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How will Artificial Intelligence alter the Premises of Strategic Thinking?

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Abstract: The probability is high that Artificial Intelligence (AI) will provide the answer to future product and market innovations. It has the ability to induce fundamental change in products, markets, business models and paradigms. Manufacturing and a wide spectrum of services are undergoing a near revolutionary change driven by AI delivered innovations. Computing equipment capable of what one may term partial and quasi intelligent behavior is the trigger. Ways and means of converting this new phenomenon into the strategic behavior of firms is a murky process today.
A link to corporate strategic behavior is missing. And this will be the focus of this article.
The article resorts to qualitative analysis as medium. It starts with an attempt at creating a simple framework for of Artificial Intelligence and a segmentation of the types of artificial intelligence that exists today and, possibly, in the short to medium terms. It proceeds to suggest a conceptual model for transition from AI processes to the strategic behavior of a firm. Put differently, the integration of the innovative patterns of AI into the strategic behavior of organizations. Case evidence, follows.
The article builds on work done on AI and strategic thinking and delivers a novel model for process integration. Analysis is based on contemporary research in AI and the current state of the concept. Strategic thinking elements are based on frameworks developed in the latest decade.
Keywords: Artificial Intelligence, Strategic thinking.

1 Introduction

The probability is high that Artificial Intelligence (AI) will provide the answer to future product and market innovations. It has the ability to induce fundamental change in products, markets, models and paradigms. Manufacturing and a wide spectrum of services are undergoing a near revolutionary change driven by AI delivered innovations. Computing equipment capable of what one may term partial and quasi intelligent behavior is the trigger. Ways and means of converting this new phenomenon into the strategic behavior of firms is a murky process today. And this will be the focus of the following article.
The article provides an attempt at creating a simple framework for Artificial Intelligence and view the artificial intelligence that exist today and that of the longer term. It proceeds to suggest a conceptual model for the integration of the innovative patterns of AI into the strategic behavior of organizations. The model identifies different states of AI strategy integration and case supportive evidence follows. An assessment of AI impact on the concept of strategic thinking concludes the analysis.
The article builds on recent work done on AI and strategic Thinking and delivers a novel model for process integration
This model could provide a powerful tool for corporate search of an approach to AI strategy conversion.

2 Artificial Intelligence: A framework

The Artificial Intelligence concept lends itself to segmentation and there are different approaches to AI technology segmentation. One can consider AI in terms of time i.e. present day vs. future events or state of complexity i.e. weak or strong or degree of "genericness" i.e. General AI

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vs. Applied AI.

2.1 The Time Dimension

AI could fall, from a time point of view, into two categories. (The Conversation, November 14, 2016).

2.1.1 Present Day Artificial Intelligence

These present day intelligent systems are able to handle massive volumes of data but lack the analytical and independent self-awareness element that will be key to building future intelligence. They are either reactive or limited memory.

Reactive. These are equipment that analyzes possible moves, their own and their opponent‟s, and choose the most strategic move. They do not have the ability either to form memories or to use past experiences in order to guide current decisions. The computer's perception of the world is direct and it acts according to what it sees.

Limited memory (corrective). These equipment use past experience in order to influence future decisions. They can look into the past but past information are only transient and are not saved as part of a library or a learning experience.

2.1.2 Future Event Artificial Intelligence

Systems within this AI segment do not only form representations about its own world, but also about other agents or entities in the world. They to not only understand consciousness, but have it.

Theory of mind. This is a psychology term. It refers to the understanding that others have beliefs, desires and intentions that impact upon the decisions that they make. Also those others have beliefs, desires, intentions, and perspectives that are different from one's own. This kind of AI does not yet exist.

Self-awareness. In this category, AI systems have a sense of self and consciousness. Machines with self-awareness understand their current state and can use the information to infer what others are feeling. Conscious beings are aware of them, know about their internal states, and are able to predict feelings of others. This type of AI does not yet exist.

2.2 The Complexity Dimension

Complexity could lead to another segmentation of AI. AI could be Strong or Weak. Weak AI is a system that is designed and trained for a particular task. Strong AI has generalized human cognitive abilities that allows for unfamiliar tasks to be tackled with enough intelligence.

2.3 The Genericness Dimension

AI can also be looked at as General AI (GAI) and Applied AI (AAI). Whereas GAI implies machine intelligence that could successfully perform any intellectual task a human can, AAI is a function of machine learning and predictive analysis – that is, a program written to learn and adapt.

AI is functionally linked to Data Sciences. Data Sciences are conceptual frameworks that deal with Big Data or data sources that are, generally, high-volume (humongous structured and unstructured), high-velocity and high-variety (UNECE, 2013). Data Analytics (DA) is the science of examining raw data with the purpose of drawing conclusions about the inputs. DA involves applying an algorithmic or mechanical process to derive insights as, for instance, running through a number of data sets to look for meaningful correlations between each other. The focus of DA lies in inference (not necessarily statistical) which is the process of deriving conclusions that are solely based on known inputs. Forecasting consumer behaviour, for instance, could be one of those application areas. . Data analytics is, as such, an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from accessible data delivered in a variety of forms, both structured and unstructured.
There are descriptive analytics, diagnostic analytics, predictive analytics and perspective analytics.

3 AI and Corporate Strategy Formulation

A conceptual model earlier work by the author suggested that outputs of Artificial Intelligence processes could induce strategic behavior if they take the shape of function fulfilling products catering for present or future market needs. Conventional product and market focus may give way to function focus. AI innovations would introduce function fulfilling instruments that may deviate, substantially, from age old products and their R and D derivatives. Strategic behavior could convert these innovations into novel product and market opportunities enhancing competitive advantage and or inducing dynamic synergy. (El Namaki, 2018).

The following diagrams illustrate this approach. It is a matrix where a product or a service function is projected along one axis and a relevant market segment is projected along the other axis. The prime assumption is that functions, whatever their nature, are fulfilled through a product or a service delivered to a respective market or market segment. A function fulfilling medium, be it a product or a service, could be the outcome of existing R and D or an AI innovation. Either have a relevant market and specific market traits.

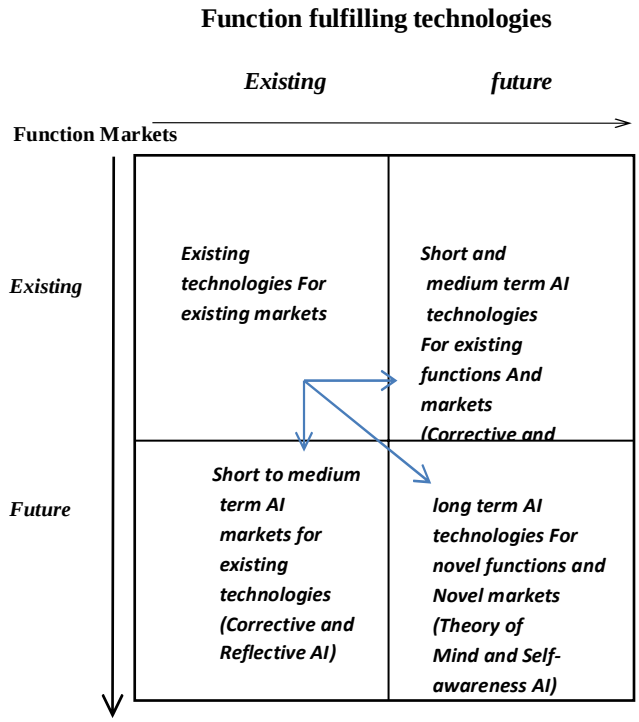

Fig. 1: From AI to strategy formulation.

The matrix identifies four patterns of AI compatible strategic behavior:

- Status quo. Existing technologies for existing markets. A pre-AI phase.
- AI technologies providing function fulfilling substitutes to existing products or instruments within the same market. Strategic behavior aims at endorsing and leveraging AI added value.
- AI developed novel functions and function fulfilling technologies for novel markets. Strategic behavior here aims at the advent of new industries and markets.
- Novel AI derived markets for existing products or technologies. Strategic behavior here addresses the needs of the new markets and seeks compliance with the requirements of that market. (El Namaki, 2018)

To illustrate, AI could guide the design process i.e. Let the product developer know, during the design phase, whether a specific design congrues with function requirements or user expectations or not. . It can go through the proposed user flow and determine whether the product is functioning compatible or not. (https://eteam.io/blog/ai-and- product-development-design) . It can extend computerized support to various tasks and phases of the product development process thus substituting or even eliminating individual interventions. AI-based learning could substantially automate discovery across many domains where classification and prediction tasks play an important role," (WSJ, June 15, 2018) Huawei,,s urban management software could, for example, be placed within the second segment i.e. an AI developed function fulfilling substitute. NATO"s AICA, warfare counter adversary software, represents a novel AI developed technology for a new markets (US Army Research Laboratory, March 2018).
And Bayer"s product testing provides an AI developed market for an existing product (DHL, 2018).

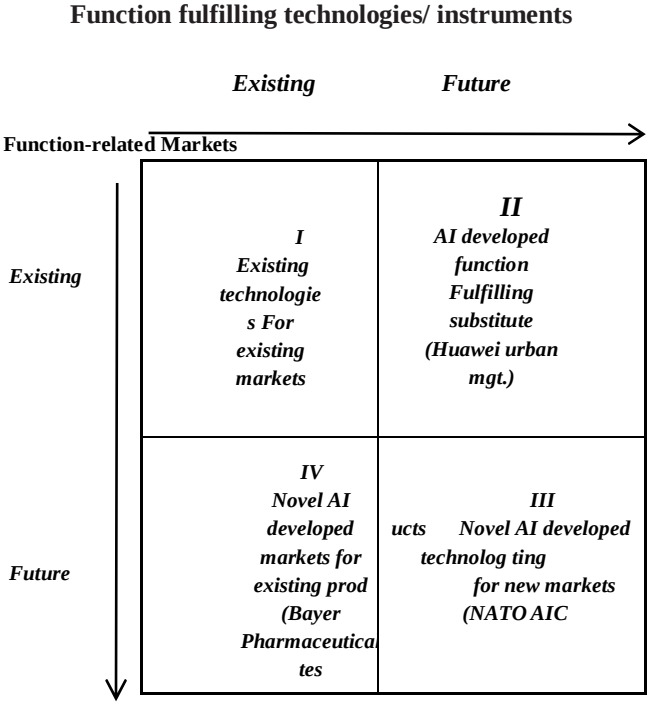

Fig.2: The positioning of corporations.

The consequence is an AI industry reach that will be wide and deep and touch almost all key industries of today from banking, health care and life sciences, to energy, communication and retailing.
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4 Five Conceptual and Operational Implications

AI will likely have far reaching impact on a number of fundamental strategic thinking premises and processes. Consider the following:

From product to function. AI frameworks will very likely to lead to a shift from strategic product and market focus to function focus. Functions will determine the instrument, being a product or a service, congruent with business environment conditions. Function analysis derived from big data will contrast with „need analysis drawn from market parameters. (Mirko Karakašić et al, 23, 5(2016)) Rather than relying on customers to tell a business what they want from a product, data analysis will point to the ultimate function fulfilling medium.

The long term becoming the short term. Time is a measure of events. And their sequence. Duration of events and the intervals between them marks the lapse of time. The shorter the duration and the faster the flow of events the greater the conscious "feel" of time. AI will, more likely than not, lead to a greater number of threshold events and a faster flow of those events. Event flow and sequence will constitute a yardstick to measure business strategies and their ultimate outcome. Long and short terms, in conventional analysis, will give way to event fulfillment and the speed of this fulfillment.

Redefining strategic thinking An AI compatible profile of CEO"s will soon emerge, AI will be driving a new cultural paradigm in which automation, and data-driven facts trump opinions and where probabilities are used to address uncertainties. This is an era of human- machine collaboration which will require a rethink of traditional human operating models, role definitions, individual success measures and career progress.

Conventional management strategy involving planning, certainty, hierarchies, functional silos, incremental innovation and execution will give way to new modes and approaches/ (Information Age, Oct 2018).

A different shape of industry structure. Long cherished industry structure drivers as power of buyers, power of suppliers, entrance and substitution (Porter, 1980) will give way to factors as , industry function fit, industry life cycle slope and industry overlap. .AI industry penetration will be wide and deep. The result will be deep and far reaching restructuring of industries as banking, urban management, health sciences, communication, energy and retailing.

From competitive advantage to competitive intelligence. Concepts of competition will assume different parameters from those recognized in contemporary economics and management frameworks. Future competition among firms will likely depend more on innovative intelligence rather than competitive advantage. Businesses extracting "intelligence" from data will have a competitive edge within an environment driven by forces artificial intelligence.

Quality of intelligence can make the difference between competing firms.

5 Conclusions

The field of artificial intelligence creates ability in computing equipment to manage data and induce analytical potency. It is a strategic industry with a potentially far reaching impact on business and government. .

This article provides a basic framework of AI core concept as it stands today. It also refers to the role of Big Data as well as data analytics in the process. Earlier case-based analysis by the author has led to a conceptual model that relates AI processes and outcomes to corporate strategic thinking. This model was further explored in this article and some tentative conclusions were derived. Those are hypotheses for further future analysis. Prime among those conclusions is the hypothesis that function will drive AI product and service innovation. Another one is the change in time parameters. And a third one is the radical shift in the strategic management domain.

Entry of AI in the business strategy domain will have deep and far reaching impact on the approach, content and modes of conduct of business. Corporations and countries have come to grips with that. Political leaders as President Putin (and President Xi of China) have gone as far as relating future country global leadership position to the measure of command that that country will have of Artificial Intelligence!

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