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How an Integration of Artificial Intelligence and Science Fiction Could Change the Premises of Strategic Thinking

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Abstract: Artificial intelligence technologies will very likely induce a fundamental shift in strategic thinking. And science fiction will provide a medium. Science fiction will change the scope, boundaries and contents of "Big Data" and consequently deep learning will introduce novel foundations for tomorrow's functions and products. It will provide the creative boundaries of those functions. Science fiction's speculative images of the future will constitute the foundation of imaginative and futuristic concepts leading to novel products and services. The outcome will be an intricate process that will blend artificial intelligence, science fiction and strategic thinking. And science fiction will provide a medium. This paper focuses on how science fiction will work as a medium blending AI and strategic thinking.
Keywords: Artificial intelligence, Big Data, Deep learning, Strategic thinking, Science fiction.

1 The Problem

Changing the scope, boundaries and contents of "Big Data" and consequently deep learning will introduce novel foundations for tomorrow's functions and products. It will provide the creative boundaries of those functions. Science fiction's speculative images of the future will constitute the foundation of imaginative and futuristic concepts leading to novel products and services. The outcome will be an intricate process that will blend artificial intelligence, science fiction and strategic thinking. But how will this occur? Artificial intelligence technologies will very likely induce a fundamental shift in strategic thinking. And science fiction will provide a medium. This paper focuses on how science fiction will work as a medium blending AI and strategic thinking.

2 What is **Artificial Intelligence**?

Artificial Intelligence can best be defined as a branch of computer science that deals with the simulation of human intelligent behavior. It is an attempt at simulating human cognitive processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for the use of this information), reasoning (using rules to reach approximate or definite conclusions) and self-correction (self-initiated adjustment or mending of errors and malfunctions). AI relates to many sciences from computing, mathematics and data to psychology, philosophy and linguistics.

AI concepts could be segmented according to the stage of concept development over time. There is the present where AI assumes a corrective and reactive dimension and the future where AI assumes an analytical and self-awareness dimension (The Conversation, November 14, 2016). AI could also be is pictured as a system with inputs, transformations, outputs and a feedback loop. Data, raw and other wise, 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. Feedback loop conveys outputs to the input and transformation segments and triggers essential adjustments (Figure 1; (El Namaki, 2019).

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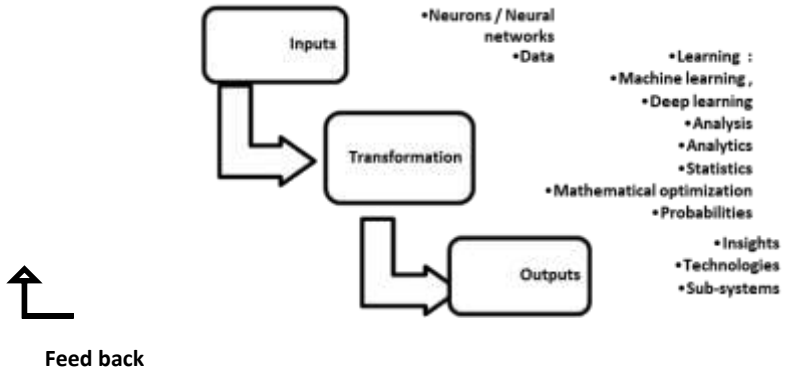

Fig.**1**: AI systems construct. **Source**: El Namaki,

3 What is Science Fiction?

Science fiction is defined as "fiction dealing principally with the impact of actual or imagined science on society or individuals (Merriam Webster, 2020). Science fiction content is imaginative, but is based on science. It relies heavily on science to configure its settings, characters, themes, and plots. One way of analyzing science fiction is segmenting it into soft and hard. "Hard" science fiction is fiction putting emphasis on scientific detail and accuracy while "Soft" science fiction places emphasis on social sciences from sociology and psychology to philosophy. Hard science fiction rely on sciences that explore the workings of the natural world as physics, chemistry and biology while soft science fiction deal with intangibles related to human behaviors, interactions, thoughts, and feelings (Helmenstine, 2019). Science fiction works dealing with technology and undiscovered science are more likely to be of the hard genre while those that deal with temporal setting and future history are likely to belong to the soft genre.

A prime science fiction contribution is that of redefining the essence of human and societal functions. It enables a reflection on the way one interacts with others, with technology, with the environment and with the future. It projects a vision for the future and creates a link between the present and the future. A future that can be proposed, modified, refined, and discussed (Z, 2016).

Fig.2: the building blocks of Science Fiction.

4 How will Science Fiction and Artificial Intelligence Relate?

Science fiction concepts, frameworks and outcomes are built around data. The composition and the relationships within that amalgam of data deviates, more frequently than not, from commonly accepted principles of science as we know them today. It often covers a different time span, develops asymmetrical relationships and breaks many of established present day scientific concepts and algorithms. Fundamental synergy could emerge from a "merger" between science fiction data and artificial intelligence's big data or that complex mass of structured and unstructured pieces of information providing the foundation of AI analysis and learning. An analysis that delivers predictions, patterns, trends and future outcomes as much as relationships and in sights.

Integration of "Big Data "and "Science Fiction Data" could deliver what we may term " Enhanced Big Data" . Or data structures where different genres of data co-exist and relate. These would allow collection and analysis of different types of data such as future projections, imaginative structures, novel modes of communication and loose time frameworks (Dean and Ghemawat 2004). Combining insights from these types of data with classical data analysis can result in a more profound understanding of behaviors of people, systems, processes, etc. (Sloot et al, 2018) And the exploration of new technology-rooted arenas, functions and products.

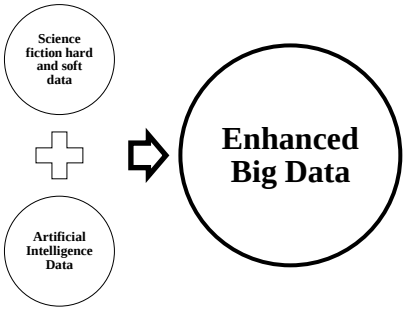

Fig.3: the composition of Enhanced Big Data.

Machine and deep learning would assume, then, novel roles exposing un-chartered areas of technology and innovation. Enhanced Big Data will be massive in size. It will, more likely than not, exceed the size of Big Data which is on itself too large or too complex for ordinary computing devices to process. It is plausible that future big data, and consequently enhanced big data, would reach a level of one terabyte or larger. (Cheick, 2019). A challenge will therefore emerge in capturing , storing , analyzing , sharing , , transferring , visualization, querying and updating of data.

5 How will Science Fiction and Artificial Intelligence Integration Impact Strategic Thinking?

One can hypothesize that integration of science fiction and artificial intelligence conceptual frameworks as well as data would lead to fundamental outcomes. Science fiction data defies what we know today and shows what can become reality tomorrow. The premise is not what know today, but it is a great source to what can be real tomorrow. Machine learning and deep learning software's will deal with an amalgams of new variables and a myriad of novel algorithms. This could become the source of diverse and previously unknown functions or creative approaches to perform existing and imaginary functions. A propensity to think beyond the possible.

Hypothesis one:
Enhanced Big Data could reveal new business and technology arenas and derived visions.

Enhanced of big data will open the door for novel visions or …." mental perceptions of the kind of environment an individual, or an organization, aspires to create within a broad time horizon and the underlying conditions for the actualization of this perception." Those visions will be built around innovation arenas, compatible resources and congruent leadership. They constitute (El Namaki, 1992). It could equally lead to fundamental restructuring of industries and the emergence of new arenas or fields for business and technology combat. It could also spell out new patterns for competitive behavior among a set of related industries or a segment of the economy. Gained insights could also lead to a "leapfrog" in the development of new industries, reconfiguring of existing industries and the emergence of new business areas (El Namaki, 1992).

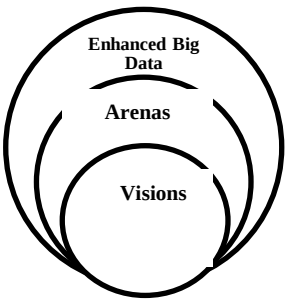

Fig.4: From Enhanced Big Data to novel arenas and new visions.

Hypothesis two
Conceived visions lead to Generic functions.

A function is the purpose of an object. Functions are powerful mechanisms for exploring the relationship between people and the instruments of their environments these instruments are function fulfilling products whose fulfillment has "missions", a technology mission, a sociology mission, an aesthetic mission and an economic mission among others. The technology and engineering missions deal with the performance of a technology-rooted process and the consequent design and manufacturing implications. The social mission is to make products transmit messages about themselves, their owners and their makers. The aesthetic mission is to express the products sensory values or sentiment and taste. Finally the economic mission expresses the exchange value of this product (Aurisicchio et al, 2011).

Hypothesis three
Generic function innovations could lead to new product concepts.

Design fiction (Julian Bleecker, 2009) provides a road to generic function induced innovation. It is a thought experiment, a way of purposefully imagining future societies while dispensing with technology or economics. The method uses fictional future scenarios in order to imagine and examine the use of products. The method uses fictional future scenarios in order to imagine and examine the shape and use of products. Design fiction "creates these conversation pieces, with the conversations being stories about the kinds of experiences and social rituals that might surround the designed object." Resort to product function analysis helps developing a function structure or an abstract model of the product, or product concept, without the material features of shape, dimension or elements. It provides a link with the environment where the product is born, used and abandoned. It also explores the host system, the environmental elements of use; the established and formalized functions; how to control the validity of the functions and a function characterization and hierarchy (Belu et al, 2011).

Selective case evidence

Case one: Man machine communication

Many science fiction products feature voice activated software. The idea featured in "2001: A Space Odyssey" episode where HAL 9000, the sentient A.I. who controls the systems of the "Discovery One spacecraft", performs voice activated interactions with the crew. A.I. voice activated assistants are common occurrence since the early introduction to a mainstream audience for the first time in the iPhone 4s in 2011 (Dormehl, 2018). A science fiction concept delivering a previously unknown communication functions with an arena, and a product.

Case two: Warfare drones

Drones put to use as hostile agents within a military conflict is a common theme in science fiction products. The concept is being introduced in real life warfare today. Swarm drones deployed in squadrons with a competency for independent thinking and coordinated maneuver are being introduced in warfare scenarios today.
Technology is yet to mature but the process is progressing fast. Future drone swarms are likely to possess the capacity to assess targets allocate
Tasks and conduct operations with or without human interaction. Advances in
Swarming technology are confidential but rapid progress is in the making. (Guardian, 4 Dec 2019). Hybrid composition of drone swarms creates a whole that is more potent than the parts. (Kallenborn, 2018)

Case three: driverless cars

IN 1964 the science-fiction author Isaac Asimov wrote an essay in *The New York Times* putting forward a number of projections 50 years hence... He stated "Much effort will be put into the designing of vehicles with 'robot-brains'—vehicles that can be set for particular destinations and that will then proceed there without interference by the slow reflexes of a human driver." Fifty some years later, in 2017 his prediction came true. Major technology corporations as Google and Tulsa are competing in the introduction of the first to sell self-driving vehicles to the public. Google car offers lessons about how science fiction can become fact (The Atlantic, 2014). . In a sense, Google's self-driving car constitute, in the authors view, a dramatic new vision for human transport.

6 The Emerging Strategic Thinking Framework

Strategic thinking frameworks will change considerably as a result of the ensuing analysis

"Enhanced Big Data" as we said earlier are data sets that combine a variety of sources where science fiction inputs are omnipresent. The triggers of strategic thinking, then, are insights gained from diagnostic and predictive analysis of the enhanced big data. Visions belong to those insights. And those visions will lead to novel business and technology arenas and functions.

It departs from traditional strategic thinking paradigms in several ways. First there is the trigger or the point of start of the strategic thinking process. Traditional analysis puts emphasis on an environmental scanning that could reveal "opportunities and threats". A scanning that cuts across all functional segments of the environment from the economic and political to the social and cultural. The suggested model's point of start is enhanced big data or that mass of information with the wider scope and broader cover. Traditional scanning is replaced by data bases that encompasses almost every existing and possible variable of relevance to and of possible impact on this environment.

Second there is the conceiving of visions. Visions of the past were indeed based on a perception of futures to come. Visions of the enhanced big data era will be based on big data analysis and learning. A process that might allow these visions to go beyond the recognizable and familiar. They may address the unimaginable and the blurred. The distant and the far reaching.

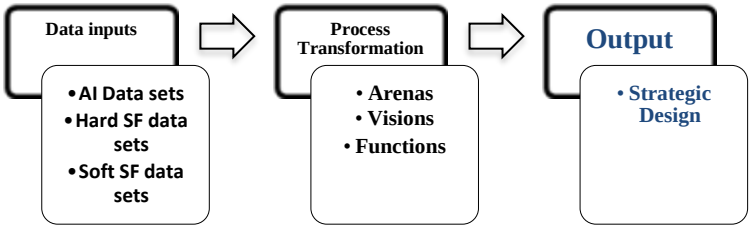

Fig.5: The emerging strategic thinking construct.

Third there are the tools of the analysis. Again traditional analysis resorted to the common instruments within economic and social science domains. The above model suggests a reliance on advanced tools resting on a foundation of data analytics. Diagnostic analytics and predictive analytics will be provide a strong impetus into the strategic thinking process. They will sketch a horizon that was unreachable before.
Fourth is the earmarking of an arena or a field of business combat. The suggested paradigm leaves the door quite open to encounters that never happened before. Competitive encounters within uncharted arenas. Competition, in that sense, is replaced by either synergy or destruction by substitution.
All in all strategic thinking will assume different dimensions within out novel framework.

7 Summary and Conclusions

Artificial intelligence technologies will very likely induce a fundamental shift in strategic thinking. And science fiction will provide a medium. Science fiction will change the scope, boundaries and contents of "Big Data" and consequent deep learning will introduce novel foundations for tomorrow's functions and products. It will provide the creative boundaries of those functions. Science fiction's speculative images of the future will constitute the foundation of imaginative and futuristic concepts leading to novel products and services. Events support the hypothetical impact of enhanced big data or the blend of artificial intelligence and science fiction data on the emergence of novel arenas, the conceiving of new visions and the development of new functions. The outcome is an intricate process that blends artificial intelligence, science fiction and strategic thinking. Also a strategic thinking conceptual framework that will identify broader inputs, novel analytical and strategy formulation instruments as well as more innovative outcomes.

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