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How artificial Intelligence is changing the Premises of Entrepreneurship

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Abstract: ´Artificial intelligence is omnipresent. It is changing the functional dimension of business, the scope of industries, competencies of executives and last but not least the premises of strategic thinking. But artificial intelligence is inducing massive change in another area that is seldom addressed in current AI contexts: entrepreneurship. This article discusses how AI is changing the texture of entrepreneurial opportunities, the demands of the entrepreneurial function, the premises of entrepreneurial thinking and the patterns of entrepreneurial strategic thinking.

Keywords: AI, strategic thinking, entrepreneurship

1 the Problem

Artificial intelligence is omnipresent. It is changing the functional dimensions of business, the scope of industries, competencies of executives and last but not least the premises of strategic thinking. But artificial intelligence is inducing massive change in another area that is seldom addressed in current AI contexts: entrepreneurship. AI is changing the texture of entrepreneurial opportunities, the demands of the entrepreneurial function, the premises of entrepreneurial thinking and the patterns of entrepreneurial strategic thinking.

This change will be the focus of this article.

The article starts with a brief survey of the tenants of enterprise as well as artificial intelligence. It then proceeds to explore the impact of artificial intelligence tenants on the demands of the entrepreneurial function, the strategic thinking dimension of the process, the trait profile of the entrepreneur and last but not least the entrepreneurial opportunity arena.

2 The Essence of Entrepreneurship

Entrepreneurship is the process of identifying opportunities and exploiting them. Entrepreneurship is widely regarded as an integral player in the business culture of American life, particularly as an engine for job creation and economic growth (Mcleland, 1976). But who is an entrepreneur? Views vary: some are rational and others border on the romantic! It, most commonly, connote the conversion of an opportunity into a running business venture.

Several scholars played a role in conceiving the concept and giving it its intellectual content. Four did that with a distinction, each with his own unique views, conceptual tenants and underlying premises. Those include Joseph Schumpeter, Peter Drucker, David McClelland, and Henry Mintzberg. Several others complemented the analysis and the understanding of entrepreneurship owes a lot to the work of all those authors.

Creativity and creative destruction: Schumpeter. For Schumpeter and the Austrian School of economics (Schumpeter, 1950), an entrepreneur is a person who is willing and able to convert a new idea or invention into a successful business. Entrepreneurship, according to this school of thought, forces "creative destruction" across markets and industries, simultaneously creating new products and business models, and killing others (Schumpeter, 1984).

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This so-called creative destruction is largely responsible for the dynamism of capitalism and the long-term economic growth associated with it. Schumpeter placed the entrepreneur at the heart of the capitalist economic system to the extent that the eventual disappearance of the concept would lead to a collapse of the system itself. Fundamental to Schumpeter is innovation, meaning new products, new methods of production, new markets, new sources of raw material, new markets, and or new organizations (Schumpeter, 1984).

Innovation: Drucker. Drucker's work**s** seems to build on Schumpeter's innovation framework. He states: "what we need is an entrepreneurial society in which innovation and entrepreneurship are normal, steady and continual. Innovation and entrepreneurship have to become an integral life sustaining activity in our organizations, our economy, and our society" (Ducker, 1985). By stating that entrepreneurship is part and parcel of the workings of an economy and society he places the process at the heart of economic systems, policies and strategies. He also pierces through to the future and paints a picture of the role of entrepreneurship in the years to come.

Achievement motivation: McClelland. David McClelland addressed entrepreneurial traits and driving forces within the individual. He is most noted for describing three types of motivational needs: the need for achievement, the need for affiliation, and the need for power (McClelland, 1961). These needs are found, to varying degrees, in all individuals within an environment and their relative weight and mix characterizes a person's behavior, both in terms of being motivated, and in terms of managing and motivating others. The "need to achieve" (n-ach) measures the individual's desire to achieve. A high n-ach person is "achievement motivated" and therefore seeks achievement and attainment of realistic but challenging goals. He possesses a strong need for an achievement and progress feedback as well as a need for a sense of accomplishment.

Management competency: Mintzberg. Henry Mintzberg addressed the managerial role of the entrepreneur and how different that is from "classic" managerial roles within organizations. He also states that one of the executive roles of managers within organizations is to enterprise. As such the manager acts as an initiator, designer, and stimulator of change and innovator. He searches for new opportunities and explores the potential for change (Mintzberg, 1989).

3 Enter artificial intelligence

Artificial intelligence is a novel technology rooted force that is changing the foundations and premises of many concepts and practices, entrepreneurship included. To understand that let us identify the contours and scope of artificial intelligence and explore their impact on the concept and practice of enterprise.

Merriam-Webster defines artificial intelligence as "A branch of computer science dealing with the simulation of intelligent behavior ….. "As well as "The capability of a machine to imitate intelligent human behavior." (Forbes, Feb 14, 2018). In other words AI is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using the rules to reach approximate or definite conclusions) and self-correction (adjusting prospective actions to current outcomes). AI relates to many sciences from computing and data to psychology, philosophy and linguistics among others.

AI fragments could acquire a coherent whole if put within a systems theory framework. AI is pictured, then, as a system with inputs, transformations, outputs and a feedback loop. Data, raw and otherwise, as well as artificial neural sub-systems constitute the inputs. Learning (machine and otherwise) and analysis (diagnostic, predictive and otherwise) provide the transformation. Insights, technologies, as well as derived sub-systems constitute the output. A feedback loop conveys outputs to the input and transformation segments and triggers essential adjustments (see Figure).

AI outputs could extend over a wide front that would include insights, novel sub-system structures and derived and dependent technologies.

- **Insights**

AI processes could lead to insights or a capacity to gain an accurate and deep intuitive understanding of individuals and issues. Data insights could lead to abilities: to solve problems, through logical deduction or reasoning; to set and achieve goals; to understand spoken and written language or communication; and to infer things about the world via sounds, images and other sensory inputs. These abilities are expressed in many present-day applications, such as medical diagnosis, autonomous vehicles and surveillance.

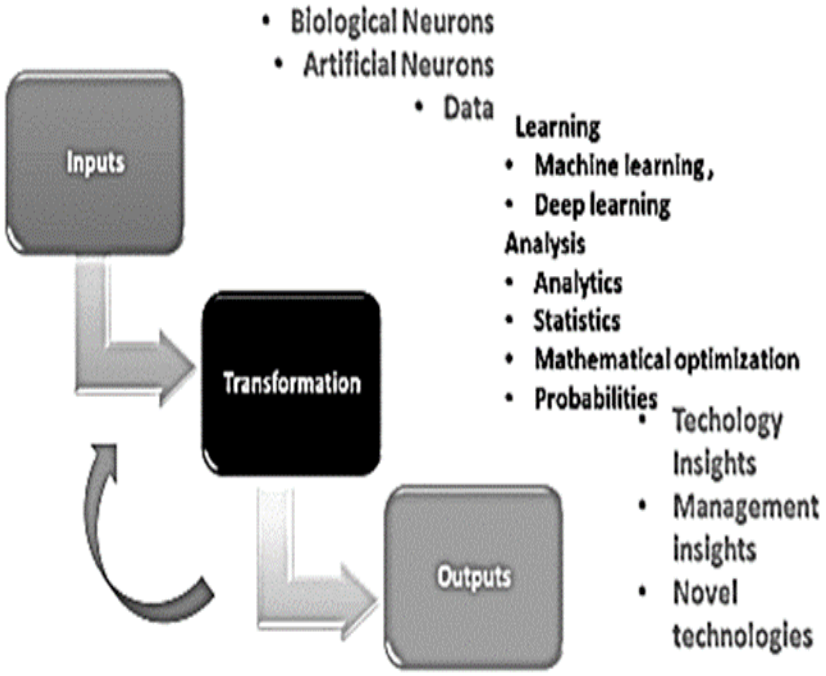
- **Novel sub-systems structures**

AI has the potential to penetrate industries where data are prevalent. Sub-systems congruent with the specific conditions of such an industry would, then, emerge and blend with the operating flows of the industry. Early signs of this penetration can be seen in a wide variety of industries from healthcare and banking to retail, logistics and communication. Present-day banking sub-systems, for example, include fraud detection and credit analysis, government sub-systems include facial recognition and smart cities, and health and life sciences sub-systems include predictive diagnostics and biomedical images. Several other sub-systems will soon emerge in manufacturing, logistics, marketing and, probably above all, security and defense.

- **Derived and dependent technologies**

A wide array of AI technologies is emerging. They vary in penetration but some are already identifiable. These include robotic process automation, biometrics, speech recognition, virtual agents' decision management, text analytics and natural language processing; these AI technologies are gaining situational significance

All in all artificial intelligence induces, ultimately, what we may term "generic disruption". Generic disruption is a force or a bundle of forces that cut across systems and reconfigure constituent elements. Generic disruption cuts across industries, markets organizations and functions. It does not arise from competitors in the same industry or even from companies with a remotely similar business model but from distant and previously unidentified driving force. It blends forces drawn from separate, seemingly unrelated strands of technology, primarily, in order to create dramatic value enhancing and rule changing propositions (El Namaki, 2014)(El Namaki, 2019).



Source: El Namaki, 2019

Induced influence of AI on the key premises of entrepreneurship

Artificial intelligence will influence enterprise in three ways: the opportunity horizon, the trait configuration and the performance outcomes. Artificial intelligence, whether narrow or broad, is having far reaching impact on business and the industry and consumers behind. This places the entrepreneur at a junction where there is no turning back. His only option is to look forward and position himself within the new arena.

The author should like, therefore, to formulate the following hypotheses.

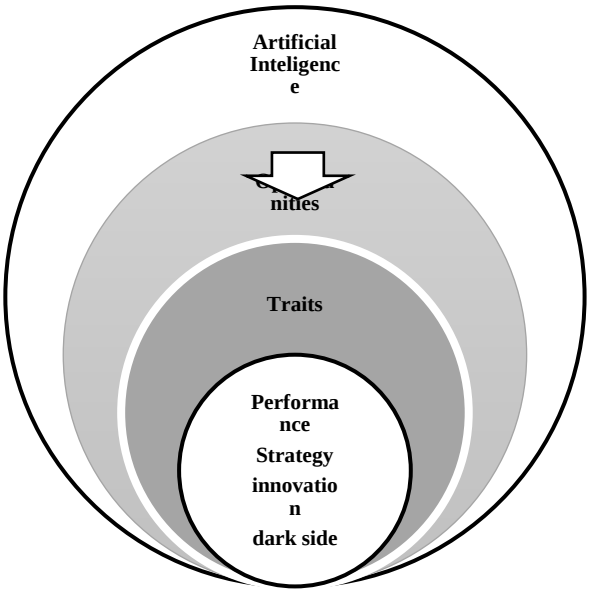


Figure: Induced influence of AI on key parameters of entrepreneurship.

- **Hypothesis one: Artificial intelligence will widen opportunity horizon**

Artificial intelligence will deliver three types of opportunities: input related opportunities, process related opportunities and output related opportunities. Input related opportunities will relate to data in terms of scope, scale, type, sourcing, processing, storing and conditioning. Add to that the emergence of quasi and shadow data as well as substitute data. Process related opportunities will relate to approach and methods of data analysis as well as the learning processes related to that data. Finally, artificial intelligence insights could deliver tangible product and function opportunities leading to the emergence of new industries and industrial arenas**.**

- **Hypothesis two: Artificial intelligence will alter entrepreneurial trait profile**

One may hypothesize that artificial intelligence processes and technologies could pose a challenge or even alter some of the traditional traits attributed to the entrepreneur. This challenge could relate to three traits: achievement motivation, risk taking, and visionary impulses. Artificial intelligence processes from data management to learning may pose a challenge to the entrepreneurs' achievement motivation drive and induce a strong desire to meet the forthcoming challenge. The entrepreneur's tendency to cope with moderate risk taking may also be stimulated by the artificial intelligence disruptive pattern of technology change. Artificial intelligence insights finally could trigger what one may refer to as "dynamic visioning" or the shifting scenarios within "infant" visions as a result of the ever evolving disruption.

- **Hypothesis four: Artificial intelligence will induce entrepreneurial innovation**

Innovation is inherent in the process of enterprise. It also, equally, constitutes an output within the artificial intelligence system. A prime function of an entrepreneur is to innovate in terms of products, industries, technologies and markets among other things.

Artificial intelligence supports this process through data analysis and induced learning. . AI technologies will, more likely than not, lead to a fundamental restructuring of industries and the emergence of new arenas. AI frameworks will very likely lead to a shift from strategic 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. (Karakašić, 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 (El Namaki, 2019).

The entrepreneur will more likely than not stand at the heart of this dynamic process.

- **Hypothesis five: Artificial intelligence may enhance the dark side of the entrepreneur**

The entrepreneurial function has dark sides and artificial intelligence can have an impact on those too. Key dark sides include a high sense of distrust, a dislike of feedback, resistance to technology change and high internal locus of control. Artificial intelligence technologies could enhance some of those dark sides. The most likely, from the author's point of view, could be the resistance to change. Most entrepreneurs embark upon a business where they have gained insight and competency through paid employment. Technologies implying a departure from the tried and trusted elements of past experience are, according to research, frowned upon and even resisted. And artificial intelligence brings along a lot of those technologies**.** (De Vries, 1985).

Case illustrations

Artificial intelligence software is in the way towards creating substantial start up opportunities. The majority focus on the process and delivery of AI services and products by providing solutions to a variety of end users.

Consider the following cases.

- **AI entrepreneurial technology application: Aito.ai innovative predictive analytics**

AI technologies open the door for entrepreneurs to enter or generate new industrial arenas. Data management is one of those arenas. Aito, a Finnish start up, did that by developing novel software that delivers fast and effective predictive analytics. Aito.ai predictive database runs machine learning on existing relational data for immediate predictions, future projections and recommendations. Aito is fully managed and hosted in the cloud, reducing effort to a bare minimum. Dataset inputted into an Aito Console triggers an immediate process of prediction. The approach is simple as Aito takes care of all the necessities such as machines, features and algorithms ensuring a smooth flow of the process. (https://aito.ai/blog/could-predictive-database-queries-replace-machine-learning-models/)

- **AI entrepreneurial technology exploration: Cerenion's brain analysis**

AI parallel analysis to the human brain is seen by some entrepreneurs as an opportunity and "CERENION C-TREND™ is one of them. The company offers what it describes as a "truly objective and practical method to obtain reliable information on the condition and function of the brain". The company's clinically validated measure can be integrated into EEG-measurement devices and patient monitors as a software feature. CERENION C-TREND™ is a medical-grade software solution that works by combining standard EEG-measurement with advanced machine learning algorithms and artificial intelligence. The result is a simple index that measures the condition and function of the brain on a scale from 0 to 100. The technology has the potential of improving both the quality and the cost of intensive care." (https://tutkijayrittaja.fi/en/cerenion)

- **AI late technology adoption : Blackberry's late AI technology adoption**

Delay in adopting AI induced competencies could amplify some of the dark sides of the entrepreneur. Blackberry is a case in point. Touch screen mobile phones embody early technologies as well as advanced AI-based ones. Blackberry ignored this innovation as loyalty to the fading keyboard technology took precedence over the user-preferred advanced touchscreen technology. Change came at a very slow pace as well. Company adoption of artificial intelligence and sensor technology – based touch screens came later than other key industry players. BlackBerry's once entrepreneurial management failed to anticipate the shift from product to function that AI brought about. It failed to realize that smartphones would evolve beyond mere communication to become full-fledged mobile professional and entertainment hubs within a "new "industry (Time, 2013).

Summary and Conclusions

Artificial intelligence is omnipresent. One comes across it in a variety of forms and a wide range of applications. It is changing the functional performance of businesses, the span and scope of industries, competencies of executive performers and last but not least the premises of strategic thinking. But artificial intelligence is inducing massive change in another area that is seldom discussed in current AI contexts: entrepreneurship. AI is changing the nature of entrepreneurial function, altering the demands of the entrepreneurial task, introducing new parameters for opportunity identification, reshaping entrepreneurial thinking and throwing new lights on the dark side of the entrepreneur.

Case illustrations support the hypotheses.

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