

**ROLE OF HIGHER EDUCATION INSTITUTIONS IN SOCIETY:  
CHALLENGES, TENDENCIES AND PERSPECTIVES**

Academic papers

**Nr. 1 (8)**

# HISTORICAL AND INNOVATIVE CONCEPT OF SCIENTIFIC DEVELOPMENT

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## Summary

This article shows the historical lifetime of independent science in different periods of the evolving of science from the Prehistoric period of science to Contemporary period of science in the history and thus, the influence of the church on science and political ideology in different periods. It shows the difference between the scientific truth and propaganda. The article shows the way propaganda ideas become scientific truth in people's mind today. The last section of the article shows the Model of Innovations in the world and makes clear how ordinary people can be a part of the innovative process.

**Keywords:** History of Science, Scientific Truth, Propaganda, Science Lifetime, Innovative Enterprise, Innovative Model.

## Introduction

Science, is like a circle, spreads slowly but extremely powerfully. On the other hand, science is like a spiral and becomes bigger and bigger over the years and in the world. However, this spiral also has a dark shadow that tells a lie of society. Does it catch your interest? Thus, we will look into science from different perspectives.

Independent science is the main cause of the world progress, new technologies and industrial innovations. Today we see a lot of news about innovations such as Technology News, Live Science and Entrepreneurs along with other media. Those sources show us an array of news about innovations every day. "Harley-Davidson Unveils First Ever Electric Bike" (Entrepreneur Journal, 2019), "CIMON the European space robot cops an attitude" (NBC news, 2019) and "Latest tech share prices: Which tech shares should you buy?" (Tech Word, 2019), which are just a few of such news related to innovations. Then one question arises - "We have so many innovations in the world but do all of them contain science? Moreover, "How does science refers to innovations?" These are very delicate questions, which we try to answer in this article. That is why it is important to analyze the historical lifetime of independent science and scientific truth.

## History of Science

Previous studies indicate that we can find a big gap between information from the media and the history of science. Henning Schmidgen has proposed the most interesting approach to this issue. As Schmidgen argues: 'But perhaps what is at issue is not at all clarification but effect and impact. If that were indeed the case, then once again, it would be the analyst who would have the final word.' (Schmidgen, 2018:121). This means, that real life we will see is not the truth but just the words of winners. Therefore, for better understanding of "What is real science?" we should look into different periods.

## Prehistoric period of science

Firstly, let us look through the history of science in the prehistoric time and analyze of the main facts. Humanity has one main invention in the prehistoric period and that is the writing system, this innovation developed the communication system. Likewise, the wheel was invented in the prehistoric period, which made huge step of establishing the technological industry. Why invention and not innovation? Because innovation implies making something extremely new, that has never existed before. In this view, the writing system is just a new type of spreading information. In this case, we updated a kind of tool like the speech, but did not innovate a new tool. Today we can see this incredible invention from the prehistoric period in the pictograms of Sumer's and Egypt's pyramids and Steatite seals images in the Indian Civilization. However, we can assume that the writing system was invented to stretch out about science. In that type of spreading information, we do not find references or authors, but we can find one main point of science, which is cogitation and method.

## Ancient period of science (3000 B.C.–476)

The ancient time is a fundamental point of time for creating international independent science. Firstly, we want to check out that fact that in this period all fundamental types of science, such as politics, law, educational systems, philosophy, science, warfare, poetry, historiography, ethics, rhetoric, art and architecture of the modern world was established. Along with other main languages in that period was Latin, all of which

primarily consist of Ancient science was spread by philosophers in the Greek colonies, but also during the Iron Age Italy and the Roman Empire.

In 325 BC, an important event took place, demonstrating the interesting situation between Alexander III of Macedon (Alexander the Great) and the ancient philosopher *Diogenes the Cynic*. In that period, Alexander had all possible titles except one title; he was even claimed as a “one of the Gods”, but missing to be proved by the scientific society. One of the days, Alexander came to Diogenes to corrupt him. Most surprisingly was the answer of the philosopher: “Dear emperor stand a little to the side, you are blocking the sunshine”. This situation shows that kings cannot corrupt real science neither can the church, considering that real science should have freedom of speech and independent life. Science starts to take a powerful position in the world as well as the innovation process.

### **Middle Ages of science (476–1492)**

The majority of power in this period is taken by the church and religious ideology. We can easily say that it is the time for religion to become the ruling power of the world. Diderot et al., in their study of religion, made an encyclopedia over that period, and concluded that it was a time of deep decline of culture.

The increase in science manifested war between the kings (empire, state, country, etc.), the church and the philosophers (scientists in that period) and was caused by more power of persuasion by scientist and scientific ability to acumen the main policies or/and church goals. That is why, science as independent institution became extremely risky, because all kinds of propaganda was working against them. A lot of philosophers and scientists were expelled from countries or killed by that type of regime.

In 1195, *Averroes*, a Muslim Andalusian philosopher was deported from Spain to Morocco and all his books were burnt because of its contradictions by the part of church faith and religion.

In 1315, *Pietro d'Abáno*, an Italian doctor and philosopher was killed in prison because of the Catholic Church Inquisition. Today, we can say that he was a founder of the philosophical school of Padua, that traction the old works of Aristotle.

### **Early modern period of science (1492–1789)**

In this period, we can see the main culmination of the war between church and different kinds of philosophers that represented science. The Index *librorum prohibitorum* (List of Prohibited Books) was the worst as well as the cruelest policy aiming to stop spreading of the scientific truths in this period. A lot of books and scientific theories were burnt and lowered forever or secretly kept in the archives, mostly by the Catholic Church, if we are talking about Europe. The study of the independent science in this period showed how different institutions of power tried to stop it, when independent science speaks the truths that proves the opposite of their policies. The most magnificent facts of this are:

In 1553, *Michael Servetus*, a Spanish theologian, physician, cartographer, and Renaissance humanist was killed by Catholic Church Inquisition. He was a doctor who first correctly described pulmonary circulation in the human body.

In 1633, *Galileo*, an Italian philosopher was suspected by a Catholic Church trial in Rome. Before the trial, he had printed the book “Dialog” that proved the theory of Copernicus and dispelled the interpretation of the world seen from Catholic Church point of view. This fact was the main reason why the Catholic Church and Inquisition system tortured a scientist over two months. After two months, Galileo was forced to abandon his theory, after which he was imprisoned and then put under house arrest until the end of his life. He put “holy faith” in doubt and although he did not win during his lifetime, he was looking far ahead of his contemporaries. According to this situation, we have made conservancies that independent science is strong object that can discredit the church or political ideology.

### **Modern history of science (1789–1914)**

It is a time of big geographical discoveries and good time for spreading the scientific truth. Additionally, we can say that it is a time of formation of modern scientific methods. Traditionally, it has been argued that the development of printing was helping to spread the scientific truth and make a lot of scientific discoveries and inventions quickly in this period. It is a time of big political and technological progress and it becomes a time of Scientific Revolution when we can see the fundamental transformation of astrology, biology and physics (Hasen, 1910).

At the same time, it is a time of big Revolutions such as the Industrial Revolution, the French Revolution, the American Revolution, the Russian Revolution, and the First World War. These Revolutions make a big step in development of science and support new innovations and investigations in science, especially in medicine, biology and technology (such as weapon). In addition to this, in 1846, Nobel invented the dynamite. On 27 November 1895, he established The Nobel Prize, and it was a huge step to promote science, as we

know it today. Alfred Nobel said “For the greatest benefit to humankind”. Therefore, this phrase from such a person makes of us a more clear perspective why independent science is so important for people’s life and development.

### **Contemporary history of science (1914 – today)**

In the long run, all this period becomes our contemporary history of science with such scientists as William D. Nordhaus, and Paul M. Romer and the science they make today. A major problem with the science of this period is an extremely big amount of Big Data, BI systems and Social Statistics that explain us the main regularities in the world by the real facts, which are repeated many times, but not visible to the human eye. It’s a quantity that is much higher than in every other historical period. That is why, it is very important for scientists to distinguish quickly and to analyze what is real science, lasting for decades and what is just temporal propaganda.

### **Conclusion**

Summing up, we can see that the most important discoveries were made when people from the inertia of thinking and wisdom spirit only spread their knowledge and expertise. Thus, they do not make it possible to assume the obligation that their work, has a scientific truth, because contemporaries accepted them. Therefore, the question arises as to what is the scientific true, independent science and how adversity adversely affects the development of not only science but also the entire planet during the span of history.

### **What is Propaganda and what is Real Science**

To understand the meaning of propaganda today, we should see how it evolved through the history and how it is linked to education and science in particular. Therefore, the role of propaganda is to change the identity of real science in the mind of ordinary customers. What do you mean?

Propaganda is the oldest and the most powerful tool to put your own meaning on people’s mind, and influence on their designees. According to the *Oxford Dictionary*, the definition of “propaganda” is information, ideas, opinions, or images, often only giving one part of an argument that are broadcasted, published, or in some other way spread with the intention of influencing people’s opinions.

The first appearing of “propaganda” was traced to 1621-23, and appeared in Rome in “*Congregatio de propaganda fide*,” meaning “congregation for propagating the faith.” The aim of this *Congregation* was spreading of the Catholicism, and under its jurisdiction, the Cardinal Prefect of Propaganda was initiated. During that period, it was the main “aim was widened to include collecting material help for the missions, the promotion of missionary vocations, and educating Christians with a missionary spirit” (The Congregation for the Evangelization of People). This document shows us the connection between church and propaganda, and has proven the documentary of the first steps of legal propaganda in the world.

Edgar H. Henderson (1943), identifies that emphasizing the process-character of propaganda, the proposed definition opens up the way to genetic studies of typical propaganda processes, and to a possible genetic classification of propaganda-techniques (Edgar H. Henderson, 85). In addition, he lists two types of propaganda, which are Mass Propaganda and Individual Propaganda. By way of explanation, Henderson said that genuine education cultivates the critical thinking in the child that cannot do the normal education, which is why it pushed the child into the hands of the propagandist. Predominantly, it shows that the main aim of the propaganda is the victim, but on the other hand, it will give a good backbone for a person to become a free intelligent individual.

Philip M. Taylor (1980) examined the influence of propaganda in the social life, and he declared:

*In theory, the department of information was an independent, centralized propaganda bureau directly responsible to the prime minister but working in close contact with the Foreign Office.*

That is why propaganda in genuine education is a tool for government to control and have a great influence in sustained period. It is ideal, that government has an ultimate power to control independent science and hide the unwelcome scientific truth through the control of education budget and scholarships (Taylor, 888).

Christian Mull et al. (2013), analyzed the propaganda as a tool of strategic influence. He defined the propaganda in the focus of world security as the term propaganda received an increasingly negative association, policy makers sought to distance themselves from outright promotion of its use. Therefore, he measured Propaganda and Public Diplomacy as different categories that have nothing in common. He makes the conclusion, that Propaganda is based on selective truth. (Mull, 3)

In 2014, L’Etang et al. published a paper in which they described the connection between propaganda and Public relations (PR). The present study involved that PR historically is linked to the process of thinking

and writing about the history in their own ideological way. Hence, this spread of circulation of dishonest are connecting with the institutions, agencies and worldwide networking to produce propaganda (J. L'Etang, 2014, 652). In our meaning, PR is a new type of propaganda in the specific way of spreading. As long as propaganda is spreading by the network of churches and the education system, propaganda in Public relations is spreading by the mechanism of social media, TV, video, films etc. In other words, it is the same information but different physical types of persuasion of people.

## Conclusion

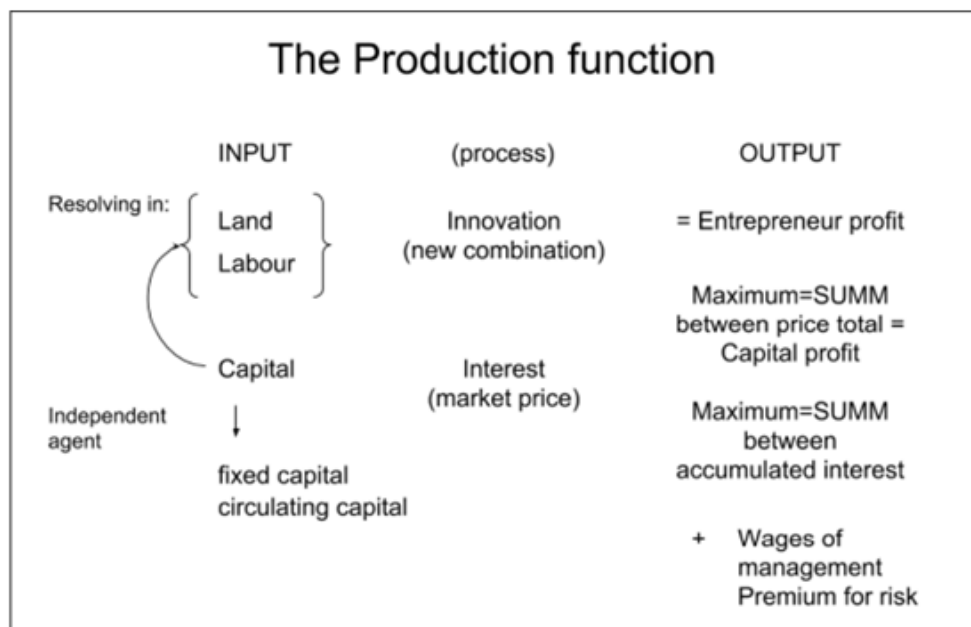
Finally, in this part we can see the historical and evolving time lapse of propaganda that takes their first step from the Roman Catholic Church and becomes the worldwide communication network of spreading ideological information and persuasion of people. On the other hand, the person that does not have critical thinking, as stated by Henderson, is easier to control.

## The Model of Innovation and their influence in Science

Innovation is the main power of business and world development. The new entrepreneur should make innovations in their enterprise three-five times a year to make their business make profit and become competitive in real time. Many people think that innovations just came from the business and corporations, but not all of us now that first these innovations came from philosophers or independent scientists, as we call them today. The definition of "innovation" in Cambridge Dictionary is a new idea or method, or the use of new ideas and methods. Thus, we should see the ideas and methods separately, because the idea is the mental thinking of making life easier or resolving some problems that can be in different aspects of human being. On the other hand, the method is a physical process of resolving the same problem. The difference between the independent scientist and the entrepreneur innovator is that both can create ideas, but the methods they choose to solve the problem can be different.

Danke marked that it can be a picture of institutional ecology of innovations (Danke, 1998, 98). Danke (1998) grouped the Schumpeter's thesis as the following:

- market placement is "unstable", because it is a complex of evolutionary processes; (Schumpeter, 1942, 82)
- the driving force of development is "entrepreneur"; (Schumpeter, 1942, 83-84)
- the process of new inventions can be achieved through the innovations in entire business sector; (Schumpeter, 1934, 66)
- some business process changed to bid innovation development (Schumpeter, 1939, 139)

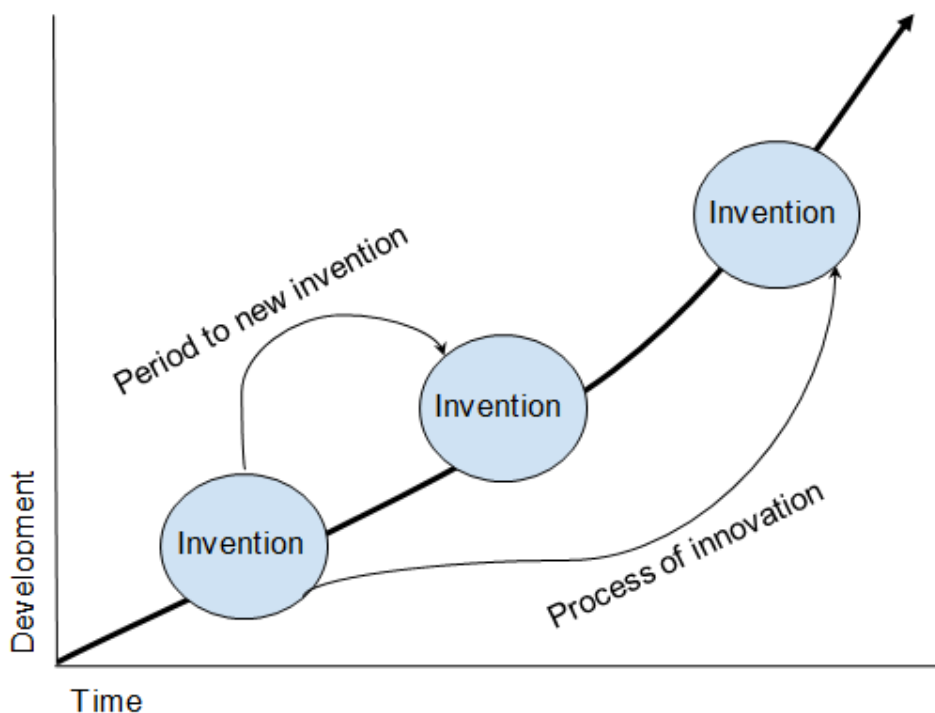


Picture 1. The Production function (Source: Fil. Dr. Jan-U. Sandal Institute)

Sandal (2017), states that a combination of factors in production function are the most powerful part of the strategic competitiveness of the company. To understand the logic, it is good to see the picture 1, production function of an enterprise. It shows how the mix of three factors that are land, labor and capital could create the profit of the enterprise. The right mix of different factors in the enterprise will be the case of

entrepreneur independence. Fundamental idea of the production function and the independent entrepreneur is that entrepreneur is not a part of production function. Hence he is just a manager or director of it. The main goal of the entrepreneur is to make innovations (the different mix of land, labor and capital) of better profit and involving social responsibility of the business. This shows, that business can be competitive just with innovations in it. (Sandal, 2017, 216). Innovation is new a combination of the first and second input factors, Land and Labor. There is no capital involved in innovation.

This result of the production function makes influence on the model of innovation that have primarily influence on the world development. In this model, we single out two main factors, invention and innovation. Invention is a result of small technological or methodological improvement of product or service that are placed right now in the market. On the other hand, innovation consists of all the inventions of one product from the day it appeared in a market to the day it will be pushed as an out of date. Time is the real measure when we analyze the profit of the product innovation. Thus, just after generations we can measure the social responsibility and social profit from this innovation to the society.



Picture 2. The Model of Innovations

Hence, with this model, businesses or enterprises that have small inventions in timeline can bring colossal development for the region, country and the world. In addition, it shows the macroeconomic model of influence of the innovations in the world, and that could bring huge welfare for the world like social enterprises.

### Conclusion

The process of innovation is deeply connected with enterprise and science at all. The scientist that made the idea and the entrepreneur that created this idea in reality are the main sources of world development. In according to the Innovations Model, innovation and inventions are the main force to the society development.

### General conclusion

Finally, we can see the scientific truth fail with different regimes. Hence, we have seen the independence of free speech. Thus, we understand how much time it should take when the scientific idea (truth) becomes a reality, e.g. about Galileo Galilei. Additionally, we see how we can implement the scientific truth in innovations between the enterprises.

### Future discussion

In the future discussion, we are planning to analyze the measure of science ranking and university rankings, different types of science systems and the influence these systems have on the scientific truth. Thus, we see a big gap in science measurements and analysis of scientific works.

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## Anotacija

### ISTORINĖ IR INOVATYVI MOKSLO PLĖTROS KONCEPCIJA

Šis straipsnis susideda iš trijų dalių. Pirmojoje dalyje kalbama apie mokslo istoriją, paaiškinamas laikotarpių skirtumas ir parodyta, kaip istorijos dalykai daro įtaką mokslams. Antrojoje dalyje paaiškinama pagrindinė propagandos samprata ir kaip ji gali pakeisti mokslinę tiesą. Be to, trečiojoje straipsnio dalyje kalbama apie inovacijų modelį, kuris paaiškina, kaip inovacijos daro įtaką vystymuisi ir kokia jų sąsaja su moksline tiesa.

Pirmojoje straipsnio dalyje galime perskaityti, kaip bažnyčios ir vyriausybės ideologijos bandė paveikti nepriklausomą mokslą ir kalbėjo netiesą apie mokslą. Kita vertus, mes galime sužinoti, kaip tokie filosofai, kaip Galilėjus, skelbė mokslinę tiesą žmonėms. Taigi svarbiausi atradimai buvo padaryti, kai žmonės tiesiog skleidė žinias ir patirtį, remdamiesi savo mąstymu ir išmintimi. Taigi negalima teigti, kad jų darbas yra mokslinė tiesa, nors amžininkai juos ir priėmė. Todėl kyla klausimas, kas yra mokslinė tiesa, nepriklausomas mokslas ir kaip nelaimės neigiamai veikia ne tik mokslo, bet ir visos planetos vystymąsi.

Antroje pastraipoje kalbama apie tai, kaip padaryti propagandą ir kodėl bažnyčiai ir vyriausybei taip svarbu paskelbti propagandą prieš mokslą. Taigi šioje dalyje apie istorinę ir besivystančią propagandą rašoma, jog Romos katalikų bažnyčia žengė pirmąjį žingsnį ir tapo pasauliniu komunikacijos tinklu, skleidžiančiu ideologinę informaciją ir įtikinančiu žmones. Kita vertus, žmogus, neturintis kritinio mąstymo, kaip sakė Hendersonas, lengviau pasiduoda valdymui. Kol propaganda plinta bažnyčių ir švietimo sistemos tinklu, viešuosiuose ryšiuose propaganda plinta per socialinę žiniasklaidą, TV, vaizdą, filmus ir kt. Kita vertus, tai yra ta pati informacija, tačiau žmonių įtikinimo būdai skirtingi.

Šiame straipsnyje pateikiama informacija, kad didelės inovacijos gali būti lyginamos su mažais išradimais, tačiau, jei pradžioje neturėsime inovacijų, ateityje neturėsime ir išradimų. Todėl labai svarbu turėti mažas įmones, kuriose galima kurti išradimus.

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