AI in Business: Seeing through the Fog of War

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Much like war, contemporary business is filled with risk and uncertainty (Knight 1921). Ambiguity is often times the grey area that hovers between what is risky and what is uncertain (Ellsberg 2001; Fox and Tversky 1995). In cases of battles, when the fog

disappears combatants can see with much clarity and make informed decisions.

Imagine a battle taking place in World War II. The fog of war creates ambiguity. It clouds an important reality of war: enemies are somewhere, but we don't know where they are, and have no further information about them. In such a case, we are dealing with a matter of uncertainty. When the fog disappears, the issue of uncertainty dissipates and combatants now have to make a decision based on risk analysis.

New technologies helped see through the fog of war during World War II. For instance, the invention of radar helped identify the location of enemy aircrafts that were not visible to the naked eye.

In recent years, science and technology have helped humanity find clarity on what is explainable and what is not yet explainable. Humans developed theories in order to have the predictive ability to see through what is unclear.

Let's consider ontological categories such as physical science, life sciences, and social sciences. In all these sciences, humans have looked into predicting directions and movements. For instance, in physics, it was formerly impossible to predict the direction of a particle. But thanks to theory and experimentation, we can now predict the movement of an electron. Uncertainty continues to exist in the physical sciences. In social sciences, since humans are more complex, at each level of their "movement" (to use the metaphor of the electron), they get some new information, which may change their understanding of a situation and hence endogenously change their direction. Predicting human behavior is therefore a very complex matter with high level of uncertainty.

New Level of Clarity

In recent years, artificial intelligence - the ability of machines to demonstrate intelligence - has shaken up the technological world. Like the radar, AI helps in adding clarity to the unseen.

The term Artificial Intelligence (AI) was coined by John McCarthy in 1955 in a proposal for a summer research project to be held in Dartmouth in 1956 (McCarthy et al. 1956). AI constitutes a major form of scientific and technological progress, which can generate considerable social benefits as well as economic benefits (Agrawal, Gans, and Goldfarb 2018). AI can be understood as a general-purpose technology (Brynjolfsson, Rock, and Syverson 2018). But, beyond the "simple" toolkit approach, AI and machine learning techniques can help deconstruct whether we are in an uncertain environment or an ambiguous one. These new techniques are leveraged by data accessibility, being structured and unstructured data. The latter is the new addition to our decision process.

Through AI, time is – even more – of the utmost importance. In a way, time is "expanded" through the convergence of algorithms, computing power, and data. As a result, information gets to a point closer to where a decision can be made. Predictive power is gained. Somewhat like a radar that is able to read through a thick cloud cover.

> *For businesses, AI adds a new level of operational clarity that helps companies see through this fog of war.*

AI will add $13 trillion to the global economy over the next decade (Fountaine, McCarthy, and Saleh 2019). The two AI tools helpful in seeing though clouded conditions are: Automated Intelligence and Augmented Intelligence (sometimes called Decision Intelligence (Warin and Sanger 2018)).

Automated Intelligence pertains to AI techniques utilized in robots to create efficient machines that lead to better decision making. In industry, breakthroughs in AI have led to enhancement in productivity in manufacturing, state-of-the-art X-ray machines in healthcare, and autonomous vehicles in the transportation sector.

Augmented Intelligence are AI systems designed to help humans make better decisions. It has aided policymakers through the expansion of data accessibility. Many financiers are using innovative algorithms to speed up operational processes and reduce uncertainty.

A Vantage View

AI such as Augmented Intelligence has redefined business modalities in several ways and opened up fresh industry perspectives.

Operational value. In a firm's valuation, intangible assets are important (De Marcellis-Warin and Teodoresco, 2012). In this process, a key question needs to be answered for clarity: Can we measure one of the most important intangible assets, reputation? AI can help, by using semi-supervised machine learning techniques based on Natural Language Processing techniques and by leveraging social media conversations as a form of big data. Businesses need to think about how to best filter information to make it more relevant to their operation. If properly executed, it could provide benefits such as the ability to measure "e-reputation" live in various geographical contexts. It would lead to cognitive insights that could elevate the brand of the company as well as its products.

Risk management. Financial institutions are exposed to countless riskss. These risks exist not only in the form of systematic or specific risk, but systemic risk as well. With AI, it is possible to look at systemic risk through a meso analysis. A meso analysis captures data from a firm as well as other firms in the same industry. It requires creativity and unconventional ways of looking at issues. For instance, data from corporate boards of financial institutions across the world can be gathered and analyzed to determine the extent of connectivity and centrality of a financial institution. Graph theory can then be applied to these massive data sets to evaluate risk exposure.

Managing people. In managing human resources, compensation is often based on key performance indicators (KPIs). Today, internal data is used to reward employees. For instance, if a company's subsidiary in Vienna sells more than the subsidiary in Barcelona, the team in Vienna will get a higher bonus. However, through the use of cluster analysis of industrial data one would be able to better contextualize performance. A more thorough assessment will be done to determine whether the Barcelona team exerted a greater effort to accomplish their results. Through AI and the leveraging of data, better indicators are created and with less bias. This approach can subsequently lead to an improved way of managing people.

Strategy formulation. Companies have access to millions of data points. It is therefore imperative to capture and analyze data well in order to formulate effective strategies. In data analysis, it might make sense to pursue an intermediate level of analysis. One that is between meso level (industry analysis) and macro level (country analysis). Using such approach would mean looking closely at cross-industry level based analysis that examines ecosystems using cluster analysis. A Venn diagram across industries can be used to assess complementary features in their integration (i.e., horizontal and vertical). Typically, data is collected based on definitions of variables originating from academic theory. A more inferential perspective can be used that leverages data and graph theory to see live interactions and networks, and hence examine the (living) perimeter of a true ecosystem. Through AI techniques, integration of companies within an ecosystem can be viewed thereby uncovering the life cycle of a cluster. In addition, computations can be made to evaluate a similarity index to measure extent of integration. It is important for business leaders to understand under which ecosystem they belong. With enhanced measurement and contextualization, better strategies and decisions are made.

Conclusion

In World War II, the radar was a technological game-changer that altered the course of battles by providing a view of the unseen. In today's competitive and combative business world, Augmented Intelligence is an equally powerful tool that provides cognitive insights for business leaders to gain an edge and see through the fog of war.

▶ References

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