Future Trends in Space Education: Building up Capabilities and Foster the Creation of Competitive Space Education in Bulgaria

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ABSTRACT

This paper searches and explores the next steps for the space education and space industry in Bulgaria. The reason is simple - it is time to move away from the monopolies of a few huge companies and open up opportunities for new players. It is certainly plausible that newly created SMEs could create radically new solutions in the fields of space transportation, exploration, commercialization of resources and bring innovation to the sector. Through the exponential growth of technologies such as biotech, nanotech and material sciences, AI and robotics, neuroscience and medicine, the world is changing dramatically. It is time for the space sector to start moving forward with the same pace. This paper represents the author’s point of view of the space sector from a different perspective. The document does not give a concrete plan for the development of the national space program of Bulgaria when it comes to detailed steps and proposal of concrete niches. This will require a whole new research and could be the next step of this analysis. The article aims at presenting new logic for restarting the Bulgarian national space industry. It is not detailing the exact path but rather proposing logic for developing one.

Keywords: Bulgaria, Bulgarian Space Program, Small and Medium Enterprises, Space Education, Space Industry

SPACE AND THE WORLD ECONOMY

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The space sector is changing rapidly in the last few years. The emergence of new trends such as space tourism and the success of new private space companies in different fields of space science and technology have created the need for innovative educational programs. The paradigm has changed rapidly, pushed forward by the advancements in certain fields of science and technology, literally happening at exponential rate. All innovations based on this progress have created new types of industries, changed the company culture inside many leading organizations, and improved the lives of millions of people around the world. Just think about the impact that the smartphone had on global society – young people in many remote areas who never had access to the Internet, now can learn and stay informed through their phones. Even in Africa the number of PCs per capita is significantly lower than the number of smartphones per capita. Another example is the development of 3D printing technology which could redefine the manufacturing of products and industrial elements (“The printed world”, 2011).

The space sector has always been part of the global high-tech industry. It has enabled services so important for the modern society, such as navigation, Earth observation, telecommunication, that its strategic role is indisputable.

Due to the growing impact of the exponential technologies such as AI & Robotics, Nanotechnology, Biotechnology & Neuroscience, different sectors of the high-tech industry had to adapt to the rapid change and learn how to be constantly innovative in order to maintain market position. Companies that failed to foresee a given tech trend lost their share extremely fast. One important example is Nokia – from telecommunications leader, Nokia became secondary-level player, due to missing the trend of development of the smartphone industry (Huuhtanen, 2012). Most high-tech organizations accept the fact that the innovation is their only salvation in a business sense (Intel is a clear case in this sense).

On the other hand, Space has always been extremely difficult field for developing new business ideas and realizing those into practice. The harshness of the space environment has required the companies to make huge investments, associated with high probability of failure, uniquely customizable solutions and lack of mass production capability. This continues even today and makes most space organizations less flexible and much more traditional in their development. The “flight proven” terminology has for long time prevented the rapid implementation of new technologic solutions. Although part of the high-tech sector, the space companies have significantly slower reaction and adaptability when it comes to simple but decisive Change. This is another reason why in the last two decades the progress in space exploration and space business development did not meet even close the expectations of the investors and the global community (referenced to space companies and not space asset users).

WHAT HAPPENED?

A notion of secrecy surrounded the space sector in the early years of its development. Along with really ambitious goals it generated unprecedented social interest. Romantic belief of positive near-future change, based on our achievements in space was born. It inspired thousands of young people to pursue technical and engineering careers. It paved the way for new generation of scientists and explorers. The astronauts were the heroes of the day – our envoys in space. All those factors gave strong momentum to the space sector and it became a leading tech field of the global economy. Many spin-off technologies enabled the growth of the industry and improved the lives of millions.

Public interest in space science and technology started to decay – partly due to the lack of new “exiting” goals, partly because
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