

Innovation from a Memetic and Evolutionary Perspective

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Abstract: Innovation happens all around the Universe and is a fundamental mechanism of evolution. Living creatures cannot but exist and develop through innovation. Innovation happens through mutations that make sense in retrospect only. Natural selection makes certain mutations as beneficial and other as something that was already forgotten. As much as genes serve as quantized smaller units where innovation takes place in physical bodies, memes serve as basic quantized units of human culture. Memes as second replicators to genes obey similar laws of evolution and thus innovation as genes. Innovation can be propagated only by removing obstacles on one side and by allowing mutations to emerge as long as they do not destroy identity.

Keywords: gene; meme; natural selection; innovation; evolution

JEL classification = JEL klasifikacija: B52

Inovacije z memetične in evolucijske perspective

Povzetek: Inovacije se dogajajo po celotni vesolju in so temeljni mehanizem evolucije. Živa bitja ne morejo obstajati in se razvijati brez inovacij. Inovacije se dogajajo le z mutacijami, ki so smiselne samo v retrospektivi. Naravna selekcija naredi določene mutacije kot koristne in druge kot nekaj, kar je bilo že pozabljeno. Kolikor geni služijo kot kvantizirane manjše enote, kjer se inovacije odvijajo v fizičnih telesih, so meje služile kot osnovna kvantizirana enota človeške kulture. Memo kot drugi replikatorji za gene pokrivajo podobne zakone evolucije in s tem inovacije kot geni. Inovacije se lahko razmnožujejo le z odstranitvijo ovir na eni strani in z omogočanjem pojavljanja mutacij, dokler ne uničijo identitete.

Ključne besede: gen; meme; naravna selekcija; inovacije; evolucija

JEL klasifikacija: B52

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How to cite this paper = Kako citirati ta
članek: Drapal, A. (2019). Innovation
from a Memetic and Evolutionary
Perspective. *Mednarodno inovativno
poslovanje = Journal of Innovative
Business and Management*, 11(1), 11-15.
DOI: 10.32015/JIMB/2019-11-1-2

Received = prejeto: 10.9.2018

Accepted = sprejeto: 11.12.2018

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Mednarodno inovativno poslovanje =
*Journal of Innovative Business and
Management*
ISSN: 1855-6175

1 Argument against conscious innovation

Innovation is an appropriate buzzword of the competitive market economy. "Innovate or die" is proved daily not only in manufacturing and service industries, but more and more in all other fields of human activities, education, healthcare and even public administration. In short: innovation as imperative takes place in each human activity that is subject to competition. Students have to be innovative in competition for the highest ranks among all students that strive to be first, since everyone knows that those on the top of the ladder are going to cash out in prestige and compensation while the rest are going to toil to sustain or are, in the worst case, going to be expelled from the field.

There is no need to give examples from all other fields of human activities to understand that innovation is much more than a buzzword of competitiveness in the market economy. While there are many books, course gurus and similar aids to companies and individuals that promise to develop the ability to innovate faster and better, this paper focusses on the very basic questions of innovation like:

- what innovation really is
- what innovation innovates (what is the object of innovation)
- who or what is the agent of innovation?

1.1 Evolution

There is no need to wait for the murderer until the last chapter. Since humans as apparent agents of innovation are the result of more than 4 billion years of evolution on Earth and of around 400.000 years of humanoid existence, evolution is "the place" where innovation happens. Evolution is nothing but the result of a series of innovations taking place in living matter occupying Earth.

The last sentence is so obvious that it needs further discussion through the following questions:

- What is "living matter" and where in living matter does innovation really happen?
- How does innovation of living matter happen?
- Does innovation confine itself to living matter only?

According to contemporary biology and the theory of evolution, best represented in a series of books of Richard Dawkins from 1976 to 2002 (though a majority of contemporary evolutionary biologists share his views to a large degree) evolution happens in the form of mutation. Mutations as a result of accidental mistakes in the genetic code copying process change the genetic code over time in such a manner that they "produce" changes in phenotypes as well. Phenotypic changes (e.g., larger brains, whiter skin, smaller jaws) make creatures more or less prone to survive in a changing environment. It is in fact the environment that "forces" phenotypes (bodies) to adapt and thus phenotypes "force" gene codes to change.

It does not really happen that way. It is not the phenotype that would force a gene to change and it is not the gene that would directly change the phenotype. It is natural selection that selects those changes in the interplay between genotype and phenotype that prove to be most sustainable, most competitive in the changed environment. There is no agent that would force this or another change either in genotype or phenotype. Mutations happen randomly. Mistakes in the copying process happen as much as our typos happen randomly. Selection of the fittest happens afterwards. Gene "a" in a body "A" changes in direction "x". Gene "b" in a body "B" changes in direction "y". Typo. Random event. But then due to changes in the environment over time the offspring of A flourish while the offspring of B strive, do not reproduce and eventually disappear. From that perspective, the now random mutation of A becomes innovation while the random mutation of B becomes failure.

This simplified, but correct, explication of innovation that evolution brings forth points to another important concept that enables us to understand the process of evolution better and with that also any process of innovation. Stuart Kaufmann's (Kauffmann, 1993, 2000) concept of the fitness landscape helps us understand the blindness of the evolutionary process better. Imagine yourself walking on a terrain you do not know and not having any map of it. You only know that it is a better chance for you to survive if you are higher than if you are lower. So, you choose the path that leads you up. But when you step on the peak of the hill you realize that you have to descend first to the valley below if you want to proceed to an even higher peak seen from where you are standing, while it would be much better

if you have chosen the valley path beforehand. But you also realize that you cannot be sure that the highest peak you see is really the highest peak and not only a distraction on a path to even higher peaks. For you do not know what the configuration of the landscape is, and you even do not know what the highest point on that landscape is.

The lesson from evolution is thus that innovation cannot be planned in advance. Innovation happens as a mistake. Only later events make such a mistake either an innovation or a mistake. This rule does not apply to innovations of living creatures (bodies) but to all possible innovations. One quite simple but often marginalised cause lies behind the explained blindness of evolution: complexity of environment. It is not only you that innovates/mutates/changes, but all other agents as well. Not only do you not know what the landscape you are traveling on is, but that the landscape representing your environment changes all the time. Each agent of that landscape represents a part of the changing environment for all other agents. As a matter of fact, you are a part of that same landscape from the perspective of any other agent. You do not travel on that landscape; you are that landscape and you are constantly changing that landscape. Complexity of interactions is so vast that it produces emergencies. Evolution itself is one such emergency.

This paper has come to the point that is perhaps one of most baffling issues of science from Charles Darwin's discovery of the laws of evolution: living creatures and humans among them are definitely the stuff that evolution plays with but are definitely not agents of that evolution in the sense in which we understand agents' properties. It is clear that we as living creatures do not change anything. We certainly act. We certainly act with the purpose of improving our fitness. We live as much as we counteract entropy as Erwin Schrödinger proved so nicely (Schrödinger, 1967). But we are far from being agents on the evolutionary course in the sense as we understand agents in our everyday experience. An agent moves a chair from one position to another. The goal of that agent is fulfilled when a chair settles in a new position. Nothing alike is accomplished in evolutionary course.

It was again Richard Dawkins (Dawkins, 1976) that introduced the real agent behind all evolutionary events. The gene. The selfish gene. It is a gene that uses (abuses) us for the purpose of its propagation/reproduction. Genes have developed all kinds of tricks (phenotypes) over evolution to serve as vehicles for survival and reproduction. All innovation that we as phenotypic bodies produce thus serve nothing but the fitness of the real agent: genes. It is true that genes could not survive without bodies/phenotypes, but the agency lies there, not here.

Note that agency has nothing to do with consciousness. Even more, consciousness is just another phenotypical genetic trick for it to survive. Consciousness is an emergency of complex brains that enables bodies possessing consciousness to be more competitive and thus allow genes inhabiting them (as viruses) to have a better chance of survival (Dennett, 1991).

1.2 Memetics

We rightfully understand innovation in contemporary society as a result of our conscious activity. We innovate with our minds first and then transcribe what was conceived in our minds into the physical realm as products or service innovations. The question of the relation between nature and nurture in human evolution persists from the most ancient written heritage. From Gilgamesh, Aristotle, Buddha to Steven Pinker (Pinker, 2003) the question of whether nature or culture has a higher impact raises fierce discussions among proponents of various schools of philosophy. It is not the goal of this paper to dwell deeper into this controversy since it was already well resolved by the mentioned Steven Pinker.

Since innovation is the subject of this paper, we have to answer the question of how innovation happens within the realm of "culture". Innovation on the level of physical living bodies from protozoa to humans is well defined by genetics. What really upgraded Darwin's theory of evolution was namely the quantization of change enabled by genetics. Genes served as observable quants of change and with that so far analogue flow was digitalized, informatized.

From 1976 on we fortunately have the option to quantize culture as well. Quants for culture are called memes. Memes were introduced in the last chapter of Richard Dawkins *Selfish Gene* (Dawkins, 1976) as second replicators to genes. According to Dawkins, memes follow the same rules that define replication of genes: longevity, fidelity and fecundity. Memes that reproduce in higher quantities (fecundity), with higher accuracy (fidelity) and can live longer (longevity) tend to be more important in evolution. One such meme is, for instance, the meme of Christ that is reproduced daily, lives for more than two millennia and has efficient fidelity.

The question of fidelity is crucial for innovation, but for now let us compare a meme of Christ with a meme of planking. Planking became extremely viral in 2010 and 2011. A planking meme spread from Australia almost all around the world. But after 2011, there was almost no more planking anywhere. A meme is still around, but it does not replicate much. We can easily assume that the planking meme disappeared almost due to the fact that it did not allow mutation. The meme could not evolve. It stayed the same in a changed environment, so it has lost its competitiveness.

This paper intentionally jumped from the history and justification of memetics to phenomenology of memetics. But who says that memetics holds true? Not only did Richard Dawkins himself abandon memetics in his later works in the most astonishing way, he did not refute the memetic as explained in *Selfish Gene* but forgot it as if it was not put on paper. Sigmund Freud would have something to say about such an omission. Even so, more because the whole of Dawkins work after 2002 is devoted to two memes only: science and religion. Should he take his own theory seriously, it would not take much effort to evaluate the evolutionary role of religion in parallel to that same scientific role.

If there was not the work of Susan Blackmore, and especially her book *The Meme Machine* (Blackmore, 1999) the meme would disappear as much as planking, for instance. There are a couple of other authors besides Susan Blackmore working on the evolutionary role of memes as quanta of culture, but her work is still pivotal. She proved that so far blurry analogue culture and cultural heritage, and all similar intangible stuff could in principle be quantized, informatized. The evolution of the human mind as memetic quanta living on the substrate of human brains became possible. And for our purpose also an option to understand innovation as memetic activity better.

Human culture including language, institutions, fashion, art, myths, etc., evolved in the same fashion and for the same purpose as beavers developed their teeth and dams, phenotypes and extended phenotypes, according to Dawkins' Extended Phenotype explanation (Dawkins, 1982). Cell phones as extended phenotypes of humans and serve the same function as dams for beavers. But cell phones are much more than that. They help us propagate memes. They are true meme machines that secure longevity, fecundity and fidelity of memes as quanta, as bites of information, as distinct chunks of culture that have the ability to reproduce themselves using us as vehicles.

This brings us closer to the last important issue of evolution, memetics and innovation: auto creativity, self-propagation. As I have explained and hopefully proved in another paper, to be published soon, *Fake News and Construction of Reality*, memes do not reflect reality but construct reality. Memetics has nothing to do with Aristotelian mimesis. Memes are auto-poetic. The Myth of Moses burning bush does not serve as a tool to know what really happens, but as a tool for our better fitness now and in the future. Alike science does not explain physical reality for the sake of knowledge, but for our know-how. For that reason, it is not frustrating that quantum mechanics proves that physical real is impenetrable. Elementary particles are proved to be highly evasive. They are at the same time waves and particles. They can be here and there in the same moment. With each further advancement of science, we are more and more aware that it is impossible to reduce the Universe to one principle, to one cause. We are more and more aware that the Universe is not a deductible entity but something that is reconstructed, reinvented with each new insight. The famous Karl Marx 11 thesis on Feuerbach is completely refuted by contemporary science. He claimed that so far "philosophers have only interpreted the world in various ways, the point is to change it" (Marx, 1845). On the contrary, no one, not even philosophers, can interpret the world. We can only change it. We are changing it with each of our actions, especially with meme manipulation.

The conclusion regarding innovation is now quite obvious: we cannot but innovate. Life itself is innovation only. Not to innovate means to surrender to entropy. Entropy pushing towards perfect equality of all particles is a path towards death. Life goes in the opposite way. Innovation enhances inequality, enhances distinctions between different identities. Innovation makes each identity stronger for the purpose of strengthening its competitive advantage.

2 Methods

The methodology of this paper rests on the only possible empirical study within memetics: thought experiments, argumentations and consistent reasoning based on neuroscience, physics and the philosophy of evolution. This paper uses memetic heritage of mentioned, but also many unmentioned, authors. Apart from one or two direct citations, all other references are poetic. For, as this paper proved, no other type of reference can exist. All mentioned authors are no more in possession of what they wrote about. As such, the words (memes) of this paper are not the property of

anybody. Memes using and abusing already established memes reproduced by mentioned authors of this paper create a new reality. The only aim of an author can be to abuse used memes to propagate a meme of an author. As Susan Blackmore put so clearly: memes as replicators became in many respects more important for human evolution as genes. Memes are our Brainchildren, as is also the title of one of the essays of another great philosopher, Daniel Dennett (Dennett, 1998).

3 Discussion

It is quite obvious that this paper is highly controversial from the standpoint of present social studies and the orthodox line of cultural studies. Taken from the perspective of evolutionary theory, quantum mechanics and neuroscience results are quite contrary and trivial. This paper should thus be understood mainly as a plea to social scientists and humanists to take philosophy and other sciences into account when discussing their issues. Human issues are integrated. Philosophy as a memetic activity that encompasses (better: should encompass) all sciences and all human activities outside sciences establishes the only possible playground for ensuring the focus of both the wood and trees.

4 Conclusion

If innovation is, as explained in this paper, so ubiquitous on one side and so random on another, then we should seriously reconsider all our activities that aim to foster innovation. Innovation needs no additional pushes. We cannot activate innovation; we can only deactivate it. What we can do is remove obstacles that prevent random auto-creation of a memetic environment and with that innovation.

On the other side it is clear that we cannot steer innovation. Innovation happens as a mistake. Better: innovation happens after some mistakes out of many prove to be beneficial. Innovation follows the natural selection principle. Resources put in place to enhance innovation and to develop better selection tools for innovation are wasted. Resources put into place to make people more self-responsible, less burdened by guiding rules (with less obstacles preventing them to be what they are by human nature and by laws of evolution) and resources to open the flow of changes wider are beneficial.

There is one warning that has to be clarified in relation to the flow of mistakes. A warning comes out from the rule of identity. Each identity has a certain threshold of mutations. Too many mutations threaten to change identity. This threat is similar to cellular or genetic mutations. No mutations on one side lead to sure extinction due to incapability to adapt to changes in the environment. Too many mutations can result in chaos similar to cancer. So, the only real task of an innovation propagator within entities that want to enforce the innovation process is to safeguard identity on one side and to remove obstacles on another. The first one belongs to the branding process, and the second to the building of responsible individuals.

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