinions, let's go with mine* [1].

The decision are in other words based on evidence, deduced through insights that are data-based rather than decision making through accumulated human experience. Human decision making, although at times quick and versatile is susceptible to biases of various kinds. The human bias includes but is not limited to emotions, prejudice and various types of favoritism. Data driven decision making enables individuals to a great extend to be promoted and hired on the basis of their merits. It enables businesses, e.g., airlines to more precisely estimate their time of arrival, consequently both streamlining the travelers experience and cutting down on expenditures.

What are the challenges organizations face in integrating ML into their workflows? The challenges come in various forms, although mainly centered around three main themes. The three themes are decision making culture, technological expertise and openness to experience.

Company leaders still must harness the ability clear goals, define what success looks like, and ask the right questions [4]. Perhaps to an even greater extend than previously.

It essential for success that leaders adopt and establish an evidence-based culture. Two straightforward techniques that can aid them in that objective. Firstly, ask themselves, *What does the data say?*. Secondly, dare to allow themselves to be overruled by the data [4]. Managers should be specially careful to avoid using superficial uses of data in order to justify predetermined decisions, otherwise the data is rendered superfluous.

It is not enough for companies to just collect data. They must be able to generate meaningful insights from the data. That is where Data Scientists come into the picture. They clean, process and analyze the data to derive valuable insights. In addition, it is of vital importance that they effectively communicate their insights decision makers. Without the technical expertise and the communication capabilities of these individuals, no ML-models can reliably be integrated within earlier business workflows.

New technologies are continuously being released to the market. In 2016, Hadoop emerged as a leading and innovative technology. Nonetheless, as of today, Apache Spark has established itself as a leading framework for big data processing. Hence, it is important for IT managers to periodically offer their IT employees opportunities to harness upcoming technologies. Whereas IT-employees would be expected to stay curious and eager to improve.

How can organizations assess their ML maturity, and what are the key stages in this maturity model? Organizations can assess their AI maturity through their existing level of data availability, existing it-infrastructure, data utilization and managerial practices. Before anything else, without data, no informed decision can be made. It is simply a perquisite. Hence it is a requirement to track business relevant key-performance-indicators, as well as collecting a lot of meaningful and quality rich data. There must be technical expertise available to make sense of the data. The technical experts are expected to be able to leverage newly released modules and frameworks to generate valuable insights. For instance, they may be using Apache Spark for data processing and advanced analytics. Lastly, as with alluded to in previous paragraphs, it is of vital importance to shift managerial attitudes to such that both authorize and empower evidence-based decisions.

What are the limitations of current research on ML's impact on organizations? The literature is to a large extend written on the basis on and collaboration with large companies. Whilst it manages to highlight important insights, it fails to generalize across small and medium sized companies. SME (Small-Medium-Enterprises) in fact make up 99% of all business in the EU [3]. Their challenges are comprised of different, and often of unique budget and time constraints.

A reoccuring problem with reasearch in ML and Organization is related to Martec's Law. It states that technology changes exponentially whilst organizations change logarithmically. Subsequently, in time, organizations can be *reset* or will be destroyed.

> *The evidence is clear: Data-driven decisions tend to be better decisions. Leaders will either embrace this fact or be replaced by others who do* [4].

This law renders large parts the previous technology and organization research not

up to date. Nonetheless, it will most likely still be of high relevance to businesses in the early to mid stages of development.

References

[1] Erik Brynjolfsson, Lorin M Hitt, and Heekyung Hellen Kim. The rapid adoption of data-driven decision-making. *American Economic Review*, 101(3):33–39, 2011. doi: 10.1257/aer.101.3.33.

[2] Erik Brynjolfsson, Lorin M Hitt, and Heekyung Hellen Kim. Strength in numbers: How does data-driven decision-making affect firm performance? *Available at SSRN 1819486*, 2011.

[3] Katia Fach Gomez and Catharine Titi. Facilitating access to investor-state dispute settlement for small and medium-sized enterprises: Tracing the path forward. *European Business Law Review*, 34(7):1040–1041, 2023. ISSN 0959-6941.

[4] Andrew McAfee and Erik Brynjolfsson. Big data: The management revolution. *Harvard Business Review*, 90(10):60–68, 2012.

[5] Thorsten Wuest, Daniel Weimer, Christopher Irgens, and Klaus-Dieter Thoben. Machine learning in manufacturing: advantages, challenges, and applications. *Production Manufacturing research*, 4(1):23–45, 2016. doi: 10.1080/21693277.2016.1192517.