

A Brand-New Definition of Management under the Rule of Robots

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ABSTRACT

Do you want your fate to be determined by a person who moves with the feeling, probably makes irrational decisions or is self-interested; or by an artificial intelligence that will always give priority to the common interests of the stakeholders in their decisions? The artificial intelligence applications developed to manifest human-like behaviours are expected to reach above the human level. It is only a matter of time. Therefore, the definition of management will eventually evolve. This paper discusses and suggests the elements that are required to be included in the new definition of management. Since the definition of future management is a challenging and disputed task, this paper aims to pave the way for a perfect definition of management that belongs to the age of artificial intelligence. As a result, in the perspective of evolution of human consciousness and emergence of management, and also considering the continuation of the evolution in inorganic domain, a new definition of management was suggested.

Keywords: Management, Consciousness, Evolution, Artificial Intelligence

1. INTRODUCTION: THE RISE OF ARTIFICIAL CONSCIOUSNESS

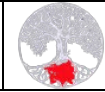
Intelligence can be defined as an agent that can perceive and act upon its environment and can determine its behaviour independently (Dieter Schmalstieg & Hollerer , 2016). It is an ability to learn new knowledge and understand reason in new situations (Rhem, 2005). Intelligence can also be defined as a mental capability that involves the ability to comprehend ideas, make plans, do reasoning, solve problems, cogitate abstractly and learn from experience (Goldstein, Princiotta, & Naglieri, 2014). Machines that are equipped with the skills belonging to humans have always been imagined throughout history. The Greek philosopher and scientist Aristotle imagined autonomous tools like tripods of the god Hephaistos that was mentioned in *The Iliad* of Homer (Nilsson, 2010). In his book *Leviathan*, Thomas Hobbes also mentioned that a producing artificial animal could be possible (Hobbes, 1651). Artificial intelligence is a reflection of these archetype imaginations. Craving to play the role of god may be the veiled drive lying behind the idea of creating artificial intelligence (Lavender, 2011).



Artificial Intelligence is a branch of computer science that concentrates on perception, reasoning and learning capabilities of the computers (Bar-Cohen, Marom, & Hanson, 2009). Artificial Intelligence refers to computer systems that simulate human intelligence using techniques of semantic representation and processing (Levy, 1997). Artificial intelligence simply means incorporating human intelligence into computer based applications (Donelan, Kear, & Ramage, 2012). Due to the exponential increases in computing, striking progress has recently taken place in the realm of artificial intelligence. Today, artificial intelligence is an integral part of daily activities, ranging from self-driving cars and drones to virtual assistants (Rose, 2016). Currently, there are various applications already based on artificial intelligence. Until the mid of this century, it is anticipated that intelligence explosion will take place in machines; and accordingly artificial intelligence would be beyond human understanding and control (Barfield, 2015). Today robots are capable of performing tasks at professions that require simple repetitive motions (Bello & Lokhorst, 2011). In the future, however, robots are likely to start assuming the exceptional tasks that require cognitive skills such as decision making and judgement.

That being said, some scholars predict that computers will be conscious; and have emotional and even spiritual experiences in the future (Thierauf, 2002). There is not a single definition of consciousness which is commonly agreed on and it is difficult to provide a clear and concise definition for it. Scientists often mention consciousness without attempting to make a strict definition that distinguish consciousness from other concepts related to mind (Izard, 1991). According to some researchers, consciousness is a mysterious concept and is placed at the heart of our reality (Hancock, 2015). Some definitions stressed and suggested that consciousness is related to reality (Wilber, 2002) and it is a fundamental component of reality (Bogdashina, 2013). Questioning the reality is strictly related to consciousness similar to the thoughts of Rene Descartes who questioned everything including his own existence (Sartre, 2002). Apart from emphasizing reality and existence, some definitions reflect a mechanistic view. Consciousness is an experienced electro-neuro-chemical representation of animal–environment relationships (Henriques, 2011). According to this neurocognitive approach, computers imitating biologic intelligence can naturally have consciousness. Even if it is not necessary, the consciousness is a decisive feature to be human is a view that is widely accepted. When the brain is considered as a machine, consciousness of the machines is an inevitable result; and machines will inevitably be superior over humans (Kurzweil, 2005).

Humans do not behave rationally in response to every phenomenon. Some researchers asserted that the normal state of human behaviour is non-rational (Sanderson & Gruen, 2006). Not all states of consciousness are purely phenomenal either (Seager, 2016). In some contexts, this means that some states of human consciousness are insane, which eventually sparks a serious debate on machine consciousness. When this matter is considered within the frame of this baseline, it means that machines may exhibit some irrational and insane behaviours in the future if they are to gain consciousness. In this case, "machine consciousness" emerges as a phenomenon that humanity should be wary of. Should such a scenario come true, robots can inflict physical or emotional harm to other living creatures (Müller, 2016).



2. DEFINITION OF MANAGEMENT

There is not a unique definition of management that is universally accepted. Simply, management can be defined as what managers do to maintain an organization and move it forward (Singh, 2010). In view of this definition, a manager is needed to perform a particular management activity. In addition, organization is naturally considered as a social unit that consists of human beings even if it involves the combination of people and machines (Brinker & Minnick, 2013). Similarly, mainstream definitions do not cover purely unmanned organizations or self-organized machines which will expectedly prevail and domain business life in the future. From the classical view of task-oriented managers, management is concerned with seeing that the jobs get done; and such an approach focuses on planning and guiding the operations. While another approach views management as intangible and abstract (Bose, 2012), some definitions emphasize the artistic characteristic of the management (Davies, Hertig, & Gilbride, 2015)(Goldsmith, 2011). This latter point of view is completely right because there are some implicit aspects which fall under the realm of art to motivate and lead employees (Lorenzana, 1998). At this point, it is necessary to differentiate management from leadership because leadership is a natural function of human beings like other social mammals, namely it is strictly related with our evolutionary process (Spisak, Nicholson, & Vugt, 2011). If there is not any human being in the organization, managers do not need to gain experimental tacit knowledge to lead and motivate employees that are substantially regarded as time-consuming activities.

Business management is a concept that is distinct from management. Management is as old as human history; yet business management concept emerged after the Industrial Revolution (Pollard, 1968) (Koçel, 2018). Its definition, therefore, focused on conducting business functions of enterprises. Concisely, there is distinction among leadership, management and business management. This paper focuses on the definition of business management and posits that this definition will change after the extinction of human employees in the work places.

According to the characteristics of the business performed, there are different management definitions. If there are more than one responsible person or owner, management can be defined as the combined efforts for overseeing the production of the employees and operations of the facility (Ackerman, 2013). In this definition, the role of the people is emphasized as overseeing the production of the employees. According to this definition, management activity belongs completely to humans. In some definitions that regard management as a collective action, the management means group of people who are responsible and accountable for directing the workforce and overseeing that the organization meets its objectives or goals (Lorenzana, 1998). This definition views management as a group activity that belongs to humans.

Another definition of management involves the process of accomplishing organizational mission, strategies, goals and objectives through the use of several resources including human, financial, physical and informational (Miles, 2012). This definition considers human as one of the resources. Organizations use human intellect as a resource accordingly. Yet, this resource can be replaced by the artificial substitute. Currently, there are two kinds of intellect which are organic and artificial. The latter, namely the artificial one, quickly replaces the other. Machines start to communicate and interact with other machines without any human intervention. Therefore, our understanding



regarding the group concept will need to change. Consequently, group behaviours of the artificial intelligences should be included into the new definitions of the management.

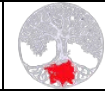
Some definitions include management functions as defined by Henri Fayol in 1916. According to the Henri Fayol, management functions are planning, organizing, coordinating, commanding and controlling. However, managerial activities do not completely fit the sequence and coverage of these functions (Thomas, 2008). In some definitions leading is an indivisible part of management and it is also one of the management functions according to modern views, defined as the use of influence to motivate employees so that the goals of the organization can be achieved (Daft, 1997). Having said that, it is also important to note that a new term should be developed instead of “leading” so as to define the directing and commanding activities among the new type of employees having artificial intellect. According to some definitions, decision making is an indivisible part of management. Management, in that context, is simply defined as the act of making decision about a business (Lima & Green, 2017). In this definition, "deciding" is essentially considered as a function of human intelligence. In the future, decision making will intentionally be left to the artificial intelligence because humans would be sure that machines are unbiased.

Another definition states that management is the coordination of all resources by means of planning, organizing, leading and controlling in order to attain the stated objectives (Gubbins, 2003). According to this definition, determination of the objective is a task that belongs to humans. The null subject implied in this definition is definitely a human. Hence, it can be suggested that this definition is incomplete and insufficient. Therefore, future definitions of management should completely clarify the role of artificial counterparts of humans. Goal setting is a very complicated activity for humans in today’s chaotic business environment because they have inadequate mental resources compared with those of future artificial intelligence which is expected to be superior to the human brain (Kurzweil, 2005).

In the extant literature, a generally accepted definition of the organization suggests that it is a goal-directed and intentionally structured social entity. In addition, managers need to have conceptual, human and technical skills to manage an organization (Daft, 1997). As implied in these statements, organization can only be set up and managed by humans. In the future, however, artificial intelligences will have the ability to organize themselves in accordance with a purpose. Furthermore, they can determine their purpose. Beyond all of this, they can formulate strategies for large organizations which only employ artificial counterparts of humans. Therefore, all of these definitions will be obsolete in the near future. Considering all these circumstances, it is very obvious that a new definition is needed.

3. HUMAN AS A SOURCE OF THE MANAGEMENT PROBLEMS

The extant literature has posited that one of the tasks of a manager is to diagnose the extent and reason of the problems arising from employees such as tardiness, inability to meet deadlines or undermining the authority, and so forth. Some of these employee problems may sometimes be time-consuming and difficult to solve (Iadanza & Dyro, 2004). Actually, in the organizations, the most important source of management problems is the humans themselves (Gabris, 1988). Some of the employees do not agree on the goals of the organization and it is such



employees that often underperform (Raines, 2012). The most salient and recurring problems are related to employees in organizations (Gabris, 1988). Sometimes employees can display violent behaviours, especially in certain periods like termination. Security personnel should be employed against such behaviours (McCrie, 2011). Managers mostly spend their time controlling waste of time, auditing travel vouchers and long distance phone records, consumption of office supplies and monitoring the attendance and punctuality, and so forth (West & Wart, 2009). Conflict is not desired in the organization. Yet, according to some scholars, conflict is inevitable among the demands and interests of employees and stakeholders (Brooks, 2018). Conflict wastes time and resources; it sometimes hinders the innovation in an organization; and it also decreases organizational performance (Bertocci, 2009). In order to alleviate conflict, goal congruence which definitely requires a sound and profound organizational culture should be set up among employees. Inspiring shared vision and fostering sound culture in the organization necessitates leadership abilities (Klenke, 2008). The presence of employees who do not have ethical values within the organization is another source of several management problems. Moreover, non-ethical managers may misuse the authority and impose discrimination and favouritism among employees (Civelek, Çemberci, & Günel, 2018). Elimination of human intervention to the business processes can cause decrease in bribery, misconduct, insubordination, abuse, corruption, forgery, embezzlement, sexual harassment, fraud and other illegal and dishonest activities, etc.(Civelek, 2009).

In commercial transportation, self-driving vehicles are expected to eliminate human error and negligence (Taylor & Bouazzaoui, 2018). Some employees are prone to engage in negligent or corrupt behaviours (Perla, Nikolaev, & Pasiliao, 2018). Today, human intelligence is unquestionably sustaining its superiority over its artificial counterparts. Humans are flexible and they can quickly adapt themselves to exceptional tasks. They are still superior to artificial intelligence in quick decision-making and taking immediate action under uncertainty because humans are less deterministic compared to artificial intelligence (Müller, 2016). Therefore, today's organizations continue to suffer from the disadvantages created by humans. The artificial intelligence applications which are developed to do human-like behaviours are about to reach above the human level and it is only a matter of time to attain such a level. For this reason, companies will not have to endure the human-caused adversities in the future. However, according to some views, artificial intelligence never reaches human level because it ostensibly makes creative decisions. Yet, this view is not exactly true today because learning machines can modify their decision-making rules autonomously (Chen, 2018).

4. CONCLUSION: AN ATTEMPT TO DEFINE MANAGEMENT AGAIN

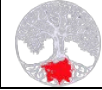
The evolution of consciousness and management is associated with each other. Learning and reasoning activities can be considered as primitive form of consciousness and evolution of learning in animals can be associated with the evolution of consciousness (Jaynes, 1976). When considering the essential of consciousness as questioning the reality and existence, it can be associated with the invention of religion. Simultaneously, invention of religion provides a social control tool to form and direct large human groups for the sake of divine and lofty goals. Excavations in Göbekli Tepe which is the first human built holy place dated approximately 11.500 years ago indicate that religion plays an important role in the development of agriculture and permanent habitation as well



(Torrey, 2017). The religion that emerged as a result of questioning the nature led to formation of large human groups. Formation of large human groups also causes some management problems which led to the development of management. Therefore, the evolution of consciousness and development of management may be associated with one another. After the development of agriculture and permanent habitation, humans faced more complicated management problems that could not be solved by natural leadership processes per se so they needed sophisticated rules and shared values as social control mechanisms to keep large groups together.

Today, humanity has reached an important milestone in its evolutionary process. Biological evolution will be succeeded by technological evolution (Soraker & Steinhart, 2013). Machines will achieve consciousness. There are not valid grounds why inorganic material cannot make same transition that carbon did (Mintzberg, Ahlstrand, & Lampel, 2013). Inorganic conscious forms can produce themselves in different forms. This phenomenon can be called as the rise of the inorganic life and the continuance of the evolution in an inorganic domain. In the future, humanity will more likely be in symbiosis with these new inorganic life forms (Soraker & Steinhart, 2013). According to the prediction of Ray Kurzweil, artificial intelligence will be a billion times more capable than human intelligence by the mid of this century (Hansell & Grassie, 2011). Sharing their lives with more clever and conscious life forms will lead to the emergence of complicated legal problems for the humanity. Current laws deem the robots as a property. But the question “what will legal status of the artificial intelligence be in the future?” still remains unanswered (Ersoy, 2017). In several countries, inquiries are conducted on robots' rights (Turkle, 2011). Some researchers suggested that future conscious robots can be considered the same as the slaves in ancient times (Kakoudaki, 2014). In this case, the rules of ancient Roman law on slavery may be proposed as a legal base for the human-robot interaction. Yet, treatment like a slave to more intelligent and superior creature is not sustainable for the humanity. Establishing a legal base for the human-robot relationships will be an existential problem for the human being. In the long-run, equality-base solutions would be more reasonable. Implementing slave laws to the robots is an anthropocentric approach which views our species at the center of universe (Leach, 2015). Although it is not true, we actually step into a new era in our biological evolution and we are about to create new inorganic species by means of our own hands. This new species will probably dominate the world like once dinosaurs did in the Mesozoic era (Nichols & Johnson, 2008).

Given that parallelism between the evolution of consciousness and management, inevitable rise of superior artificial intelligence may lead to unprecedented changes in the science of management. Accordingly, making some amendments and adjustments in the definition of management will be needed. In the current context, management is defined as both a science and an art (Ravi, 2015)(Kumar & Sharma, 2000)(Liebler & McConnell, 2016) and it also contains intangible aspects. In this paper, several definitions in the extant literature have been reviewed. Generally, most of these definitions contain some elements that belong to humans. In addition, in all these definitions, humans are implied as the final decision makers. This premise seems to be valid as yet. Yet, in future businesses, human intelligence will be inadequate to make the decisions. Therefore, the definition of management should be made again by considering human-robot equality and even superiority of the robots.



In this paper, new management definition suggested as follows by confining it in the frame of business management: “The attainment of the required functions to sustain an artificial intelligence system to make decisions by optimizing the common interests of stakeholders to perform a business in an effective and efficient manner and to lead the group behaviours of artificial intelligence units in the system. “

The definition of future management is a challenging and disputed task that would be impossible to be covered thoroughly by a single paper. Considering the limitations, therefore, this definition is expected to spark discussions and debates by providing a baseline for future researchers.

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