



DARWIN'S DARWINISM FOR DIGITAL DARWINISM AND MOVING AHEAD WITH DIGITAL TRANSFORMATION



CMA (Dr.) Paritosh Basu

Senior Director (Services)
Stragility Consulting Pvt. Ltd.
Mumbai
paritosh13286@outlook.com

Introduction – Evolutions and Extinctions

Scientists have always been overwhelmed by total number living species that have ever lived in earth. Their estimates have varied as widely as one can imagine with wildest stretch. Encyclopaedia have reported that the number have ranged between 3 to 30 million species of plants, animals, bacteria, fungi, algae, single cell living elements, etc. However, only 1.2 million have reportedly been identified and named so far, and the most of those are insects.

While many of such species have helped each other to survive and thrive in the chain of nutrients, certain species have consumed others away as food. Many living elements have evolved over millions and thousands of years and gradually improved over their previous generations to survive in the everchanging environment of earth. The greatest example is mankind. Some could not adopt and adapt and the inevitable has happened through natural extinctions.

But certain stories of extinction are different like that of the non-flying Dodo birds of Mauritius. One school of researchers is of the view that people from other countries carried dogs, cats, monkeys, and other pet animals for co-habiting. Dodos of that tiny island could not adapt for co-existence and reproduction. It is thus a story proving the old maxim 'survival of the fittest'. The other view is that those migrants have eaten away Dodos since there were shortage of eatables.

The third major reason for extinction is indirect. For industrialisation and urbanisation mankind has not followed any regulation, ruthlessly exploited nature, and severely disrupted environment. This is continuing to cause global warming and disbalance biodiversity. Animal kingdom is under severe threats due to deforestation and wildfire.

Image Source: <https://nttdata-solutions.com/us/services/digital-transformation-as-a-service/>

Even honeybees are alarmingly reducing due to natural calamities. Ultimately survival of mankind is also being feared to be shrouded with uncertainty.

Objective

The primary question is whether such stories can be linked and corroborated with what all has happened so far with digital technologies in this short span of about thirty years of present industry 4.0 era. Should lessons be learnt, and cautions be exercised so that painstakingly created digital technologies can be nurtured to survive, evolve, and move ahead for pervasive and inclusive happiness of humanity? The point that may cross many readers' mind that answers may be lying in 'Darwin's Darwinism'. The author also through so.

There were plenty of criticisms and oppositions from scientists right in Darwin's own time after he propagated the theory of evolution. Many of them have also provided alternate views. Even philosophers had also commented on Darwin's theory. Despite their being such criticisms, since about last 16 decades researchers, irrespective of the nature of their fields of research including even management, have referred to Darwin's theory if confronted with any issue related to evolution and extinction. The objective of this article is also the same. An attempt will be made to first understand what Darwin's Darwinism briefly is. Thereafter the author will try to write about certain contemporary developments in the field of digital technologies and digital transformation. Objective would be to corroborate whether those have happened following the guiding lights from the five pillars of theme related to Darwin's theory of evolution.

Darwinism

The above stories of survival and extinctions in the ultimate analysis establish one fact that any living specie, that have ever lived on earth, had to remain under existential threats from other species and always had to strive hard for survival and growth. Many are continuing to do so. Again, survival is dependent on enduring pains and consistently evolve with better capabilities to adapt, adopt, and struggle. Hence species that are presently living have evolved with unique attributes and differential capabilities to fight, reproduce, survive, and thrive. Perhaps all these had led Charles Robert Darwin, an eminent English naturalist, geologist, biologist, and cerebral thinker, to theorise his own ism called Darwinism in his famous book '*On the Origin of Species*' in 1859.

Stanford Encyclopaedia of Philosophy¹ writes that, "*Darwinism identifies a core set of concepts, principles and methodological maxims that were first articulated and defended by Charles Darwin, and which continue to be identified with a certain approach to evolutionary questions.*" The fundamental and pivotal point of Darwin's theory is the "*The nature, power and scope of selection*".

This phrase had created baffling impacts in minds of Darwin's contemporaries and scientists till date.

Encyclopaedia Britannica² has defined this phrase, "*natural selection, process that results in the adaptation of an organism to its environment by means of selectively reproducing changes in its genotype or genetic constitution. increase an organism's chances of survival and procreation are preserved and multiplied from generation to generation at the expense of less advantageous variations. Evolution often occurs as a consequence of this process.*"

Readers may be puzzled at this stage why under the Column named 'Digital Transformation' Darwin's theory of evolution is being narrated despite there being very many criticisms right from Darwin's own era. But it is a common knowledge that Darwin's theories explaining evolution of living species and their survival by mutation have also been applied to many inanimate substances and creationism. His theories have also helped thinkers to appreciate how any object of any field is connected and impacted by various objects and developments in related fields in terms of impacts on evolution, procreation, mutation, and survival.

Researchers on general management has also adopted and applied the themes of Darwin's Darwinism for analyses of reasons behind demises of Fortune 500 companies because organisational genomics comes into play. It is popularly said that with changes in leadership positions operating strategies may change within a short while, but it takes several decades for genomic characteristics of the organisation to change which have been inherited from a series of previous CEOs and CXOs. Demise of large organisations, like Kodak, Polaroid, have testified that failure to believe and adopt changes is the single most root cause.

Cappgemini in their research-based publication titled '*Volatility and Corporate Darwinism*'³ has written that, "*Since 2000, 52% of companies in the Fortune 500 have either gone bankrupt, been acquired or ceased to exist. US corporations in the S&P 500 in 1958 remained in the index for an average of 61 years. By 1980, the average tenure of an S&P 500 firm was 25 years, and by 2011 that average shortened to 18 years based on seven-year rolling averages.*"

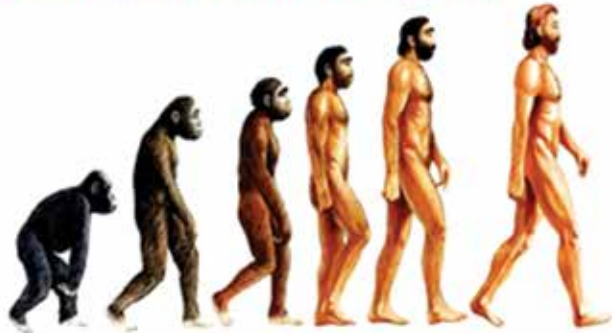
Readers can observe that survival period of such companies has reduced by about 70% in a span 53 years, i. e., by an average of about 1.32% every year. Two major reasons of such crisis of existence, as quoted by Cappgemini are, "*In most organizations, decision cycles lag technology cycles. organizations becoming complacent is management inertia – failure to sense the need to change.*" The lag in decision cycle indicates that both top leadership team and board of directors of those companies failed to keep pace with time, foresee changes, adapt, and adopt with changing dynamics of technology and business ecosystem. Lack of foresight has also severely hindered

their ability to proactively achieve a state of readiness for coping with the negative impacts of dynamic environment and thus evolve by coping with changes,

In the domain of science and technology-based companies it is a common event. Business leaders could not in many cases even believe themselves, rely on their own innovations and discoveries, not to speak of foreseeing the inevitable of future. Otherwise, Kodak would have not failed. After having discovered digital photography and having most of the patents for that, they did not commercialise it. Kodak

continued to deal on paper and chemical-based films and led their company to its coffin. This by all probabilities justifies Darwin's second pillar of theme for evolution, '*The nature, power and scope of selection*' as listed in the following graphic. This also proves the fifth pillar '*The tempo and mode of evolutionary change*' If one specie, (please read as management group) does not know how to survive by understanding and appreciating the evolutionary changes, others will recognise that, adopt, adapt, and eventually drive the first group to extinction.

Five Themes of Darwin's Darwinism



- Probability and chance
- The nature, power and scope of selection
- Adaptation and teleology
- Nominalism vs. essentialism about species
- The tempo and mode of evolutionary change

Sources:

Picture: <https://www.linkedin.com/pulse/human-evolution-tradition-software-development-kai-stevens/>
Themes: <https://plato.stanford.edu/entries/darwinism/#:~:text=Darwinism%20designates%20a%20distinctive%20form,Origin%20of%20Species%20in%201859>

This doctrine is proved by the fact that telecommunication companies adopted new technologies have evolved over the years. The technology has recently entered 5G or the 'Fifth Generation' era. The story right from the invention of Alexander Graham Bell in 1876 to introduction of the first cellular phone by Nippon Telegraph and Telephone in 1979 speaks volume of both the second and fourth pillars of Darwin's theme. In course of this development one entity called Nokia, once the king of wireless handsets, has been overtaken by Samsung and Apple using Android and iOS technology. Research and development activities and such recognition of outcomes therefrom by forward-looking companies proves Darwin's last theme, '*The tempo and mode of evolutionary changes*'.

Again, the technology for world wide web (www) has now reached Web 3.0 to which have converged for collaboration many digital technologies like blockchain, AI, AR, VR, etc. Readers may refer to the authors' article⁴ on these subjects which was published under this Column in October 2022. Such integration of ICT and digital technologies have brought in overwhelming changes in the present Industry 4.0 era. This phenomenon that confirms collaboration and cooperation between entities in two or more technology domains have also helped them to survive and grow.

Digital Darwinism

There is no scope for argument that the overwhelming speed of changes in digital technologies, their adoption, and applications for transformation of business and even governmental services are continuously influencing people's way of living life. Some of those technologies have also started taking over routine and repetitive tasks of human beings. All these are not only happening and impacting life but also gaining momentum with quantum leap at shorter intervals in qualitative terms and newer applications. Digital transformation is also solving latent demands of society for solving complex problems.

In the context of the theme of this article, therefore, it would be useful to examine whether there is a scope to testify and apply 'Darwin's Darwinism' at each step. Objective should be to pick up learning points to ensure better results from what all are being done to ensure sustainable prosperity and avoid extinction of both technologies and mankind. One may also add deterioration in unique capabilities and qualities of human being. Extinction of less effective technologies would be good for humanity if better technologies evolve from previous ones.

The author is of the view that it is an imperative for all to think through whether stakeholders of digital technologies must keep in mind the learning points and wisdom that has emerged from applying 'Darwin's Darwinism' in other

domains, including management. A few examples of those related to life science have been narrated in introduction segment.

It is generally accepted by all without much of arguments that digital technologies are also continuously evolving. Hence at this juncture it would be useful to revisit two words, viz., ‘evolution’ and ‘Darwinism’ to appreciate what exactly those indicate from the perspective of ideal and widely acceptable meaning. Reference to Oxford Dictionary reveals the following:

- ⊙ Evolution (mass noun) = *“The process by which different kinds of living organism are believed to have developed from earlier forms during the history of the earth.”*
- ⊙ Darwinism (mass noun) = *“The theory of the evolution of species by natural selection ... Darwin argued that since offspring tend to vary slightly from their parents, mutations which make an organism better adapted to its environment will be encouraged and developed by the pressures of natural selection, leading to the evolution of new species differing widely from another and from their common ancestors*”

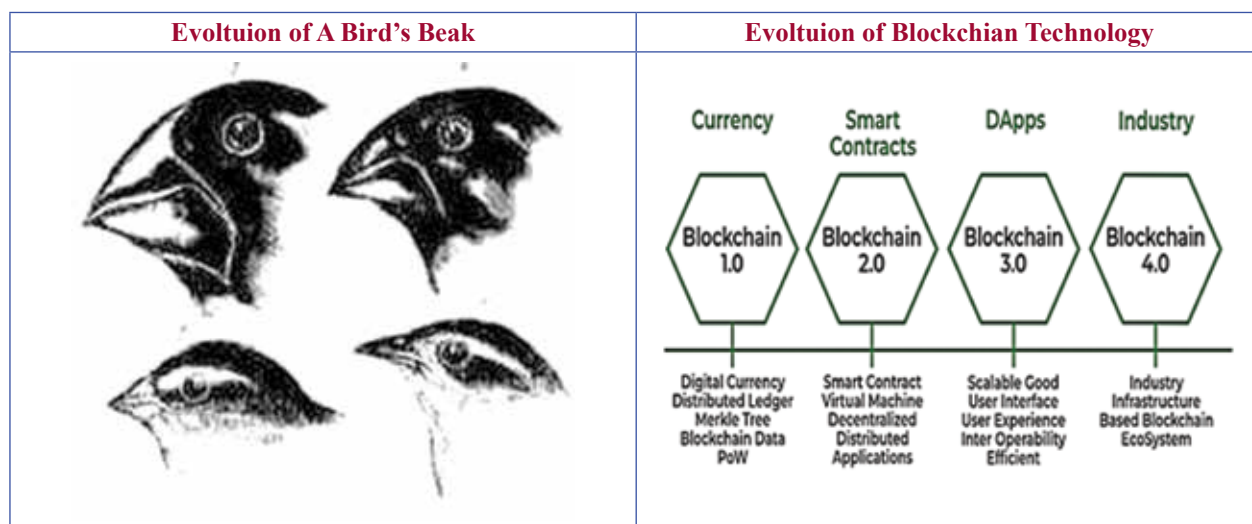
In the light of the above let the proposition be examined. It is globally being perceived that intensive collaboration

Digital Darwinism and Blockchain Technology

Let this be kept in mind that, *“The core of Darwin’s theory is natural selection, a process that occurs over successive generations and is defined as the differential reproduction of genotypes. Natural selection requires heritable variation in a given trait, and differential survival and reproduction associated with possession of that trait.”* The following graphics show how a bird’s beak has changed over generations to help survival vis-à-vis how blockchain has also evolved over the years.

by and between ICT technologists, digital scientists and business community are enhancing the process of development and applications. All these are being further accentuated by young stars through their innovations in search of new more. They are continuously questioning the prior ideas. Along with them other stakeholders like business entities are driving the transformation process for survival and growth. The target customers, i. e., common people are also accepting and adapting to the new way of living life. Extending the core theme of the above definition of Darwinism will it be right to conclude that new species of digital technologies are evolving due to the stakeholders being driven by the process of selection? Let the readers further reflect on the points.

If readers, who are also being influenced by such processes of digital transformation, keenly watch, and analyse the situation, the revelation that would be that all such stakeholders are working with the thought process of doing better driven by Darwin’s postulate of ‘*The nature, power and scope of selection*’. Business architects are challenging and disrupting their predecessors’ ways of conducting operations by innovatively applying the power of further advanced digital technologies. Digital scientists are also continuously using the ‘*The nature. power and scope of selection*’ and striving with ‘*Probability and chance*’ for digital technologies to evolve for success.



Source: Bird’s Beak

<https://www.globalchange.umich.edu/globalchange1/current/lectures/selection/selection.html#:~:text=The%20core%20of%20Darwin’s%20theory,with%20possession%20of%20that%20trait>

Source: Blockchain <https://www.geeksforgeeks.org/phases-of-evolution-of-blochain/>

The above picture reveals that the bird’s head and beak evolved over the years to become longer and sharper in angle. This has increased its ability to pick up small food items lying on a flat surface or hanging in a suspended condition. The fourth form of the beak, as shown in the picture, has also helped it to dig into items like soft fruits for eating the flesh and fibre.

In a similar manner blockchain technology has also evolved. Its first version was only useful for handling cryptocurrency transactions. Over the years insertion of smart contracts have made the technology useful for decentralised and distributed applications. Its third version has made it more adaptable to scalability and interoperability. Finally, the present fourth version has rendered it to be a useful platform for multivarious industrial applications. Governmental agencies are also appreciating the qualities and importance of blockchain and adopting for various purposes.

All these does indicate that evolution of technology has also followed the path of selection, preservation, mutation, transformation, and evolution further for adaptation. Darwin himself said that⁵ “*I have called this principle, by which each slight variation, if useful, is preserved, by the term Natural Selection.*” Vast applications of digital technologies with continuous metamorphosis have squarely changed BFSI sector by heralding the new era of FinTech. This again testifies Darwin’s statement of preservation. In the reverse way one can say that functioning of banking and financial sector has evolved for the better when supported by digital technologists. Blockchain is now being used as a platform for introducing central bank digital currencies (CBDC) by many sovereign nations.

Therefore, it is understandable that no theory can do without **teleology**, i. e., as per the words of narratives of oxford dictionary, “... *the explanation of the phenomenon in terms of the purpose they serve rather than the cause by which they arise.*” Seeing the power and benefits of blockchain technology, industry and governmental organisations are more and more adapting to blockchain for generating more values. Blockchain is gradually evolving from a high impacting to foundational technology. This is

what is enshrined in the third pillar of theme in Darwin’s Darwinism, viz. ‘*Adaptation and teleology*’.

Digital Darwinism and Artificial Intelligence

There is no need to write more about similar evolution in the domain of cognitive technologies, viz., Artificial Intelligence, Machine Learning and Deep Learning. These technologies are continuously evolving by becoming more and more versatile and adapting in nature. These serve the critical need of solution designers by solving complex problems and helping management professionals to take strategic decisions. AI has further extended its domain by combining with mechatronics. Mechatronics first gave birth to robotics technology by combining three domains of engineering, viz., mechanical, electrical, and electronic with control technology of ICT.

AI joined this club in creating artificially intelligent robots leading to a new domain called AI-Robotics. This new technology has again given birth to humanoids that can mimic certain tasks of human beings by attaining and applying elementary level of human intelligence. In the ICT software domain also, AI has helped in crafting artificially intelligent automated processes for transaction handling called RPA or robotic process automation.

Digital Darwinism and Web3

The first version of world wide web, i.e., Web1 brought in the era of ‘Information Economy’ in 1990s. It evolved at a faster speed and the world experienced Web2 from around 2005 which ushered in the era of ‘Platform Economy’. And now the world is experiencing Web3.0 which has become possible not only because of evolution of www but also collaboration with digital technologies like Blockchain. AI, AR, VR, etc. Such collaboration of technologies has also given birth to a new world of virtual experience called Metaverse. Readers can know more about this from the author’s article⁶ published under this column in March 2022. The following table by listing the features succinctly narrates transformation from Web1 to Web3:

	Web 1.0	Web 2.0	Web 3.0
INTERACTION	Read	Read-Write	Read-Write-Own
USER DATA	Cookies	3 rd Party Controlled	Portable and Personal
MEDIUM	Static Text	Interactive Content	Virtual Economies
ORGANIZATION	Companies	Platforms	Communities
INFRASTRUCTURE	Personals Computers	Cloud & Mobile	Blockchain Cloud
CONTROL	Centralized	Centralized	Decentralized
AD-SPENT	Page Views	Cost Per Click	User Engagement

Source: Adopted from Grayscale Metaverse Research Report

Readers will agree that the most important factor for success in digital transformation is user-centric solution designing. This is primarily because users and customers are also evolving to become more demanding, intelligent, adapting to change, and quick adopters of technologies. Such developments in turn are making them more imaginative to expect solutions several steps ahead of what digital scientists could think through and/or design. It has rather become a debate of who is leading what in technology domain. Is it the customers and users influencing the solution designers or the other way round? Here again Digital Darwinism comes into play through Darwin's fifth pillar of theme, 'The tempo and mode of evolutionary change'.

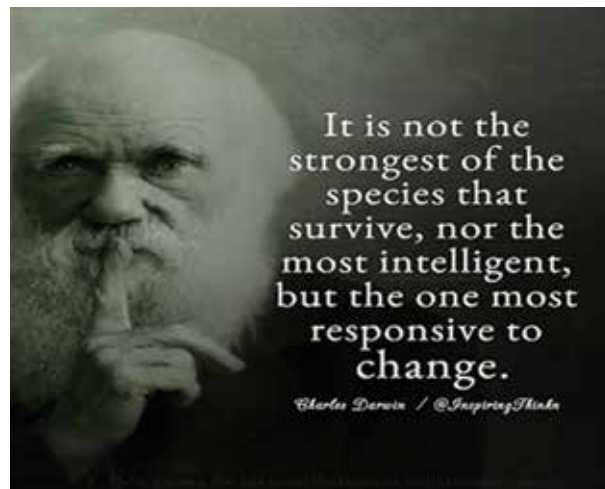
From the perspective of the fourth pillar of Darwin's theme of 'Nominalism vs essentialism about species', the author is of the view that digital transformation has an underlying essence of first serving people's inherent nature to innovate and perform tasks in a better manner after picking up lessons from what happened in the past. This characteristic of helping to do better has made them what they are today. That is why digital gossellers is of the view that digital transformation is a never-ending journey and not a destination. Prima facie common people think that all these are being done only for the purpose of doing business and earning profit by deriving competitive advantages from digital technologies. But none looks at the joy of self-actualisation digital scientists derive by making technologies to evolve and serve humanity by applications in solving their problems.

Digital Darwinism - The Guiding Light

At this juncture it may not be an exaggeration to write that knowingly or unknowingly both business architects and technology architects have been guided by the light of Darwin's Darwinism. These two groups have jointly gone through the process and helped continuous evolution through which path they have followed the five pillars of theme of Darwin's Darwinism. They have made all that for the digital world to evolve. They have made older technologies to move towards extinction by following the principle of creative destruction, innovated newer and better versions of previous technologies by following Darwin's theme, 'The nature, power and scope of selection'. Thereafter they have crafted improved solution with the newer version of technologies.

Therefore, by all probabilities the light of Darwin's Darwinism has guided them to make digital technologies to evolve and leave the earlier version behind. Brian Solis, an eminent author, and digital anthropologist has opined that, "Digital Darwinism shines a light on the future by exploring technology, society, and lessons from the past so you can understand how to adapt, what to embrace and what to ignore. ... If you want your organization to succeed in the post-digital age, you need to be enlightened by

Digital Darwinism". By any stretch of logic or imagination it may not be possible for any stakeholder, connected with the tasks of digital transformation, to ignore the following message of Darwin:



Source: <https://medium.com/quartictech/survival-of-the-fittest-b178b4336f5c>

Conclusion

The author is consciously aware of that this is a daring attempt on his part to write anything on the "...concepts, principles, and methodological maxims" related to Darwin's theory of evolution. More daring is the task of correlating the same with what have happened and are expected to happen in the field of digital transformation. But Darwin's theory has always amazed him to the extent that in the back of mind always there remained a desire to reflect on the emerging dynamics of digital transformation in the light of Darwin's Darwinism. This article is the outcome of that desire. The question will remain whether this attempt could meet expectations till some feedbacks are received from readers. The author would remain committed to think and reflect more on this amazing phenomenon of evolution. MA

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