ML and Organizational Transformation

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How does ML impact organizational decision making and business strategy? Data driven decision-making and machine learning stand to fundamentally shift the process behind decision making and business strategy. This is accomplished by going from decisions based on opinion and intuition to knowledge and analysis. By providing accurate information on the current state of the business supported by data, machine learning allows managers to make faster and more accurate decisions. The result of this is an increase in productivity and profitability of 5% and 6%, respectively, for companies in the top third of their industry in terms of being characterized as Data Driven [1], [3].

What are the challenges organizations face in integrating ML into their workflows? When integrating machine learning into a business multiple challenges arise. Previously decisions have been largely based on the intuition and knowledge of the current leadership. In order for a company to effectively benefit from machine learning in decision-making, the leadership must be willing to allow data to supersede their own intuition [3].

Talent management provides yet another challenge for companies seeking to integrate machine learning into their decision process. In general there are not enough data scientists to go around. A lack of employees with the right skill set provides a large barrier to entry as technology and tools are becoming more affordable. It has been found that companies with a larger percentage of college educated employees, solid investments in IT and many routes for attaining information about machine learning and data-driven decision making are much more likely to successfully adopt data-driven decision making [3], [2].

In order for a company to effectively drive adoption of data-driven decision-making the leadership must foster an appropriate company culture, where data and analysis is prevalent throughout the organization. This in essence is an issue of attitude towards data-driven decision-making within the company that has to be actively encouraged [3].

How can organizations assess their ML maturity, and what are the key stages in this maturity model? To evaluate maturity in regards to machine learning and data-driven decision-making, the following three questions about the use of data within the company can be examined [1].

- the existence of data for decision making in the entire company.
- the usage of data for the creation of a new product or service.
- the usage of data for business decision making in the entire company.

This provides a general structure for the assessment of ML maturity within a company.

No integration The company does not have the data to be able to integrate machine learning, in order to advance the company has to acquire relevant data.

Initial Integration The company has acquired the data needed for integration of machine learning but has not yet made use of the data in any meaningful way.

Intermediate Integration The company makes meaningful use of the acquired data within development of some products or services.

Full Integration The company makes meaningful use of the acquired data within development of products or services as well as in the business decisions made throughout company. The use of data and analysis permeates the entire company.

What are the limitations of current research on ML's impact on organizations? One limitation found in current research on the impact of ML on organizations is the focus on larger companies. The impact of ML on smaller companies is not quantified and further research is needed.

Another limitation found in current research is the lack of established methods to evaluate the impact of ML. This lack of standardized methods can make it challenging to assess the full impact of data-driven decision-making and ML, both in terms of financial gain and business strategy [1], [3].

References

[1] Erik Brynjolfsson, Lorin M. Hitt, and Heekyung Kim. Strength in numbers: How does data-driven decisionmaking affect firm performance? Working Paper 4732-10, MIT Sloan School of Management, 2011. Available at SSRN: https://ssrn.com/abstract=1819486.

[2] Erik Brynjolfsson and Kristina McElheran. The rapid adoption of data-driven decision-making. *American Economic Review: Papers Proceedings*, 106(5):133–139, 2016. DOI: https://doi.org/10.1257/aer.p20161016.

[3] Andrew McAfee and Erik Brynjolfsson. Big data: The management revolution. *Harvard Business Review*, 90(10):60–68, October 2012. Accessed from Harvard Business Review, available at hbr.org.