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Data Science Tools in Service to Combat Post-Covid Outcomes in International Economics

The article deals with the study of current capacity of data analytic tools from global technological business ventures that can facilitate the approach to overcome the international economic growth decline caused by the global Covid-19 pandemic.

The Author analyses existing strategies in business intelligence to improve managerial, marketing, production efficiency and its rapid growth due to data collection and development of analytical frameworks together with labour force sophistication. Newly established area of data science appears to have the capacity and force to contribute to economic recovery of national and global economies due to targeted solutions and efficiency of allocation of investment and resources.

Keywords: data science, covid 19, international economics, world economics, economic development.

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In late 2019, a string of the Coronavirus that could affect humans was detected in Hubei's capital city, Wuhan in China. This led to the COVID-19 Pandemic that spread rapidly through China. Pandemic hit global economy severely bringing overall decline in international trade. The World Trade organization has predicted that world merchandise trade could plummet between 13 and 32 % this year, following the impact of COVID-19. It's predicted the adverse effects of coronavirus on globalization may carry on for years, much like the 2008 financial crisis. [1]

National economies of leading states slumped drastically and overall influence is comparable to the Global Recession of 2008.

General recommendations of international organizations mostly stress traditional actions: transparency, promotion of supply chains, stimulation of free trade and increase of medical supplies due to the pandemic threats. However, current level of digitalization significantly raised the level of data and intelligence globally, thus current anti-crisis measures have the capacity to be addressed with a pinpoint accuracy and efficiency.

The paper is based on the publications of international organizations, academic papers, and researches in the field of data science and big data as infrastructure basis for data analytics. The idea of data science and business intelligence was well covered by LaValle, S., Lesser, E. [3], Michael, K. and Miller, K. W. [4]. Development of big data as

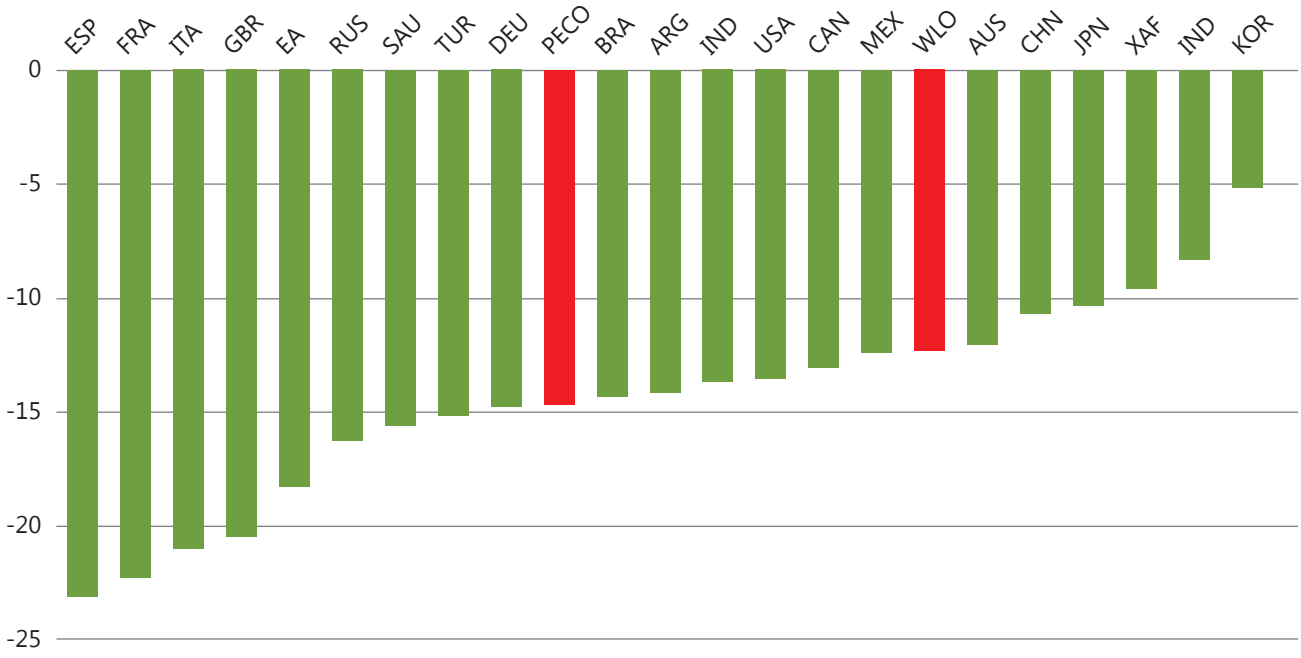

Fig. 1. Projected change in GDP at constant prices between 2019Q4 and 2020Q2 (per cent).

Source: OECD Economic outlook 107 database [2]

a new area of economic activity is explained by Waller M. and Fawcett M. E. [5] Tools of next generation data analysis to combat outcomes of Covid-19 were proposed by Abid Haleem, Mohd Javaid, Ibrahim Haleem Khan, Raju Vaishya [6]. Current state of global economy and the results of quarantine is monitored by oECD and WEF.

The goal of the paper is to analyze current possibilities and tools of business intelligence and its further development – data science, to combat outcomes of the global pandemic.

Traditional Business Intelligence was more descriptive and static in nature. However, with the addition of data science, it has transformed itself to become a more dynamic field. Data Science has rendered Business Intelligence to incorporate a wide range of business operations. With the massive increase in the volume of data, businesses need data scientists to analyze and derive meaningful insights from the data.

The meaningful insights will help the data science companies to analyze information at a large scale and gain necessary decision-making strategies.

"Business Analytics" and "Data Science" – these two terms are used interchangeably. But there's one indisputable fact – both industries are undergoing skyrocket growth. Specific difference in Data Science application are the programming skills of the performers and computational abilities of hardware as Data Science has rapidly risen as an activity with the growth of Big Data projects implementation.

Big Data is defined as high variety information assets that require cost-effective, innovative forms of information processing that enable enhanced insight, decision-making, and process automation. In essence, it is the process of collecting large volumes of data through computers, sensors, events, and people to use the gathered data to do things such as making decisions, confirm hypotheses, gain insights, and predict the future. Big Data involves the integration of all forms of information needed to sustain a company's operation, production, and performance towards achieving its ultimate objective by the end of the fiscal year [4].

Data is widely considered to be a basis of decision making and improved profitability. In many organisations, business analytics focuses on one core metric, and that is the organization's financial and operational analytics. On the other hand, 'Big Data' helps in storage, retrieval and analysis of large and complex data there by automating business analytics, by identifying trends from a wider variety of data coming in from all directions and letting the organization make better data driven decisions.

The global Big Data and Business Analytics Market size was valued at $171.39 Billion in 2018 and is projected to reach $512.04 Billion by 2026, growing at a CAGR of 14.80 percent between 2019 and 2026 [7].

The concept of Big Data Analytics plays a crucial role in entrepreneurial activities as it determines the authenticity of information collected and determines if it should be processed to

give out the desired result. Big Data is mostly applied in information processing systems to predict and classify specific issues affecting people's daily activities. For instance, in the financial system, banks tend to process new credit cards, loans, and mortgages for millions of people daily; hence, the collected data is processed, analyzed and stored for future reference. Therefore, in the decision-making process, banks and other money-lending institutions tend to use the client's stored data in the company's database to evaluate and determine if an individual is liable for a loan or not.

Essentially, the decision-making process is dependent on checking a customer's financial history and financial statement to determine if he has a consistent flow of income to pay off the loan within an agreed upon period. However, big data analytics has made it possible for bank officials to immediately assess a customer's financial credibility through the use of an algorithm-based data metrics that predict the possibility of an individual paying off the debt. Also, other companies have integrated the algorithm-based technology in the Healthcare industry whereby fitness organizations are developing wearable devices to measure biometrics such as heart rate, sleeping patterns, and calorie intake to ensure that the user is healthy and fit. Therefore, the ability to monitor these types of metrics is made possible through the access of big data supplied by medical companies that collaborate with technology companies that build fitness mobile application programs [8].

Research shows that the recommender system is crucial in every aspect of an organization because they are used for recommendation services in service companies like Amazon, Netflix, and Spotify, to mention a few. The recommendation system is designed to provide customers with the best options when it comes to buying books, movies, and music through online platforms. The operational function of the system is partially dependent on the general trends taking place in the commercial and consumer markets. For instance, if there is a rise in demand for household electronics, the recommender system is designed to ensure that online users can easily access webpages that sell the highly recommended household items. Digital behavior is monitored and scanned to help companies like Amazon determine what kind of recommendations to provide to their online users whenever they visit their webpages. Research shows that recommendations account for 38% more on click-throughs while Amazon claimed that 35% of sales originated from recommendations [9].

The business model of big techs rests on enabling direct interactions among a large number of users. An essential by-product of their business is the large stock of user data, which are used as an input to offer a range of services that exploit natural network effects, generating further user activity. Increased user activity then completes the circle, as it generates yet more data. The mutually reinforcing data-network-activity (DNA) feedback loop helps big tech firms to identify the characteristics of their clients and offer them financial services that best suit their needs. As a result, big techs can have a competitive advantage over banks and serve firms that otherwise would remain unbanked.

Big tech credit does not correlate with local business conditions and house prices when controlling for demand factors, but reacts strongly to changes in firm characteristics, such as transaction volumes and network scores used to calculate firm credit ratings. By contrast, both secured and unsecured bank credit react significantly to local house prices, which incorporate useful information on the environment in which clients operate and on their creditworthiness [10].

The telecommunication industry is one of the fastest growing industries because of the introduction of advanced technologies that have made it possible for companies in this industrial sector to grow not only in the domestic markets but across the international scene. The concept of globalization dictates that companies can create products and services that appeal to a larger consumer base which makes the organizational brand popular in the global markets. Hence, the big data analytics makes it possible for telecommunication agencies and corporations to assess demographic data such as age, gender, marital status, and language to create products and services that appeal to the larger group of the current customers.

Mobile Service Providers (MSPs) tend to integrate big data analysis to ensure that all needs and requirements of their existent clients are resolved and addressed. Due to the competitive nature in the telecommunication industry, most companies in the United States, Canada, and the United Kingdom have utilized big data to ensure that they offer their clients Value-Added-Services (VAS) and internet access that is supported by mobile technologies. Big Data allows telecommunication companies to analyze data collected from mobile subscribers to improve vital mobile services such as boost cell-tower frequencies and support billions of mobile devices in a single frequency. In other words, globalization has made it possible for MSPs in developed countries to provide mobile health services for subscribers located in under-developed countries to give them access to medical resources such as healthcare, Do-It-Yourself medication treatment, and basic prevention and curative techniques.

Big Data has allowed telecommunication firms to integrate advanced technology to introduce the Call Detail Record (CDR) technique which detects and monitors call patterns so that the MSPs can devise the necessary services and call packages that will entice clients to remain loyal to a particular mobile firm. For example, AT&T tends to offer fast internet services to all their mobile subscribers and offers amazing internet packages that will appeal mostly to the young people who love spending 85% of their time on their smartphones chatting, sharing photos and videos on social media platforms. Hence, the possibility of

AT&T subscribers to shift to Verizon Communications is highly unlikely because their MSP already meets their needs. The integration of Big Data in the telecommunication industry has made it possible for MSP companies to detect fraudulent activities taking place within communication systems. The application of big data has paved the way for the real-time data analysis whereby data networks are monitored for suspicious activities such as Denial of Service (DoS) and Distributed Denial of Service (DDoS) attacks.

Digital technology has paved the way for the development of communication and surveillance systems which assist in information flow and monitoring movement within specific vicinities. Thus, retail organizations have installed CCTV equipment in their establishments not only for security purposes but also to track customer movement by assessing the flow of clients during the weekdays and weekends to determine the peak hours when there is huge traffic of customers. Also, detecting the flow of customers allows retailing firms to assess their customers based on gender, age group, and purchasing patterns. Once data is collected it is used by retailing firms to categorize their products through a data mining process known as Market Basket Analysis whereby a client who is accustomed to buying bread and milk, gets the chance to buy jam as well. It is a calculated technique that forces customers to buy products that might complement what they are used to buying which serves to boost the retailer's financial growth in the commercial space. The fusion of globalization and the technological aspects of big data analytics have made it possible for most retail corporations to succeed in the international scene. Therefore, the Market Basket Analysis has allowed retail firms to gather stream data and monitor online behavior among their customers while checking their company's official website and offer recommendations about the best products and services in real-time.

The healthcare industry is considered one of the most lucrative industries in the world because people tend to fall sick all the time and they need medical attention to restore their health. Research shows that through globalization, successful American and German healthcare corporations decided to open subsidiary hospitals in under-developed countries in Africa, South America, and South-East Asia to fulfill the UN agenda by supporting the ideologies and efforts of the World Health organization (WHo). Due to the integration of digital technology in medical organizations, all patient records were digitized for safe-keeping for future reference and to minimize data distorting which was a persistent challenge for traditional storage systems in most hospitals in the United States [11]. Big Data within the medical industry is accessed through electronic patient records, clinical decision support systems, medical imaging, and machine-generated sensor data which store sensitive information about a patient's health status such as diagnosis, treatment plan, and medication routines. Therefore, big data analytics creates an opportunity for healthcare companies to develop a robust treatment system which enhances the quality of medical care as well as minimize the cost of treatment for needy patients.

Big data analysis in the healthcare industry advocates for the idea of centralization of information so that an international medical company like CVS Health can store all its patient records in a single location. In case one of their registered patients falls ill in South Africa, doctors stationed in the country can easily retrieve his medical data and treat accordingly. Besides, it eases the treatment process because patients already have access to a patient's entire medical record; hence, it becomes extremely easy to diagnose and prescribe the best medication for the ailing individual while checking if he or she is allergic to specific drugs. Online platforms such as social media networks have made it possible for medical firms to analyze large volumes of data collected from the various social media platforms to detect and monitor the spread of infectious diseases. For example, during the Ebola outbreak in West Africa, the Sierra Leone government in conjunction with the Center for Disease Control (CDC) conducted online surveillance programs especially on social media accounts to monitor the movement of infected people within the country and the entire region.

Apparently, big data technology can store a massive amount of information about the people infected with this COVID-19 virus. It helps in understanding the nature of this virus in detail. The data obtained can further be trained over again for developing future preventive methods. This technology is used to store the data of all types of cases (infected, recovered and expired) affected by COVID-19. This information can be effectively used for case identification and helping to allocate the resources for better protection of public health.

There is an immediate requirement to store such a large amount of data of these cases, using different data storage technologies. These data are used to undertake research and development about the virus, pandemic and measures to fight this virus and its after-effects. Big data is an innovative technology which can digitally store a large amount of data of these patients. It helps to computationally analyse to reveal patterns, trends, associations and differences. It can also help in revealing the insights into the spread and control of this virus. With detailed data capturing capability, big data can be used gainfully to minimise the risk of spreading this virus.

The research shows that business intelligence is central in the survival and growth of tourism and hospitality entities in the 21st Century. A business needs to undertake environmental scanning, industry scanning and internal analysis in order to position itself and deploy its resources for optimal results. This need is intensified significantly in today's era of the COVID-19 pandemic where all assumptions and projections have changed. A tourism entity needs to gather business intelligence and understand the impact of

the changes of COVID-19 on the macroenvironmental factors as well as the tourism sector of London and then match it with their internal competencies. This will culminate in agenda setting and strategy formulation in ways that would lead to the optimal deployment of resources and positioning of the firm on the markets.

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Буряк Г. С.

Інструментарій науки про дані в подоланні наслідків пандемії в міжнародній економіці

У статті досліджується сучасний стан аналітичних інструментів глобальних технологічних бізнес-підприємств, які спроможні поліпшити підходи до послаблення економічного спаду через глобальну пандемію від Covid-19.

Автор аналізує сучасні стратегії бізнес-аналітики, спрямовані на поліпшення управлінської, маркетингової та виробничої ефективності, а також їхній швидкий розвиток завдяки пришвидшенню збору даних, розвитку аналітичних систем і ускладненню трудової сили. Сучасно створена галузь науки про дані наразі має потенціал і силу позитивно вплинути на економічне відновлення національних та глобальної економік завдяки цільовим рішенням та ефективності залучених інвестицій та ресурсів.

Ключові слова: наука даних, covid 19, міжнародна економіка, світова економіка, економічний розвиток.