
Conceptual paper

A Conceptual Argument on the Digital Resilience Capability within the Developing and Developed Countries

Lakshmi Chaitanya Datti * and Mudiarsan Kuppusamy

Faculty of Business & Technology, University of Cyberjaya, Malaysia

*Corresponding e-mail: lakshmidatti@cyberjaya.edu.my

Article Info

Available online:

Received: 26.08.2022

Accepted: 25.10.2022

Published: 22.12.2022

1. Introduction

Businesses have been dynamically and quickly changing for centuries, largely due to technological improvements. Around the world, intelligent, digital, and integrated representations of technology are proliferating (Panetta, 2018). The Internet of Things (IoT), Virtual human-machine interfaces, and artificial intelligence are examples of cutting-edge business technologies that have substantial growth potential (Brynjolfsson, Hui, and Liu, 2019; Briggs and Buchholz, 2019). However, if a firm is not digitally structured and transformed for this purpose, it will be difficult for technology-driven growth to have the most impact on enterprises. To increase productivity and efficiency, digital transformation requires integrating information, infrastructure, processes, and people with digital aspects and procedures. An excellent example of digital transformation may be seen in the situations of LEGO and Starbucks. After reorganizing and going digital, LEGO climbed the value chain due to this new revenue stream from movies, mobile games, and mobile applications. Starbucks put a premium on customers' loyalty to create a digitalized customer experience. By offering a simple and convenient purchasing experience, the mobile order and pay app became their main digital transformation objective (Anthony et al, 2020). In essence, digital transformation enabled new economic value exchange and competitive advantage for organizations like Starbucks and LEGO (Walsh, 2017). These and many other digital transformation stories transpire macro or national-level spillovers, with the government of the day being the driving force.

While firms are jumping onto the digital transformation bandwagon, governmental-level initiatives and policies facilitate this purpose. Nevertheless, the continuity of digital transformation in the constant change environment is of concern as the transformation process is not a one-off event but rather a recurring phenomenon. In most cases, digital transformation happens based on the pull factors, i.e., the requirements of an organization. However, certain 'push' factors can also drive digital transformation, such as a crisis. Different types and levels of digital transformation occur regardless of whether it is a pull or push environment. Thus, the importance of digital resilience comes into play. Digital resilience is a phenomenon in which an organization can absorb the external and internal shocks that affect its existing and future digital transformations (Kuppusamy and Muzanarwo, 2021). Historically, scholars have defined resilience in the context of

a human's ability to withstand adversities and stress. However, Digital Resilience is about including digital engagement in the country to withstand the crisis. Countries acknowledge that digital transformation requires digital resilience to quickly respond to economic disruptions using capabilities to take advantage of changing conditions. The proliferation of technology has immense potential and digital resilience for the economy. However, digital resilience requires both culture and process-related changes. A country must constantly embrace external and internal shocks and crises, mainly in a digital environment. The ability to withstand crisis development and growth is resilience (Folke, 2016). To build digital resilience in countries, governments should invest in capabilities and engage in digital engagement like "digital literacy/skills, uptake, access to digital resources, technology as a barrier, broadband/existing infrastructure, attitudes to technology."

While individuals often use identical words like "skill," "competence," and "capability." Capabilities such as talent, attitude, and behavior help obtain a competitive advantage against competitors and help to increase the value of a country (Zhou et al., 2019). To assess the country's capabilities in using, adopting, and adapting these technologies fairly and equitably. A 'readiness index' has been produced by the technology and innovation report 2021 that indicates components: ICT deployment, skills, R&D activity, industry activity, and financial availability. Countries need to achieve digital resilience to increase the ability to face future challenges.

2. Disruption Context

The world was forced into isolation under COVID-19 in 2020. The pandemic is used as a massive test case to see how effective these digital transformations are in a country. Digital transformation provides the country with new tools and opportunities to deal with current crises and long-term development hurdles (Kuppusamy and Muzanarwo, 2021). As a result, digital transformation has become unavoidable, implying that it is associated with inevitable disruptions from three sources: socioeconomic-policy driven, information and communication technologies (ICT)-driven, and crisis-driven disruptions.

2.1 Socioeconomic Policy

The activities that governments conduct in the economic sphere are referred to as socioeconomic policy. it covers the procedures for determining interest rates and creating public budgets, as well as the labor market, national ownership, and other government actions (Prokopowicz, 2018; Strohmaier et al., 2019; Arsakaev et al., 2021). Economies and civilizations are currently undergoing and will continue to undergo, digital revolutions. The ongoing digitalization of the economy and society has the potential to increase innovation, lower prices, and provide better services overall. A successful shift to a digital economy is also required to promote inclusive and long-term growth while enhancing everybody's wellbeing (Afonasova et al., 2019; SASE, 2019). Digitalization, on the other hand, can be disruptive. It alters how people connect with society and the economy's structure and business strategies. As a result, digitalization creates significant policy issues such as privacy, consumer policy, security, competition, innovation, skills, and jobs. Failure to appropriately address these challenges could result in economic inefficiencies, reactionary policies, a deepening of inequities, and slower progress. The problem for policymakers is to figure out what policy combination will best enable national economies to reap the benefits of an increasingly digitalized global economy while also effectively addressing the challenges that come with it (Okhrimenko et al., 2019; Tselios et al., 2020).

2.2 ICT Driven

Information and communication technologies (ICT) play an essential part in almost every area of today's society. ICT has altered how we connect, find information, work, do business, deal with government authorities, and manage our personal lives. Because ICT impacts people's daily lives, it also impacts macroeconomic growth, impacting society by allowing infrastructure and living standards to develop (Delponte, 2015). "Digital telephone network, internet capability, mobile phones, internet servers, fixed broadband, and other technologies" are examples of information and communication technology infrastructure. The rapid expansion of ICT is critical for economic growth. It allows many economic and social life actors to easily access information and knowledge (Roztock et al., 2019). ICT allows people to communicate more quickly and effectively by lowering production costs and increasing efficiency. ICT facilitates access to new markets, lowers capital costs due to improved financial market efficiency, eliminates regional disparities in income and productivity, and facilitates access to human resources via tele-networking (Pratt and Lai, 2019). ICT has the potential to influence economic growth in several ways, including the production of goods and services in the ICT sector directly contributes to the creation of value-added goods and services in the economy, and increasing productivity in the ICT sector contributes to increased overall productivity (Toader et al., 2018; Kurniawati, Wigati, and Hasri, 2021). When ICT is not implemented vigorously in a country, infrastructure and infostructure would be ineffective and will not be future-ready when disruption happens.

2.3 Crisis Driven

The next disruption was crisis-driven, not only COVID-19 in 2020 but also the financial Crisis in 2008, which led to the country's disruption. The global pandemic and public health pandemic known as COVID-19 have a significant influence on the financial and economic markets around the world. There has been major income reduction, an increase in unemployment, and disruptions in transportation, service, and industrial sectors as a result of the disease mitigation measures that have been implemented in many countries (PwC, 2021). The risks of the rapid spread of COVID-19 appear to have been underestimated by the majority of governments globally, who have largely responded to the situation in a reactionary manner. Serious global action is required to save lives and protect economic interests as epidemics are unlikely to end very soon. The tourism industry, decreased productivity, business closures, fatalities, trade disruptions, and other factors have had a substantial impact on the global economy (OECD, 2020). COVID-19 may serve as a "wake-up" call for world leaders to increase cooperation on epidemic preparedness and provide the necessary funding for international coordinated action (Pak et al., 2020). To lessen the likelihood of major epidemics, the world has not made the required investments in preparedness and prevention measures.

As determined, three contexts of the disruptions are the socio-economic policy drive, ICT driven, and crisis-driven. This model has been designed for countries to engage in the capabilities and be resilient, either developed or developing countries. Below are two models for developed and developing countries that will determine how to achieve digital transformation in disruptions.

3. Digital Resilience Capabilities

A country's digital resilience determines a country's capacity to absorb the shocks/crisis that will affect its existing and future transformations. The ability of a country's industry to innovate determines its

competitiveness. Capabilities give businesses an advantage over the world's most significant competitors. In an era of increasing international competitiveness, nations have gained importance. As competition has shifted more and more toward the creation and assimilation of knowledge, the nation's role has increased (Porter, 1985). To build and maintain a competitive advantage, a highly localized method is used. Competitive success is influenced by national values, culture, economic structures, and institutions (Porter, 1990). The patterns of competitiveness in each nation vary greatly. In all or even the majority of industries, no nation can or will be competitive. Nations succeed in particular industries because their living environment is the most progressive, dynamic, and difficult (Porter and Karmer, 2002; Porter, 2011). Companies get a competitive advantage through acts of innovation. They approach innovation in its broadest meaning, incorporating both new technologies and new methods of doing things. They identify a new basis for competing or discover better ways to compete in existing ways. Innovation can prefer the form of a new product design, a new manufacturing technique, a new marketing strategy, or a new training method (Hanna et al., 2017). Companies must envision the future environment and new technological advances to remain competitive. A crucial component of future-ready company culture is continuous experimentation and enabling mistakes to happen quickly and then learning from them "failing forward" (Birs, 2021). However, digital technology must be used to improve efficiency and, as a result, the range and quality of services supplied to residents and enterprises. A country's capabilities to be digitally resilient in the future are knowledge, technology, and future readiness.

1. Knowledge
2. Technology
3. Future-Readiness

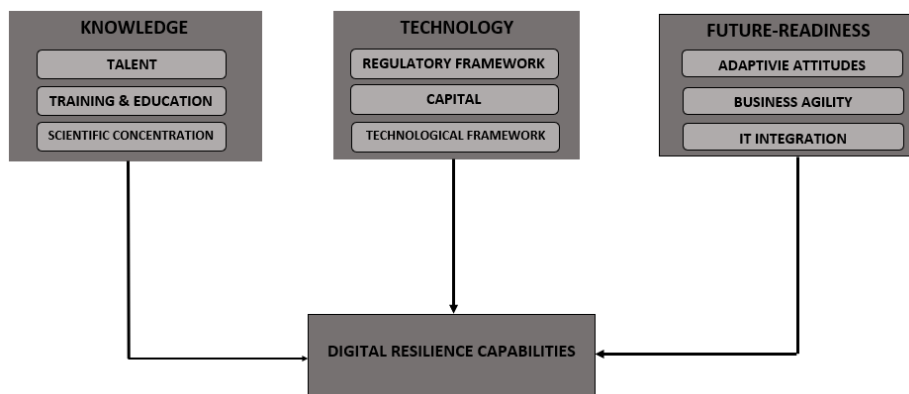


Figure 1 Digital Resilience capabilities

3.1 Knowledge

The knowledge factor refers to the infrastructure that underpins the digital transformation process of discovering, understanding, and learning new technologies in developing and developed countries (Mgonja, 2017; Ning and Wang, 2018; Barkhordari et al., 2019). The factors encompass three sub-factors: talent, investment in training and education, and scientific concentration. In a given country, talent refers to the pool of skills and abilities available. The talent pool's strength (Savage et al., 2017; Ding et al., 2020) and level of development are linked to the importance of worker training and education (Psacharopoulos and Patrinos, 2018; Mayeko, 2019; Zafar et al., 2020). The scientific concentration emphasizes the importance of

knowledge investment and production for an economy's digital transformation (Rokichi and Stepniak, 2018; Ismatov et al., 2019; Giroud and Ivarsson, 2020). Knowledge creation and use is the base for absorbing technological transformation, which leads to being digitally resilient when disruption occurs in developing and developed countries.

3.2 Technology

The technology factor evaluates the total context in which digital technology development is enabled (Salim et al., 2017; Franke et al., 2019). First, there is a supporting regulatory framework that enables the efficient performance of company activities and the enforcement of necessary regulations while fostering business development and innovation. Capital is the second component of the technology factor, and it assesses the availability and present investment in technology development (Boutilier, 2017; Miteva, 2019). It also takes into account the level of investment risk in a given economy. The current technological framework is the final component. The latter evaluates a country's current physical technology infrastructure as well as its quality. In addition, the framework takes into account high-tech manufacturing. Technological investments are essential in a country as the role of the regulatory framework usually encourages the facilitation of the development of innovation across countries. Innovation strategies and processes, product development, and new market identification are necessary to be digitally resilient. Moreover, these factors lead countries to be digitally resilient.

3.3 Future Readiness

The Future-Readiness factor examines the level of preparedness of an economy to assume its digital resilience. In this sense, it incorporates three sub-factors: adaptive attitudes, business agility, and IT Integration. To be competitive, available digital technologies must be "absorbed" by society. The adoption of digital technology necessitates specific adaptive attitudes, such as a society's readiness to participate in digital-related procedures, such as making online purchases. Business flexibility in terms of embracing new technology is also required for readiness. In this sense, business agility refers to the ability of businesses in a given economy to change their business models to capitalize on new opportunities. It also refers to the amount of innovation generated by the private sector. Finally, readiness necessitates IT Integration, which assesses how successfully all players apply IT-related behaviors and processes.

4. Advanced and Developed countries

In a macro-level digital transformation disruption context, the advanced/developed economies invest high in resilience capabilities and then face disruptions in any three contexts to achieve sustained digital transformation. If the resilience capabilities are invested in socio-economic-policy driven where the possibility of the occurrence is constant, ICT-driven possibility of the occurrence is dynamic and high, and Crisis driven possibility is unpredicted, then advanced/developed economies can achieve high sustainable digital transformation. As these economies have proactive investments and action plans, there are always fast, adaptive to new technologies or changes, and agile.

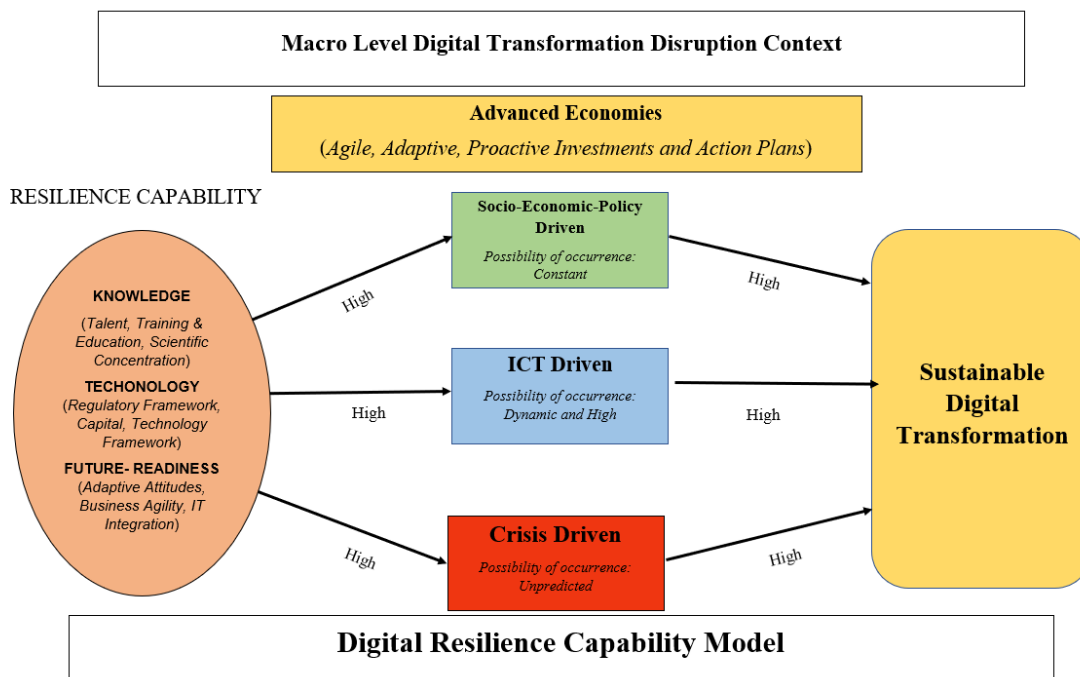


Figure 2 Digital resilience capability model for developed countries

Source: Author's Own

5. Developing and Emerging Countries

In a macro-level digital transformation disruption context, the emerging/developing economies invest moderately in resilience capabilities and face three disruptions to achieve Ad Hoc and Moderate digital transformation. The resilience capabilities are invested in socio-economic policy when the occurrence is constant, ICT-driven where the occurrence is dynamic and high, and crisis-driven where the occurrence is unpredictable, then the emerging/developing economies achieve Ad Hoc and Moderate digital transformation. These economies are a bit lagging, reactive, and bureaucratic investments, and action plans.

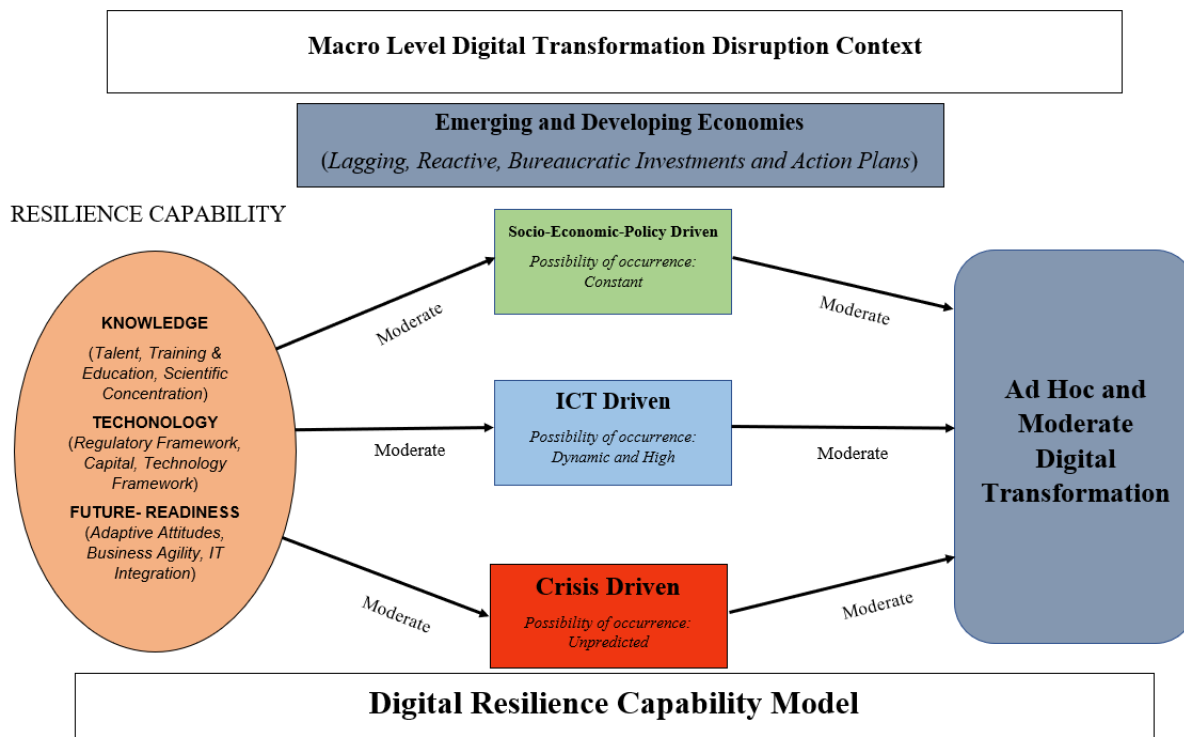


Figure 3 Digital resilience capability model for developing countries

Source: Author's Own

6. Conclusion

In today's dynamic environment countries investing in digital resilience capabilities are crucial to sustaining digital transformation. Disruptions driven either by socioeconomic policies, ICT, or crisis encouraged the development of resilience capabilities across economies. The high the investment in resilience capabilities the higher economies can achieve digital transformation in the disruption context, whereas the moderate investment of resilience capabilities Ad Hoc and moderate results of the digital transformation can be achieved. The digital resilience capability model showcases the significance of resilience capabilities in developing and developed economies during disruption.

References

- Afonasova, M.A., Panfilova, E.E., Galichkina, M.A. and Ślusarczyk, B., 2019. Digitalization in economy and innovation: The effect on social and economic processes. *Polish Journal of Management Studies*, 19.
- Anthony, B., Petersen, S.A. and Helfert, M., 2020, November. Digital transformation of virtual enterprises for providing collaborative services in smart cities. In *Working Conference on Virtual Enterprises* (pp. 249-260). Springer, Cham.
- Arsakayev, I.S. and Rabueva, M.S., 2021, September. Assessment of the economic efficiency of the transport system development: Economic and legal aspect. In *AIP Conference Proceedings* (Vol. 2389, No. 1, p. 100031). AIP Publishing LLC.

- Barkhordari, S., Fattahi, M. and Azimi, N.A., 2019. The impact of knowledge-based economy on growth performance: Evidence from MENA countries. *Journal of the Knowledge Economy*, 10(3), pp.1168-1182.
- Boutillier, J.J., Brooks, S.C., Janmohamed, A., Byers, A., Buick, J.E., Zhan, C., Schoellig, A.P., Cheskes, S., Morrison, L.J. and Chan, T.C., 2017. Optimizing a drone network to deliver automated external defibrillators. *Circulation*, 135(25), pp.2454-2465.
- Briggs, B. and Buchholz, S., 2019. 'Deloitte Insights, Tech Trends.
- Brynjolfsson, E., Hui, X. and Liu, M., 2019. Does machine translation affect international trade? Evidence from a large digital platform. *Management Science*, 65(12), pp.5449-5460.
- Delponte, L., Grigolini, M., Moroni, A., Vignetti, S., Claps, M. and Giguashvili, N., 2015. ICT in the developing world. *Scientific Foresight Unit. doi*, 10, p.52304.
- Folke, C., 2016. Resilience (republished). *Ecology and Society*, 21(4).
- Franke, T., Attig, C. and Wessel, D., 2019. A personal resource for technology interaction: development and validation of the affinity for technology interaction (ATI) scale. *International Journal of Human-Computer Interaction*, 35(6), pp.456-467.
- Giroud, A. and Ivarsson, I., 2020. World Investment Report 2020: International production beyond the pandemic.
- Hanna, R., Hayter, R. and Clapp, A., 2017. Threshold Firms: Innovation, Design and Collaboration in British Columbia's Forest Economy. *Growth and Change*, 48(4), pp.700-718.
- Ismatov, R.O., Dadaboev, T.Y. and Karabaev, S.A., 2019. Investment possibilities in agricultural networks. *Theoretical & Applied Science*, (2), pp.350-355.
- Jafari-Sadeghi, V., Garcia-Perez, A., Candelo, E. and Couturier, J., 2021. Exploring the impact of digital transformation on technology entrepreneurship and technological market expansion: The role of technology readiness, exploration and exploitation. *Journal of Business Research*, 124, pp.100-111.
- Kurniawati, Y., Wigati, M.R. and Hasri, S., 2021, February. Information and communications technology (ICT) based of chemistry instructional learning design for students with multiple intelligence. In *Journal of Physics: Conference Series* (Vol. 1779, No. 1, p. 012062). IOP Publishing.
- Liu, H., Cao, C., Huang, J., Chen, Z., Chen, G. and Lai, Y., 2020. Progress on particulate matter filtration technology: basic concepts, advanced materials, and performances. *Nanoscale*, 12(2), pp.437-453.
- Mgonja, C., 2017. Enhancing the university-industry collaboration in developing countries through best practices. *International Journal of Engineering Trends and Technology (IJETT)*, 50(4), pp.216-225.

Miteva, K., 2019. Production of sustainable energy from solid waste by pyrolysis: A review. *Recycling and Sustainable Development*, 12(1), pp.69-77.

Mudiarasan Kuppusamy, Pritchard Muzanarwo 2021, Digital Resilience Capability: A criterion for perpetual digital transformation. In the national digital infrastructure plan. pp 40-44.

Ning, L. and Wang, F., 2018. Does FDI bring environmental knowledge spillovers to developing countries? The role of the local industrial structure. *Environmental and Resource Economics*, 71(2), pp.381-405.

Okhrimenko, E.I. and Chernov, S.A., 2020, January. A Factor Approach to the Study of the Economic Security System of a Municipal Unit. In *First International Volga Region Conference on Economics, Humanities and Sports (FICEHS 2019)* (pp. 214-217). Atlantis Press.

Pak, A., Adegboye, O.A., Adekunle, A.I., Rahman, K.M., McBryde, E.S. and Eisen, D.P., 2020. Economic consequences of the COVID-19 outbreak: the need for epidemic preparedness. *Frontiers in public health*, 8, p.241.

Panetta, F., 2018. 21st century cash: Central banking, technological innovation and digital currencies. *Do We Need Central Bank Digital Currencies*.

Porter, M.E. and Kramer, M.R., 2002. The competitive advantage of corporate.

Porter, M.E., 1985. Technology and competitive advantage. *Journal of business strategy*.

Porter, M.E., 1990. The competitive advantage of nations. *Competitive Intelligence Review*, 1(1), pp.14-14.

Porter, M.E., 2011. *Competitive advantage of nations: creating and sustaining superior performance*. simon and schuster.

Prokopowicz, D., 2018. Procesy Konsolidacyjne I Koncentracja Kapitału Jako Istotne Usankcjonowane Normatywnie Ekonomiczne Determinanty Procesów Globalizacji Ekonomicznej Kształujących Rozwój Systemu BANKOWE-GO W POLSCE. *International Journal of Legal Studies (IJOLS)*, 4(2), pp.217-244

Psacharopoulos, G. and Patrinos, H.A., 2018. Returns to investment in education: a decennial review of the global literature. *Education Economics*, 26(5), pp.445-458.

PwC ,2021. [online] Available at: <<https://www.pwc.in/press-releases/2021/global-workforce-trends-amid-the-pandemic-pwc-survey.html>> [Accessed 2 January 2021].

Rokicki, B. and Stępnia, M., 2018. Major transport infrastructure investment and regional economic development—An accessibility-based approach. *Journal of Transport Geography*, 72, pp.36-49.

Roztock, N., Soja, P. and Weistroffer, H.R., 2019. The role of information and communication technologies in socioeconomic development: towards a multi-dimensional framework.

Salim, Z.T., Hashim, U., Arshad, M.M., Fakhri, M.A. and Salim, E.T., 2017. Frequency-based detection of female Aedes mosquito using surface acoustic wave technology: Early prevention of dengue fever. *Micro-electronic Engineering*, 179, pp.83-90.

Strohmaier, R., Schuetz, M. and Vannuccini, S., 2019. A systemic perspective on socioeconomic transformation in the digital age. *Journal of Industrial and Business Economics*, 46(3), pp.361-378.

Sturgeon, Timothy. "Digital global value chains: The location of manufacturing and innovation in the new digital economy." In *31st Annual Meeting*. SASE, 2019.

Toader, E., Firtescu, B.N., Roman, A. and Anton, S.G., 2018. Impact of information and communication technology infrastructure on economic growth: An empirical assessment for the EU countries. *Sustainability*, 10(10), p.3750.

Tselios, V. and Tompkins, E.L., 2020. Can we prevent disasters using socioeconomic and political policy tools?. *International Journal of Disaster Risk Reduction*, 51, p.101764.

Walsh, M.N. and Rumsfeld, J.S., 2017. Leading the digital transformation of healthcare: the ACC innovation strategy. *Journal of the American College of Cardiology*, 70(21), pp.2719-2722.

Zafar, S., Lai, Y., Sexton, C. and Siddiqi, A., 2020. Virtual Reality as a novel educational tool in pre-clinical paediatric dentistry training: Students' perceptions. *International journal of paediatric dentistry*, 30(6), pp.791-797.

Zhou, Q., Deng, X., Jin, R. and Chang, T., 2019. Analyzing the key drivers of contractors' temporary competitive advantage in the competition of international high-speed rail projects. *KSCE Journal of Civil Engineering*, 23(11), pp.4579-4591.