



Editorial – Issue 34 – April 2021

The evolution of society is often catalysed by adversity. We are experiencing a time that seems to be proving this phenomenon. When adversities are not present in a significant manner, we tend not to use all the potential that technological development provides us. We could have a more daring stance, but we tend to wait for a while, until the risks of change decrease. Consequently, in the absence of adverse conditions, it takes some time to adapt to the new scenario that technology produces. Many educational areas, for example, once limited, sometimes even forbade, distance learning. Today, distance learning seems to be the only way out. When we find ourselves at a crossroads, our fears of certain choices or decisions vanish. We are literally obliged to adopt a new stance.

In these circumstances, the following question may arise: if, when looking back, we realize that adversity led us to evolve, why did we not make this evolution happen before? There are a few possible arguments. One of them concerns the risk of abandoning a process that is working in a fully satisfactory way and adopting something uncertain. Another possible argument is that we may not have the proper stance and customs to promote evolution. We may not be paying attention to our survival in the future, but only taking care of the immediate dangers. In other words, it is possible that we are not investing in innovation as we should, and this mistake can be fatal.

As we know, evolutionary biology makes use of four types of genetic variation, without which we would not be what we are today: heredity, natural selection, recombination and mutation. Making a comparison between evolutionary biology and technological innovation, we can clearly see some interesting similarities. A company, for example, has its own work culture, an inheritance from times gone by, sometimes even from the remote past. As we can see from the way companies are born, last for a while and then die, there is a mechanism that determines the fate of companies, similar to natural selection, a process by which the fittest survive and that ultimately defines the shape of the population.

Let us now proceed to clarify the two remaining variations, recombination and mutation. Recombination is essential in the generation of individuals with slightly different characteristics. Two chromosomes interact and exchange part of their genetic material with each other. In the technological realm, something similar occurs when we produce an incremental innovation, for example, a new product based on existing technology, but which makes use of it in an innovative way, recombining it and producing an application that brings value to the company. In fact, companies evolve by making this type of change in their framework, and this can affect their survival in the market. As long as they are able to carry out such innovations, they will be able to acquire a competitive advantage and thus guarantee their future, at least in the short and in the medium term.

Genetic mutation is similar to radical and even disruptive innovation. Radical innovation occurs when a completely new product is developed from new knowledge. Disruptive innovation, in turn, is not limited to a new product, but promotes the rupture of paradigms, changing the way things are done, creating, for example, a new consumption habit. Many people wonder how a company can be so innovative as to change the market. How do they manage to do this? The answer is simple: they trust the evolutionary process. They are aware that the mutation is an extremely important variation in the process. In the business world, we could refer to mutation as experimentation, that is, the dedication of time to explore possible new paths.

Some of these paths go wrong, that is, they do not survive when tested by natural selection. Others do work, providing a sustained competitive differential to the company. Very few others can simply change the world in the context of the company's market. Everyone who invests in innovation knows that, of all initiatives, only a few will work. More than that: they know that, perhaps, at some point in the timeline, an opportunity will arise, within their framework of experiments, to change the world. Those that do not invest in mutation will never change the world. There is no miracle. Those that invest in incremental innovation will certainly have interesting advantages over the vast majority of their competitors. Those that do not invest in innovation, we are sorry to say, will die, because the process of natural selection is relentless.



Much of the work published in this journal is dedicated to issues within the Brazilian electricity sector, of course. The R&D programme promoted by the Brazilian Electric Energy Agency (ANEEL) is one of the major vectors of technological innovation in the sector. Technological innovation, as we know, is not limited to those results produced by R&D projects, but rather encompasses a vast diversity of enterprises. However, once R&D creates new knowledge, it is evident that disruptive innovation, in practice, is unlikely to find space in another type of activity. We have clearly noticed, in the electricity sector, a tendency to shift the focus from the R&D programme to initiatives that, although important, will never replace the role of scientific innovations in the sector. They are the ones who can provide sustainable competitive differential and guarantee the sector's survival and evolution.

This issue of Espaço Energia, after the traditional and rigorous scientific evaluation process, which counts on the expertise of the most renowned scientists in the sector, brings us three very interesting papers. The first deals with the issue of determining the life cycle of batteries, which, as everyone knows, have acquired an important role in the energy sector, based on technological developments. The second paper is an extremely interesting analysis, authored by two very active collaborators of the journal (it is reiterated here that their paper went through the same double-blind reviewing process), which deals with the issue of investment in hydroelectric plants with reservoirs, which represent one of the safest and cheapest energy production arrangements, in addition to having the least impact on nature (some, many claim, even bring benefits when it comes to socio-environmental aspects). The last work deals directly with issues related to the decrease in energy consumption through a proposal for the management of consumption based on the intensity variation of LED type luminaires, a process referred to as LED dimming.

On behalf of the editors of Espaço Energia, as well as all collaborators, including the authors, I wish you a good reading. May the works published here contribute with new ideas, so that we can be prepared for the challenges of the future and thrive in our natural selection process.

Klaus de Geus
Member of the board of editors