

DIGITALNI PUT SVILE I KRIZA COVID-19

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Pregledni članak

Sažetak: Ovaj rad predstavlja ideju o Novom putu svile, najvećem infrastrukturnom projektu u svjetskoj historiji, s posebnim osvrtom na njegov segment nazvan Digitalni put svile. Ovaj će rad opisati tehnologije koje će činiti okosnicu Digitalnog puta svile, trenutne faze u implementaciji ovih tehnologija, kao i planove za budućnost. Posebna pažnja biće posvećena učešću zemalja bivše Jugoslavije u ovoj inicijativi. Pandemija COVID-19 promijenila je izgled za projekte pokrenute posljednjih godina. Ovaj rad daje pregled ključnih područja u kojima COVID-19 mijenja protok aktivnosti Digitalnog puta svile.

Ključne riječi: Inicijativa za pojas i put, Covid-19, Digitalni put svile, Novi put svile

THE DIGITAL SILK ROAD AND THE COVID-19 CRISIS

Abstract: This paper presents the idea of the New Silk Road, the largest infrastructure project in the world history, with particular reference to its segment called the Digital Silk Road. This paper will describe the technologies that will form the backbone of the Digital Silk Road, the current stages in the implementation of these technologies, as well as plans for the future. Special attention will be paid to the participation of the countries of the former Yugoslavia in this initiative. The COVID-19 pandemic has altered the prospects for the projects launched in recent years. This paper provides an overview of key areas in which COVID-19 alters the flow of Digital Silk Road activity.

Key words: Belt and Road Initiative, Covid-19, Digital Silk Road, New Silk Road

1. 1. Introduction

The Silk Road is a term that contains much more than the name for the land connection between the Far East and Europe (Frankopan 2015.). The term is originated in the 19th century (Chichagov 1983.) in an effort to describe a totality of relations between the East and the West of Eurasian continent, which implies the exchange of material and cultural goods, and scientific and technological discoveries but also philosophical and religious beliefs. Throughout the history of these relations, there has been a search for ways to exchange the immense wealth that different civilizations could offer each other in the safest and most efficient way possible. The value of goods transported over such long distances, by primitive means of transport, through extremely harsh geographical areas, had to be very high in order for trade to pay off. Due to that, the caravans that were transporting the goods were constantly endangered by the robbers, and the transport was completely unreliable. In addition, the entire space through which the exchange took place has always been politically unstable. In these areas, different empires took turns fighting each other for supremacy on the Eurasian continent, so it often happened that the roads were completely interrupted. This political instability has persisted to this day. In addition, the discoveries of sea routes from Europe to the Far East in the 15th century redirected most of the traffic to these routes, although they are much longer, more expensive and with fewer opportunities for the flow of goods. All this caused the land routes connecting Europe with the Far East to be used less and less, so that in the 19th and 20th centuries they would be almost completely interrupted.

The rapid expansion of trade between China and western countries, after China's

opening to the world in the late twentieth century, continued to take place mainly by the sea. 2013. the government of the People's Republic of China unveiled a strategic project called The Belt and Road Initiative BRI, popularly called the New Silk Road, which is considered to be the largest infrastructure project ever launched. It was originally intended that cover all the activities that need to be done to build infrastructure for transport connections between the Far East and Europe and Africa, using the latest technological advances. The initiative was originally divided into two segments. The first involves land infrastructure, highways and railways and the second involves the sea lines. China has invited all interested countries to take part in this project. Initially, the accession of states to the initiative was done by signing appropriate bilateral agreements, but given the huge interest of potential participants, participation in the project was raised to a multilateral level. So far, about 70 countries and 29 international organizations (Xinhuanet 2019.) have signed an agreement to join the BRI initiative.

The Digital Silk Road is the third segment to be added to the BRI initiative in 2015 (Lele&Roy 2019). It was first mentioned in 2015 in 'Visions and Actions on Jointly Building Silk Road Economic Belt and 21st Century Maritime Silk Road'. The aim of this initiative is to dramatically increase the opportunities for information exchange between areas connected by the new Silk Road. This includes the construction of transcontinental optical infrastructure by land and sea routes, more efficient satellite connectivity but also the integration of a number of new generation technologies such as: 5G, artificial intelligence, quantum computing, nanotechnology, clouding, big data, blockchain, IoT, smart cities, etc. .. (Shen 2018.).

Through the silk road in the 15th century, a plague pandemic arrived in Europe, which took about 100 million lives and significantly changed the course of European history. At the end of 2019, the Covid-19 pandemic started on the same path. The consequences that this pandemic has caused on a global scale will be shown in the time, but there is no doubt that their impact on global events will be dramatically worse than in previous world disasters in many aspects. However, as borders closed and lockdowns were imposed, progress stalled on a number of major BRI infrastructure developments. In June 2020, China's Ministry of Foreign Affairs announced that 30-40% of BRI projects had been affected by the virus, while a further 20% had been "seriously affected" (Oxford Business Group 2021.). China changes its focus more effort on the domestic economy in 2020. and 2021., rather than external programs like the BRI. Investing in large domestic projects and relying on its own resources has enabled the world's second largest economy to maintain stability even in a pandemic. Delays in the implementation of BRI initiative projects have been compensated, however, with the acceleration of the implementation of projects in its digital segment. The pandemic is providing new opportunities for China's rise as a global provider of digital infrastructure (Blanchette&Hillman 2020.). Digital connectivity has replaced physical contact wherever possible (Buckley 2020). The pandemic quite unexpectedly created a completely new BRI segment popularly called Health Silk Road. It push China to position itself as a global health leader. Medical supplies have been distributed around the world by Chinese government agencies, embassies and private institutions.

2. New Technologies and the Digital Silk Road

2.1. Fifth-generation mobile networks - 5G

Fifth-generation mobile networks enable significantly higher data transfer rates (up to 100 times higher than the rates that can be achieved in 4G networks) and reduce network delays to values that are negligible. Fifth generation networks should also solve the problem of limited network capacity and serve all users, even in situations when a large number of users are trying to establish a connection in a limited space. These improvements will make it possible to implement an extremely large number of new applications that are not possible at all or cannot be efficiently implemented on existing networks, such as: smart cities, driverless vehicles, advanced production automation, etc ...

In the strategic development plan *The Made in China 2025* adopted by the Chinese government in 2015, fifth generation mobile networks are listed as a key upcoming technology. The development and implementation of 5G networks is therefore one of the most important aspects of the Digital Silk Road. China plans to invest \$ 411 billion in building a 5G network on its territory. In addition, through various measures, China is encouraging the development of this technology in other countries that have joined the BRI initiative to ensure higher flows, data rates, system reliability and general availability, all in order to enable continuous data exchange between IoT (Internet of Things) devices and systems.

The change in traffic demand from city centers to residential areas, due to isolation measures and work from the home, have taken service providers unawares (Abubakar

et al. 2020.). Networks in residential areas were not optimized to handle a heavy traffic demand because most activities demanding huge network resources are mainly carried out at work places. This situation proved to be an additional motive to speed up the installation of 5G equipment and the realization of services wherever possible.

Conspiracy theories and misinformation connecting 5G with the spread of COVID-19 have led to the destruction of several BSs as well as attacks on telecoms engineers in different countries around the world. It is reported that about 77 BSs has so far been attacked in the UK alone (Ahmed et al. 2020.). Also, with the emphasis on working from home in order to reduce the spread of the infection and to ensure the safety of workers on site, fewer workers are being engaged for site operations, hence the detection and restoration to normal operations of cells in outage may be quite challenging this period. All these would result in network failure and service degradation if proactive measures are not put in place to mitigate the effect of these cell outages.

2.2. Artificial intelligence (AI)

Artificial intelligence can be most simply explained as a software simulation of a human intelligence. It is a system that is capable of reasoning, researching, discovering, learning and drawing its own conclusions. This makes it fundamentally different from traditional software that performs only the functions for which they are programmed.

In July 2017, the Chinese government adopted a development plan (State Council Document 2017.) which plans for China to become a global leader in standardization, technological development and the application of artificial intelligence by 2030. It is projected that the value of this,

completely new sector in the economy, in 2030 in China will reach a value of 21.6 billion USD (Eisenstark 2020.). The plan also envisions that China will establish at least 50 academic and research institutions that will deal with artificial intelligence by the end of 2020. At the end of 2020, China has 40,000 researchers who will deal with artificial intelligence. The Chinese government has funded major research projects in the field of artificial intelligence, companies such as Alibaba, Baidu, Cambricon Technologies, iFlytek and Tencent. By March 2019, Chinese researchers had applied for 66,508 patents in this field.

For a rapidly spreading pandemic COVID-19, AI can make medical treatments more efficient in several ways. It can assist to increase the speed and accuracy of identification of cases. Efficacy for virus detection can also be increased by employing the smart city data network using a terminal tracking system and data sharing for better urban management and the location of the next outbreak could be predicted. Using a mobile-based survey, COVID-19 can be identified and controlled in the population under quarantine. Susceptible people can also be identified based on personalized genetics and physiological characteristics (Azima et al. 2020.).

2.3. Blockchain technology

Blockchain is a distributed database that is replicated the required number of times (Minović 2017.). It is organized as a single-linked chain. Chain nodes are in fact blocks with transaction data. After grouping into a chain, this data is protected by various cryptographic techniques. The system enables the realization of digital transactions without intermediaries such as banks. It is based on the P2P architecture, where all nodes that participate in the implementation of the service have a copy of all records, and

constantly communicate with each other and synchronize records. In addition, the role of individual nodes is to constantly verify the authenticity of records in the chain, and to reject the proposed data blocks, if they do not pass verification.

Blockchain technology was originally used for the development of Bitcoin cryptocurrency as well as supporting systems, however, more and more opportunities are opening up for the application of this technology for other purposes as well. In interbank transactions, it should replace the SWIFT service, more efficiently and with significantly lower costs per transaction. In the state administration, registries and land registers can be listed so that once entered, the data becomes publicly available and verifiable. Organization of electronic voting, where each vote is transparently recorded and monitoring and counting of votes are publicly available. Application in healthcare, for storing patient data cards or in education, for storing diplomas and certificates. Application in trade, based on the concept of smart contracts. Hundreds of new services based on this technology are expected to be developed in the near future. Some of these services will make radical changes in the way we live and work.

Half of the world's patent applications in the field of blockchain technology have been filed by Chinese companies in the last few years. Some of the blockchain services are already in use. In 2016, the entire administration in the Chancheng District of Guangdong Province switched to blockchain services. In this way, local administration, business users, tax administration, public safety, social insurance, etc. are connected in a unique service framework available to every citizen and on the mobile application.

The pandemic has opened up entirely new possibilities for the application of

blockchain technology. It can play a vital role in tracking the spread of the coronavirus, identify high-risk patients. Blockchain is highly competent to control the infection in real-time defined as a digital database that contains information that can be simultaneously used and shared within an extensive decentralized and publicly accessible network (Azima et al. 2020). The COVID-19 medical findings, events and patients' health data can be stored as distributed ledger maintaining a single source of information that should be accessible to all nations. It is important for the research scholars to collaborate their findings to avoid duplication of works, waste of time and costs, and to guard against future pandemics. It will also enhance subsequent research on future pandemics. The use of blockchain can help prevent pandemics by enabling early detection of epidemics, fast-tracking drug trials, and impact management of outbreaks and treatment.

2.4. Quantum computing

In classical computer systems, data is stored, transmitted and expressed in the form of bits as the smallest information unit, which can have two states - the state of logical zero and the state of logical unit. In quantum computers, this role is played by quantum bit (Bolf 2019.). In doing so, quantum properties of particles are used to represent and structure data, and quantum mechanisms are used to perform operations on that data. In classical computers uncertainty is unacceptable and in quantum computers it is an advantage. They have the ability to learn by working with probabilities, while exploring multiple answers, to come up with complex decisions. In this way, with the application of appropriate algorithms, complex tasks are efficiently solved, the solution of which on classic computers would take days or would not be performed at all.

Through the documents: Made in China 2025 strategy, Civil-Military Fusion Plan (2017) and The 13th Five Year Plan (2016-2020), the Chinese government has set as one of the key strategic plans the development of computer and communication systems as well as sensor networks based on quantum computing. Large funds have been invested in the establishment and launch of the National Laboratory for Quantum Information Science as the largest institution in China dealing with the development of quantum computing. In 2017, the first quantum video call was made between Beijing and Vienna, via a Chinese quantum communication satellite, with guaranteed security (Sheng-Kai et al. 2018.).

The researchers noted that the existing drug-discovery pipeline can take five to ten years from initial idea to market approval, and could cost billions of dollars. The quantum machine learning approach could be faster and more economical than current methods used for drug discovery (Kent 2021). There are various methods of developing vaccines. However, what all these methods have in common is that they deal with complex computing during the design phase of the vaccine. During this phase, molecular simulations often have to be performed to understand the protein structure of the virus – either how it inserts itself into the cells or identifying binding sites. However, moving forward to phase 2 of the testing – testing if the vaccine works consistently – and phase 3 – testing the vaccine’s efficiency – new discoveries are often made sending the vaccine back to the drawing table. This begs the questions whether the ability to run more complex simulations, taking more actors into account, could reduce the chance of vaccines being ruled out in the second- or even third testing phase (Velzen 2021).

2.5.Space Silk Road

The term Space Silk Road was first introduced in 2014 by the International Alliance of Satellite Application Services (ASAS) (Assef 2018.), a company that promotes Chinese satellite services around the world. It is a strategic plan, as part of the BRI initiative, which includes satellite systems, launch services and ground infrastructure to support space programs globally. A key element of the Space Silk Road as an integral part of the digital segment of the BRI initiative is the BeiDou satellite navigation system. Navigation systems are certainly one of the key infrastructures for the development of the information society. Currently, the dominant global position in this area is held by the American GPS (Global Positioning System).

The BeiDou project, implemented by the China National Space Administration (CNSA) and CSNO (China Satellite Navigation Office), was completed during 2020. It fully implement the global satellite network for navigation with 35 satellites in orbit. It is estimated that currently in China alone, 6.17 million commercial vehicles (Geospatial World 2019), buses, taxis, express mail vehicles, ships and aircraft are used for navigation. In addition to navigation, the system is used to read through other services available to all BRI member states: satellite telecommunications, various geographic information, weather forecast, disaster monitoring, synchronization of communication systems, military and intelligence purposes, public safety, etc. Currently, 30 BRI signatory states use this system (Cheney 2019).

The Chinese space programme appears to have made progress in 2020. (Bommakanti 2021). The pandemic has had very little adverse effect, allowing the Chinese to insulate their space programme from the worst effects of COVID-19. 2021 promises

to be even more successful year for China in space. On February 10, China's independent Mars mission, the Tianwen 1, entered Martian orbit. Tianwen 1 will spend around two to three months surveying Mars for a suitable landing site. Another critical space mission for China in 2021 is the launch of its permanent space station. With decades of planning and launch experience with the temporary space labs, Tiangong 1 and 2, and human and cargo dockings, China has been incrementally planning for the 2021 Tiangong space station lift and construction. The successful launch of the Long March 5B rocket in mid-2020 has made it possible to meet deadlines of 2022 set for China's permanent space station (Goswami 2021.).

3. Participation of the EX-YU region countries in the BRI initiative

All countries of the former Yugoslavia are involved in the BRI initiative through a mechanism called Cooperation between China and Central and Eastern European Countries China-CEE 17 + 1 which is popular as the 17 + 1 initiative. This initiative is a regional part of the BRI initiative that connects the countries of Central and Eastern Europe with China.

Of the countries in the region, Serbia has gone the furthest in the implementation of the BRI initiative. The construction of the Belgrade-Budapest high-speed railway is the largest infrastructure project in the region, valued at \$ 3.8 billion. Chinese companies have taken over two huge industrial complexes, the Smederevo Ironworks (formerly owned by US Steel, which transferred ownership again to the Serbian government) and RTB Copper Mine and Smelter, the largest copper company in the Balkans, and the construction of a new 350 MW of electricity at the Kostolac thermal power plant, worth \$ 715 million.

Serbia has already taken part in some segments of the digital silk road (BIZlife 2019). The implementation of the project for the construction of the optical access network of Telekom Srbija, which is worth 150 million euros, is underway, and with the completion of which 750,000 households in Serbia should get optical access to broadband services. This project is being implemented in cooperation with Chinese Huawei. The same company is a strategic partner for the project of building a 5G network in Serbia, which began in 2020. In 2019, Huawei entered the realization of the project of the first smart city in Serbia - Nis (Eurasia Group 2018). This project includes the implementation of a large number of services in the management of systems important for the functioning of communal infrastructure, including control of public traffic, reduction of traffic violations, regulation of parking lots and garages, improvement of security, reading of central heating systems, control of water consumption and quality. It is planned to expand this project to Belgrade and Novi Sad. Alibaba, the largest Chinese and one of the world's largest IT companies, is involved in the project of building a Serbian-Chinese Industrial Park in Belgrade, the largest in Southern Europe.

The Peljesac Bridge is the first project in the European Union financed from the EU budget, whose contractor is a Chinese state company, China Road and Bridge Crop. Chinese interest in Croatia goes in three directions: seaports, infrastructure with an emphasis on railways and shipbuilding. The greatest interest is in ports, as points for the reception and distribution of Chinese goods to Europe. Certain investments have already been made in the modernization of the port of Zadar. Related to this is the intention of Chinese investors to invest in the modernization of the Knin-Zadar railway. Negotiations are underway on Chinese investments to rescue the Uljanik shipyard with the help of the Chinese shipyard CSIC.

In Montenegro, a three billion-euro highway between Montenegro and Albania is planned, with China Pacific Construction Group as the main contractor. The company China Road and Bridge Corporation, which is building the Peljesac Bridge, is also building the largest Montenegrin project, the Bar-Boljare highway.

Slovenia intends to sell the port of Koper as one of the entry points for Chinese goods as part of Chinese plans related to the implementation of the BRI initiative in the Balkans. The Chinese multinational company Hisense, after winning the race with four other Chinese companies, took over the management of Slovenian Gorenje. In northern Macedonia, Chinese companies are engaged in the construction of certain sections of highways.

The construction of the Stanari Thermal Power Plant near Dobož, worth about 550m euros and owned by London-based EFT, is the only major project in Bosnia and Herzegovina to be fully implemented that is linked to the BRI initiative. The thermal power plant was built by the Chinese company Dongfang Electric Corporation (DEC) for the most part from a loan from the China Development Bank. For the project of the highway Banja Luka - Prijedor in the length of about 40 kilometers, a concession agreement was signed with the company China Shandong International Economic & Technical Cooperation Group Ltd of Shandong Hi-Speed Group Co. The value of the project is about 297 million euros. The Banja Luka - Mliniste highway near Glamoc in Bosnia and Herzegovina, worth 1.4 billion euros. The construction was entrusted to the Chinese state company Sinohydro, while the financial part of the construction was in charge of the Chinese Exim Bank. This highway should connect with "Dalmatina" near Split, creating a direct connection between Banja Luka and the port of Ploče. Unit 7, as a replacement thermal power unit at the Tuzla Thermal Power Plant, will, when

built, lead to the closure of Units 3,4 and 5. This is the largest project in the BiH power industry that will be built with Chinese partners with loans from Chinese banks.

The only segment of the Digital Silk Road that is in the implementation phase in Bosnia and Herzegovina is the project of reconstruction of the access network implemented by Mtel, a.d. Banja Luka with Huawei as the contractor and equipment supplier. The project includes the construction of an access optical network wherever possible and in the remaining field the modernization of access nodes and shortening of the subscriber loop with the aim of providing 90% of users with Internet access at a flow of at least 30 Mb / s.

4. Conclusion

The medieval Silk Road served not only as a way of exchanging material goods between east and west, but also as a way of exchanging new technologies and scientific knowledge. In this way, Europe imported technologies from China for the production of paper and gunpowder, a printing press and a compass, without which the history that followed would be unthinkable. The modern New Silk Road, the largest infrastructure project ever launched, has similar aspirations. The Digital Silk Road will, using the possibilities of the latest technologies that are still in the development phase, digitally connect the entire space covered by the BRI initiative. This connection will open up still unfathomable possibilities in the integration of artificial intelligence, blockchain technology, quantum computers and big data systems connected by high-capacity optical cables, 5G technologies and satellite transmission systems. The Covid-19 crisis has shown the ability of societies to function with decreased physical connectivity that is the key benefit of BRI. However, as physical globalization recedes, digital globalization will continue to grow. In this way, the

pandemic proved to be an opportunity for the accelerated development of the Digital Silk Road.

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