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Can Biomimicry and Managerial Concepts Come Together?

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Abstract
Purpose: Biomimicry, as a new way to create technology, provides new perspectives and innovations for companies' strategies. Biomimicry has been used in different fields such as architecture, product design, engineering and production processes since the 1990s. Although its long history, biomimicry and managerial concepts were handled together in just a few studies. The primary purpose of this paper is to handle biomimicry and managerial concepts together and to bring a managerial perspective to biomimicry.
Design/methodology/approach: This study used a qualitative approach by exploring existing literature and relevant cases for biomimicry and selected managerial concepts.
Findings: The study has put forward twelve propositions in order to correlate biomimicry and managerial concepts. We tried to correlate leadership and biomimicry in terms of harmonized individuals and teams and flexibility and courage ability of leaders. With regard to innovation, biomimicry is a powerful driver to accomplish and sustain innovation processes. On the other hand, biomimicry is a relevant concept of being an open system of companies and a significant tool of strategy formulation. Finally organization structure is linked with biomimicry in terms of being organic, lean and self-replicating.
Research limitations/implications: It has also significance to future research in sustainability issues.
Practical implications: The study could be a starting point or a guideline for companies to survive by mimicking nature.
Originality/value: This study is a step forward in understanding the link between biomimicry and managerial concepts.

Keywords: Sustainability, biomimicry, business strategy, strategy formulation, leadership, innovation, organization structure.

Introduction

In 1920s, the relation between biology and management began with General Systems Theory asserted by Austrian Biologist Ludwig von Bertalanffy. He argued that every organism was a system, which he defined as a complex of elements in mutual interaction. In order to understand any system, he suggests, it is necessary to understand not only the parts but also relations that exist between them. He also claims that population system maintaining itself in dynamic equilibrium (Hammond, 2010) and examines the world (or only a system) as a whole. This development of biology science were adapted to management field as contingency (situational) approach. According to this approach, there is no one best approach to universalize a set of management principles. Some dynamics such as organization structure (Burns and Stalker, 1959), modal techonolgy (Woodward, 1958) or combination of several contextual factors (Lawrence and Lorsch, 1967) were studied by researchers to explore how contextual factors affect management.

At the same period, in 1950s, entropy and negentropy concepts which are inspired from thermodynamics and biology fields became important and needed to be considered. Because both of system approach and contingency approach bring forward that organizations consider their environment to challenge entropic effects and survive. These consecutive ideas lead to strategic management field inspire from natural selection process. Organizations adapted some supportive ideas from natural selection process to their strategic management processes. From this point of view, organizations became a kind of practitioner of a Latin sentence, 'Ego primum tollo nominor quoniam leo'.

By 1970s, management field has maintained inspirations from biological systems. Population ecology approach was one of the most important approaches which was proposed in that time. According to authors (Hannan, Freeman, 1977), the intensity of inertial pressures on organizational structure recommends the application of models that rely on competition and selection of populations of organization.

After all interactions between biology and management field, this relation has become more significant, intense and overlapped as organizations consider and make the nature better and more sustainable. To understand this view, we can start with a book. Rachel Carson wrote her well known book 'Silent Spring' in 1962, and the World Day was first celebrated in 1970. Environmental awareness had arisen 50 years before the present-day. In 1960's consumers had understood they cannot be indifferent towards environmental problems any more. And in 1970's consumers started to move for the environment (Carmin, 1999). The course of environmental awareness was so fast since the negative changes, caused after the Industrial Revoluation, were visible. Düren (2000) points out that in 1970's and 1980's important institutions of the period published reports which called attention to environmental issues. These reports had a common feature; pessimism.

Limits to Growth Report (Meadows, et al., 1972) were published on behalf of the Club of Rome in 1972. Rapid population growth was drawn attention in the report. Besides available world resources will not be enough for economic and population growth were pointed out. Our Common Future Report is an also another report which had the feature of pessimism. In this report, is also known Bruntland Report, the term sustainable development was first defined. According to Bruntdland Report; (World Commission on Environment and Development, 1987) '*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'* The report emphasized the idea of 'borrowing from future'.

The environmental movements of the period have forced business to choose one of these two issues: the environment and economic growth. This obligation identified as the major reason for pessimist feature of the reports. However, this strict approach moderated in time. New approaches which meet economy and ecology at common points have been arisen (Düren, 2000). Especially in last 10 years it has been pointed out that business may have a transformative role (Fisk, 2010). The present system of thought regards sustainability as a pre-assumption. It is believed that new economy will be shaped around this concept. Economic variables are not used alone as a performance measurement method any more. Environment and social variables have been added to performance measurements. Sustainability frame emphasizes a triple dimension which contains 3P (people, planet, profit) **(**Slaper and Hall, 2011). Business has a great power which can be used for transformation. Business can also direct this power towards what is good (Hutchins, 2013-A). Rules of nature will be a good guide to make this transformation real.

After sustainability framework and environmental movements are adopted by many organizations, today they face virtuality and even digital transformation. This requires to observe the nature much more and implement some practices such as open source approach, open innovation strategies, sharing economy and so on. As is seen, since the beginning of management history, management field has benefited from biology through its history. This interaction between management and biology has begun with systems approach, it became strong with other contributions such as contingency approach, strategic management (based on view of natural selection), total quality management, population ecology, evolutionary economics, chaos and complexity theories, learning organization, environmental sustainability, open resources, sharing economics, etc. These kind of analogies are put managerial concepts across in a different way.

Companies' growth struggle and their formulating strategies show similarity to laws for growth and development of biological systems. In this perspective, biomimicry is a way of thinking based on biological systems and models, too. Biomimicry has brought an insight in 3 dimensions; existence status in nature of beings, when beings satisfy their own needs, at the same time they have an approach which they satisfy needs of nature and efficient and adaptive sustainability characteristics of ecosystem in where beings are (Journal Official de La République Française, 2015). For this reason, this study is based on the association of management and biomimicry as a biological aspect to business by depending on the history that management and biology are integrated for a long while.

Under all assumptions and gaps indicated above, the primary purpose of this paper is to handle biomimicry and some managerial concepts including leadership, innovation, organization structure and business strategy together, bring a managerial perspective to biomimicry and present a set of foresights about this linkage. Today, living with a nature and its rules became more important issue for companies. Nature is helping and moderating to companies to innovate more rational and reasonable goods and services. Therefore, establishing this relation is an important step for organizations mimicked nature. This effort makes the paper more valuable for the related literature.

Biomimicry

The term biomimicry was first used by Janine Benyus in her book 'Biomimicry: Innovation Inspired from Nature'in 1997 (Ministere de l'Ecologie, 2012) (Benyus, 2002). Biomimicry comes from the roots which are 'bios' and 'mimesis. Bios means life and mimesis means to imitate in Greek (Benyus, No Date). Biomimicry Institute defines biomimicry as: 'Biomimicry is an

approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies.' (Biomimicry Institute web site)

When biomimicry seeks solutions, its main inspiration source becomes nature. There have been 30 million spices on earth which have survived since 3.8 billion years. Biomimicry explore problems which these spices were faced and seeks solutions and strategies which were created for these problems. According to biomimicry's view, when humanity faces a problem, solution of the problem has already been found by one of these spices (Benyus, 2002). Throughout history people have always mimicked nature. We can multiply examples of words which inherited from nature: swimming, flying, diving.

Determining nature as a guide is not a new frame. Igloos are good examples of nature mimicking. Eskimos built Igloos by monitoring polar bears. There is another example from an artist who was one of the bests in his term. Leonardo da Vinci had examined birds closely to invent the first plane (Romei, 2008). From the explanations, it can be deduced that in 1990's there was a transformation of mimicking nature thought. Biomimicry represented a systematic discipline.

There are a great number of innovations invented by using biomimicry which we use every day. Velcro is one of these innovations. Velcro was invented by George de Maestral after exploring plane-tree seeds stuck on his clothes and his dog's fur and noticing little hooks at the end of the seeds (Mirko, 2014). Nature has a perfect system. In front of this perfect system, mankind must be like nature, instead of using it.

Biomimicry points 3 dimension of nature out; nature as a model, nature as measure and nature as a mentor (Riley and Gadonniex, 2009). Dicks (2016) also addresses biomimicry from this point of view and adds fourth one: nature as physis. It means 'self-production or self-placing into the open'. From another perspective, the aim of biomimicry is to analyze the multidimensionality of complex equilibrium mechanism of ecosystem as source of inspiration, and to develop sustainable innovation strategies from that. Innovation can be seen in 3 levels; product/output level, organization level and multi directional interaction with environment level, in other words strategic level (Journal Official de La République Française, 2015).

Biomimicry is a method. It is a natural process that biomimicry has tangible outputs in some disciplines like architecture or design. These outputs embody as tangible assets. Whereas if biomimicry is used in social cases and strategy creating processes, great advantages will bring in order to sustain sustainability.

The aim of biomimicry is not to provide a copy from the nature, it actually focuses on principles and adapt to companies' needs (Kennedy, et al., 2015). Biomimicry are being used in more and more companies in their different functions. However when the literature is viewed, there are not enough studies which explore biomimicry-management relationship. This article reviews the biomimicry concept and gives prepositions by determining intersection areas between biomimicry and management.

Managerial Concepts

Biomimicry is to develop sustainability innovation strategies by inspiring by nature. The most important insight which biomimicry brings to organizations is to create a very suitable platform where innovation and sustainability together have a potential (Journal Official de La République Française, 2015).

Actually in order to develop business models to search inspiration in nature is not new. However the novelty which comes with biomimicry is sustainable innovation approach, in other words to be at peace with every aspect with nature (Journal Official de La République Française, 2015).
Biomimicry's main focus can be seen on product design; however it has some other reflections for business, e.g. organizations and team management. 'Swarm Intelligence' is one of the examples for these reflections (Dargent, 2011). To enhance perspectives of biomimicry for business implications, we choose some managerial concepts. These are leadership, innovation, business strategy and organization structure. The reason for choosing them is to have several characteristics in common. They are basic dynamics for business survival and implicit concepts for companies all the time.

Leadership

What do we expect from today's leaders? Every person including academicians, students, employees etc. has a different answer to that question. Today, leaders are expected to understand and absorb sustainability first and then to establish a mentality for change in a good way both economically and socially (Rogers, 2011). As Mahatma Gandhi once stated: 'I suppose leadership at one time meant muscles; but today it means getting along with people.' How can a leader get along with people and/or employees? or Is there a must to be a leader in an organization? Answers may come from nature via biomimicry. As discussed above, sustainability is one of the pre-assumptions in today's business life. How can biomimicry help leaders to attain sustainability?
Present day's one of inevitable element of success is team work. For a successful teamwork every team member must understand this motto: 'If every person in a team tries to be best, rather than the best person on the team, each individual will complete each other to achieve the goal.' (Hanson, No Date). If everyone in a team feels themselves that they have the responsibility; creativity and productivity may occur in an easy way. That situation will increase participation and objectivity when it is time to decision (Katz, 2013). When we look at the nature, we can see the relationships are multifaceted. For example let's take a look at trees. In spite of the fact that they are competitors for getting the same nutrition from soil, they can live collaboratively (Hutchins, 2013-A).
Collective intelligence is a kind of management to get things done via crowd wisdom. Wikipedia is a good example of collective intelligence. When you, as a volunteer, want to change something, you can. Centralized control cannot almost be seen (Malone, et al, 2010). However millions of people all over the world use Wikipedia every day and when we use it we expect that it is true and we generally believe that it is.
When considered for biomimetic leaders, they trust and use collective intelligence, rather than forcing members to obey the rules which come from the top levels (De Luca, 2014). We have to keep in mind that individuals alone are not enough to give direction to our future. They need organizations like networks to do so (Hutchins, 2014-A).

Proposition 1: Biomimetic leadership helps teams harmonized as well as individuals harmonized.

Charles Darwin emphasizes the change: 'It's not the strongest species that survive, nor the most intelligent, but the most responsive to change.' (Robinson, 2010). In today's dynamic world organizations must be more aware towards environment. Uncertainty is one of the most remarkable characteristics of the future. Planning for uncertain future, especially in turbulent environments, is

becoming a luxury for companies. Organizational flexibility becomes as a strategic option (Volberda, 1998).

Flexible organizations have the power to live when there is a need for emergency like uncertain times (Syrett and Devine, 2012). A research in the 1990s about the importance of followership described the characteristics which make employees effective. Versatility is one of that characteristics. According to research, an organization environment must be a place where employees can participate in and initiate change; and in turn change must be seen as a challenging and rewarding part of the job. Versatility involves being able to deal with ambiguity (Lundin and Lancaster, 1990).

Biomimetic leadership can help to build flexibility. Nature's way to provide flexibility is to have diverse, decentralized and distributed ecosystem. That method may apply to business life (Hutchins, 2013-B). In that way organizations can find opportunities and solutions. So, we can formulate the proposition at below.

Proposition 2: Biomimetic leadership act as a catalyst to build flexibility (resilience).

According to Porter (1985), organizations can differentiate themselves through some activities. These activities are called core and support. Management infrastructure is one of these support activities. Management infrastructure contains all management process in organizations. If an organization success to create a different value for its customers, it will differentiate itself between the competitors.

There is no doubt that innovation can be a differentiator for a company, then is it possible to infer that if companies realize innovation, should they pay regard to leadership? Can leadership be associated to innovation types? And is it possible to mimic nature as leadership style?

Hutchins (2014-B), points out two types of leading: Fear-based leading covers; authoritarian, leader-follower relation, motivated by power, blame culture, risk avoidance, competitive, command and control featured management styles. On the contrary, courage-based leading covers; freedom, co-creative relation, motivated by love, compassionate culture, pioneering and improvisational featured management styles. The world we live in now is different than past. Companies have to compete in an environment where future cannot be seen easily. Both companies and the people in the organizations should feel themselves free to move. When an organization uses courage-based leading, there will be an environment where employees feel themselves free to create and share. Productivity will occur. Hence in a suitable work place, it will lead up to innovation. New products and services created through innovation can open organization new ways and increase income. A similar insight can be seen in relationship between creative leadership and radical innovation.

Radical innovation offers new benefits to the market. On the other hand firm can create new businesses. Therefore radical innovation involves high risk and high uncertainty in the firm (O'Connor and Ayers, 2005). If companies want to realize radical innovation, conventional leadership will not be enough for them. As De Luca (2014) points out conventional leadership is inadequate in increasingly interconected complex, unpredictable and volatile conditions.

Creative Leadership is a dynamic approach which continuslly maintains the common vision, values and goals, considers changing conditions, endeavours to create an environment that will enable dynamic snergisms and co-creativitiy by using nature as a model for leadership principles and practices, because evolution has yielded organisms that are responsive, adaptable, resilient

(De Luca, 2014). These observations about the role of leadership and innovation can lead to Proposition 3.

Proposition 3: A leadership style which uses nature as a model will help to create an environment which is suitable for innovation, including radical type. This will lead organizations to differentiate themselves in different directions.

Innovation

Innovation points a new idea where can be occurred as a product, process or service. As Mumford (2000) points out, the likelihood of innovation can be intensified by the individuals as well as management practices. Because it is the individual who is the source of a new idea. Therefore creativity of people should not be failed to notice. 'Post-it's innovation process come from a very different process which we probably may call it a miracle. Although at that time 3M scientists were trying to create tougher adhesives, one of these scientists, Dr. S. Silver discovered an adhesive which stuck *lightly* to surfaces. This adhesive was not one of the adhesives which they wanted to discover. In that period of time another 3M scientist, A. Frywas suffering from little scraps of papers which were falling out of his hymnal. Then he decided to put Silver's adhesive on a scrap of paper in order to mark his hymnal. They both achieved to create sometihng extremely useful: Post-it. (3M web site) It can be inferred from the Post-it case that variety of activities can enrich the creativity of people which is needed for innovation.

When considered for biomimicry, Janine Benyus points out Nature's Laws. One of Nature's Laws is diversity. Diversity has different sub-branches. One of them is redundancy. Here redundancy means that when a piece of a system cannot manage to accomplish a goal, other pieces of the system can accomplish the goal in different ways. (McHugh, 2011) If we adapt diversity to business life, diversity helps companies to build flexibility and to have optimized outputs (Hutchins, 2013-C). As seen in Post-It case, maybe S. Silver could not achieve a goal (a though adhesive). However for the new adhesive A. Frywas could manage to find an area of utilization by following different point of view which can bring us to diversity. We can infer that if companies are willing to open for innovation, they should hire different people who have different habits and traits. If companies investigate nature's diversity, they will have a chance to open new doors for innovation way. These observations about the role of having different activities as an employee and diversity law of nature can lead to Proposition 4.

Proposition 4: When companies take nature's diversity as an example, they will establish a creative environment for innovation.

Biomimicry is a kind of solution discovery for business problems. From this point of view, Gojo Industries used biomimicry to drive environmentally sustainable product innovation (Kennedy and Martin, 2016). As nature becomes a source of inspiration and as biomimicry is practiced in a deep way in companies, all processes including product/service innovation and development process have been affected by this view.

Proposition 5: Biomimicry can be a powerful design tool in order to support sustainability-driven product/service development.

Business Strategy and Strategy Formulation

All companies try to survive in their dynamic environment and to attain relatively higher performance than their competitors. This challenging struggle requires different strategies and strategy formulations. Since strategies make the companies different from each other as proactive or reactive. When we have a look strategy and biomimicry together, it is possible to establish some connections and relations between them.

Biomimicry is interested in how companies are inspired from nature. Therefore biomimicry is also concerned about all living creatures' lives and their strategies to survive. From biomimicry perspective, all companies can be considered like a creature. They want to be an infinite entity and have to survive for this objective. Here is a point that biomimicry perspective can help companies while formulating their strategies by finding similar things in the nature and matching the best sample for them.

First of all, biomimicry observes the nature and ruminate about that all living creatures act like an engineer (Benyus, 2002). From this perspective, we can say that biomimicry considers the nature as a self-solved, self-challenging and self-developed system because human engineers solve some technical problems, challenge to the environment, and develop their organizations with innovations by creating something for their companies. Similarly biomimicry design is inspired from the nature and offers some strategic solutions for companies.

Based on learning organization perspective, Senge (2004) suggests that system thinking is one of disciplines required to be implemented in learning organizations. Accordingly, business world and all human efforts are systems. They are connected with actions related to each other. System thinking cut through all operations of business environment by examining these actions and analyzing each part of whole system rather than understanding the whole system holistically. It provides us to see the whole clearer. From this point of view, we can say that organizations are open to learn how they operate, develop and survive in dynamic environment. They are like complex adaptive systems (Dargent, 2011) and try to understand the environment. For this, they inspire from the nature (as the largest system) and find survival strategic solutions tested before in nature. So, we can formulate the proposition at below.

Proposition 6: Biomimicry determines how a creature overcomes any problems that a company can face as well.

Since biomimicry means inspiration by nature, we can ask how companies inspire from the nature and use biomimicry thinking while formulating strategies. Companies seek for several ways to be different from their competitors. They try to attain sustainable competitive advantage for survival. According to Porter (1985), companies select either cost leadership or differentiation strategies. In other words, he positioned companies at the parting of the ways and force them to select one of ways. This requires systemic and planned strategies. However, to the biomimicry philosophy, companies should formulate harmonized strategies to act spontaneous and flexible. Companies are able to be at the optimum balance with this kind of strategies by staying at their ecosystems. Therefore, companies continue to live at their natural movement. This idea considers companies with their active environment (like an ecosystem) together and permits to shape each other. Because all creatures are related to their ecosystems.

Organizations are also looking for the best way to accomplish their goals. They can use some strategy examples from the nature. Nature has plenty of lessons to offer if we can understand

fundamental biological principles (Brennan, 2015). There is no one best approach to survive for all in nature since nature is a system flexibility-oriented. This contingency approach brings 'flexibility' concept to our mind. Flexibility is described as 'being open to unexpected problems and solutions because they contain the seeds of new development' (Morgan and Zohar, 1998). On the other hand, biomimicry can provide solutions that are better embedded and more in harmony with natural ecosystems (Szekacs, 2017). From this combination of organizational strategies and biomimicry, we can say that biomimicry thinking provides harmonized, multifaceted and conditional technics to organizations. So, we can formulate the proposition at below.

Proposition 7: Biomimicry encourages harmonized strategies by contrast with one-way strategies.

From the point of Porter's (1985) view, organizations also should avoid to be 'stuck in the middle'. According to the author, this situation creates strategic indecision. Hovewer today organizations need to go forward in two contrary strategies for survival and they start to be 'ambidextrous' (Duncan, 1976). The concept of ambidexterity has been extensively used to broadly refer to an organization's ability to perform differing and often competing, strategic acts at the same time (Simsek et al 2009). It also means a balance between exploration and exploitation. This balance can be supported by biomimicry innovation since nature is a kind of sum of all balances in the system.

Proposition 8: Biomimicry thinking may be parallel with ambidexterity logic.

Organization Structure

Does 'biomimicry understanding' affect the companies' organization structure? And how? We need to be establish some organic relations between biomimicry and organization structure to answer these questions. We bring forward our ideas based on system approach and consider this theory as a pre-assumption.

Biomimicry is based on organizing type of the nature as a criteria to understand companies. It tries to match the nature with disposition of companies. Because companies and nature have similarities in terms of dynamic balance and each partner's roles. In addition to this, collaboration and competition issues at the nature coincide at the company's as well. In a similar manner, relationships based on personal interest are seen obviously in companies as well as in nature. The more complex business causes the more relationships and collaborations regarding personal interests.

Organizations have rely on specialization of jobs since early 1900s by hinging on principles of classical management theory. Nature has a structure which is based on specialization as well. Each part of a system has specific responsibility about its task, thus the system is operating well. This similarity may be a starting point to establish a relation between biomimicry and management concepts in terms of their structure. On the other hand, not only nature but organizations have a tendency to build up networks to share common sources and to be a part of networks. Organizations care their social power and legitimacy as well as economic fitness. Such efforts are called legitimacy and it is a subject for institutional theory. To the theory, as organizations gain legitimacy in their social environment, they makes similar to each other and start to be isomoporhed. (DiMaggio and Powell, 1983). Just as organizations, ecosystem comprises many

kind of isomorphic processes as well. These similarities may create a chance to connect biomimicry and management concepts.

Proposition 9: Nature and companies have similarities in terms of structuring of organization.

As we said earlier, the starting point of system approach is a biological view. The system approach supporters consider organizations as a living and open system, which takes inputs from the environment, process and transform them, and send them back to the environment as output or waste. According to Burns and Stalker's (1959) classification, organizations are divided into two kind of structures: mechanistic vs organistic. Mechanistic organizations are close systems and not related with their environment. They are characterized by formalization, specialization, centralization and hierarchical. However organic organizations are open systems and be in interaction with their environment, can adapt and change, and therefore can defy the effects of entropy. They are characterized by decentralization, flexibility, adaptiveness to changes, low specialization and horizontal communication. There are some departments of organic organizations providing flow of information with the environment via many ways. These departments are called as peripheral units. Having a look the structure of the nature, we observe similar characteristics that are relevant to adapt, change and survive. According to population ecology (Hannan, Freeman, 1977), although there is a wide variety of ecological perspectives, they all focus on selection. That is, they attribute patterns in nature to the action of selection processes. Given that biomimicry is a benchmarking from the nature, it is possible to be able to explain nature and managerial concepts together considering structural form. From this perspective, it can be considered the nature as an enormous organic organization.

Proposition 10: Biomimicry matches the nature with organic organization.

The nature tries to eliminate all waste. It has no stocks because it is self-producing continuously when needed. Its self-producing nature resembles with just-in-time production as a tool of total quality management practices. The principles and law of the nature are also simple. All these features of the nature overlap characteristics of companies. Organizations can be considered as mimic living systems. Organizations try to be lean and simple to avoid waste activities as well (Womack and Jones, 2003). It is also about rightsizing issue. Organizations are in the search of optimum size for their activities. As they have complexity, the probability of entropic effects increases. To defy the effect, companies choose simple, standardized and lean processes for operations. Paradoxically being lean provides organizational robustness for organizations. This idea is valid for the nature's robustness and power as well.

Proposition 11: Mimic living systems require to be lean organization.

Nature and creatures show self-replicating ability. Adaptation to change is a necessary for survival. So, all living creatures such as animals, plants, unicellular, try to adapt to their environment. For this reason, they renew their existing capabilities. Like this, organizations try to update their business manner, business models, product services, production systems and even cultures to the changing environment. According to Camilleri (2017), the nature is a closed loop system and circular economy will be an approach taken by companies and managers. As biomimicry is seen

as mimics the form, movements and systems of nature, we can bridge the gap between structure of the nature and companies.
As organizations can be seen as open systems, need of qualities such as cooperative self-organization, self-reliant local adaptation and managed boundaries (Dargent, 2011) are increasing to improve design ability and make innovations. Through many innovative goods and services, organizations start to become self-created, self-produced and self-generated. Like organizations, the nature is a huge self-regulating system and includes several mechanism for operations of the system.

Proposition 12: Organizations are self-replicating organisms in the business environment.

As a summary, all propositions of current study are written in a coherent flow. First of all, leaders were examined in detail since they are one step ahead of their followers and organizations. Biomimicry encourages leaders to be team harmonizer, flexibility creator or have different style to engage in their jobs by inspring from leaders and team functionality of nature. Secondly, we discussed the innovation, the most essential issue for today's business world. Since biomimicry is described on the basis of innovation before, it is inevitable to mention about innovation and biomimicry relation. Biomimicry provides companies to innovate much more, more diverse, more creative and more sustainable. Thirdly, business strategy was addressed as another issue which organizations pattern from nature. It was examined in terms of mimicked features (solution-driven, harmonized and ambidextrous) by nature. Finally, organization structure was related to biomimicry. We concentrated on structuring similarity between nature and companies and then we indicated these similarities as being organistic, lean and self-replicating systems.

Discussion
When he pointed out 'industrial ecology' Kevin Kelly tried to answer a question; "Are you sure that will industry work well with nature?". When he tries to find an answer to the question, one of his interpretations attracted attention; "In technology we see that the more we make processes more biological, the more they are secure for people and environment." (Kelly, 1997).As Kelly points out, technology has lots of things to learn from biology. Biology is an important part of nature. Today we should see the whole picture; nature. If we do not do business in spite of nature, there will be a win-win situation. Biomimicry can be a universal language that can be used by organizations in order to build business future.
Despite the fact that new product development is the most common output of biomimicry, the discipline has much more than this. Business people can make use of biomimicry by using nature's principles in order to create new business models, to answer core business questions. There is a famous example; when Philips Research decided to enter a new area which is Open Innovation, they asked "How can we stand in a new business area and expand in that area?". When biomimicry professionals converted this question into biomimicry language, they found the answer hidden in collaboration. When there are two species fighting for the same hunt, competition shows up. However when they collaborate, the results become more positive. When collaboration strategies in nature are searched, it is seen that different species that have different strong powers make collaboration. Here the result from analysis becomes that a brand should make a collaboration with another companies that do not resembles themselves (Arhon, 2012).

Biomimicry provides the platform for business innovators, managers, employees to have a look to the nature and generate ideas based upon its solutions. We tried to highlight the linkages business movement in new area oriented the nature and assess these linkages in terms of some managerial concepts. This may improve companies' ecological approach and make them to see the environment as the most important source. Nature is not a sum of scarce sources as if only it can be as a source of inspiration. Biomimicry brings with eco-design view for management of companies.

We brought some propositions about the relationship between biomimicry and managerial concepts. We tried to correlate leadership and biomimicry in terms of harmonized individuals and teams and flexibility and courage ability of leaders. With regard to innovation, biomimicry is a powerful driver to accomplish and sustain innovation processes. And biomimetic leadership will provide an environment that is suitable for any type of innovation. On the other hand, biomimicry is a relevant concept of being an open system of companies and a significant tool of strategy formulation. Finally organization structure is linked with biomimicry in terms of being organic, lean and self-replicating.

This study addressed a conceptual view and suggested that biomimicry as a toolkit which pushes the survival process of companies. It is expected that this study is important because literature lacks of studies regarding this linkage, especially in management field. For future research, these propositions can be extended and developed for other managerial concepts such as institutionalism, organizational ambidexterity, isomorphism etc. Another suggestion for the future researchers to carry out qualitative research. Expanded examples will allow to support the propositions as well as to provide basis for quantitative analysis.

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