
Editorial: COVID-19 pandemic, digital economy and entrepreneurship: unlocking the potential for digital and green futures

Introduction

Research and innovation policies, priorities, strategies and investments will drive the recovery of economies and societies in post-pandemic age, unlocking the potential of advanced technologies and paving the way towards a greener and digital future (Almunawar and Anshari, 2023; European Commission, 2020; Ferreira *et al.*, 2024; Sharma *et al.*, 2022).

Under the funding programme Horizon Europe (2021–2027), the European Union invests in research and innovation to tackle important global challenges. With a budget of €95.5bn, Horizon Europe addresses climate change, supports R&I and contributes to the creation of new jobs and a greener future for people (European Commission, 2024). In the R&I policy of the EU (European Commission, 2020:5), there are seven general objectives:

- (1) a European green deal;
- (2) a Europe fit for the digital age;
- (3) an economy that works for people;
- (4) promoting our European way of life;
- (5) a stronger Europe in the world;
- (6) a new push for European democracy; and
- (7) a modern, high-performing and sustainable European Commission.

The five mission areas of Horizon Europe are:

- (1) adaptation to climate change;
- (2) cancer;
- (3) healthy oceans, seas and coastal and inland waters;
- (4) climate-neutral and smart cities; and
- (5) soil health and food (European Commission, 2023).

How can companies and countries navigate and accelerate the transition towards the green and digital age? How can they become innovation leaders? Sharing innovative theoretical frameworks, ideas and experiences will provide a wide variety of stakeholders (academics, researchers, CEOs, entrepreneurs, innovators, policymakers and others) new knowledge and advanced views to understand the opportunities and challenges in the field of science and



This paper forms part of a special section “Digital innovation, entrepreneurship and research: Accelerating solutions to deal with COVID 19 pandemic and the future for global economies”, guest edited by Patricia Ordóñez de Pablos and Florinda Matos.

technology. Through active dialogue and engagement, relevant stakeholders will develop a deep understanding of the importance of building scientific collaborative networks, fostering and retaining strategic human capital and investing in research and innovation (Ordóñez de Pablos, 2004a, 2004b; Lytras and Ordóñez de Pablos, 2008; She *et al.*, 2014; Zhao *et al.*, 2014; Zhang *et al.*, 2012, 2022, 2023, 2024).

We hope this issue of *Journal of Science and Technology Policy Management* stimulates debate about the future of research and innovation and contributes to lay the foundations for greener and more inclusive economies and societies in Asia and beyond.

Contents of the issue

The third issue (2024) of *Journal of Science and Technology Policy Management* presents a collection of ten papers. The papers address vital issues for companies, governments and citizens, like artificial intelligence, digital businesses, digital economy, digital transformation, economic growth, entrepreneurship, intellectual capital protection, R&D expenditure, smart growth, sustainable growth and telemedicine. The discussion covers countries like India, Pakistan and South Korea. The issue includes a special section on “Digital innovation, entrepreneurship and research: Accelerating solutions to deal with COVID 19 pandemic and the future for global economies”.

In the special section titled “Digital innovation, entrepreneurship and research: Accelerating solutions to deal with COVID 19 pandemic and the future for global economies”, five papers discuss key issues about COVID-19 pandemic, digital economy and digital transformation in a rapidly changing environment.

The paper titled “Responding to the Covid-19 crisis: The rapid turn toward digital business models” (by Kronblad and Envall Pregmark) observes that “the effects of the spread of COVID-19 across the world are devastating, both from a health and an economic perspective. However, we also see encouraging examples of collaborative and innovative initiatives, in society and in organizations. The purpose of this paper is to focus on initiatives related to digital business model innovation. The authors explore how organizational characteristics provide a variety of opportunities for digital responses to the COVID-19 pandemic and discuss the potential consequences for the speed of digital transformation in organizations and society. In this paper, the authors analyze how organizations attempt to mitigate the negative effects of fighting COVID-19 using digital business model responses. The authors draw on a qualitative study where they have collected data from the retail and service industries. They have analyzed the data in relation to theory to better understand this ongoing phenomenon. The authors have identified four categories of organizations (crisispreneurs, accelerators, endurers and thrivers). Each category faces different challenges and shows a different intensity in their digital transformation. The authors propose that the rapid turn toward digital business models will have enduring effects, as organizations have gained transformational capabilities that will remain, and that the digital trajectory has, as a result, changed forever”.

The paper titled “Innovation in pandemics: a netnographic approach to the sharing economy contributions” (by Belezas and Daniel) warns that “pandemics are a serious challenge for humanity, as their social and economic impacts can be tremendous. This study aims to understand how innovation based in the sharing economy (SE) business models can contribute to overcoming the challenges arising from the Covid-19 pandemic. Following a netnographic approach, the authors studied the computer-mediated social interactions of internet-based virtual innovation communities. This study found that the SE business models contribute to overcome the challenges of the Covid-19 pandemic by redistributing idle resources to lessen the impacts of confinement. This was achieved through process innovations and an innovative use of the network, which enabled fast-open and

decentralized innovation processes, and quick implementation of innovations. This innovation process is based on a decentralized decision-making approach, clear rules, informal relationship among community members and open communication channels, as well as in evasive strategies to avoid facing challenges, institutional restrictions and barriers in the adoption of innovations”.

The paper titled “ICT-enabled organisational flexibility to support sustainable growth in Europe amidst a pandemic” (by Slabe-Erker and Primc) affirms that “information and communications technology (ICT) is helping to create a sustainable information society and foster development. This study aims to investigate the interdependencies of organisational flexibility enabled by ICT, demographics and containment measures in the ever more dismal economic performances seen during COVID-19 with a view to preparing socio-economic systems for similar future shocks. Using non-classical fuzzy-set qualitative comparative analysis, the authors are able to capture the asymmetric relationships and complexities found in real life. Analysing data acquired from the Oxford COVID-19 Government Response Tracker and Eurostat, the authors find these conditions give mixed results depending on how they are combined. The results imply that countries under strict containment measures might only be able to survive when fully equipped with ICT solutions. E-commerce also plays an important role in countries with a below-average decrease in their growth rate. Put differently, the presence and absence of telework produces mixed results. If the population is old, telework seems to generate the desired outcomes. Yet, when the population is young, it might be more beneficial to avoid this practice”.

The paper titled “Artificial intelligence adoption in the post COVID-19 new-normal and role of smart technologies in transforming business: A review” (by Agarwal, Swami and Malhotra) provides “an overview of artificial intelligence (AI) and other AI-enabled technologies and to describe how COVID-19 affects various industries such as health care, manufacturing, retail, food services, education, media and entertainment, banking and insurance, travel and tourism. Furthermore, the authors discuss the tactics in which information technology is used to implement business strategies to transform businesses and to incentivise the implementation of these technologies in current or future emergency situations. The review provides the rapidly growing literature on the use of smart technology during the current COVID-19 pandemic. The 127 empirical articles the authors have identified suggest that 39 forms of smart technologies have been used, ranging from artificial intelligence to computer vision technology. Eight different industries have been identified that are using these technologies, primarily food services and manufacturing. Further, the authors list 40 generalised types of activities that are involved including providing health services, data analysis and communication. To prevent the spread of illness, robots with artificial intelligence are being used to examine patients and give drugs to them. The online execution of teaching practices and simulators have replaced the classroom mode of teaching due to the epidemic. The AI-based Blue-dot algorithm aids in the detection of early warning indications. The AI model detects a patient in respiratory distress based on face detection, face recognition, facial action unit detection, expression recognition, posture, extremity movement analysis, visitation frequency detection, sound pressure detection and light level detection. The above and various other applications are listed throughout the paper”.

The paper titled “Hotel Room Access Control: An NFC Approach Framework” (by JosephNg) includes a study that discusses that “security and flexibilities remain the main points of contention in the cordiality business. This research points to planning a framework that empowers hotel users to get to the room using a mobile access key. Advancing secured facilities, mobile phone ‘Near Field Communication’ (NFC) innovation as the entrance device

by carrying out an application containing an imitated mobile key for explicit verification access is used. The proposed system is evaluated by triangulation of experimental, numerical and rational evaluation using partial least square structural equation modeling (PLS-SEM) with Malaysian hotel guests and employees. The discoveries with the hypothesis supported validated that the suggested solution can eliminate physical cards, boost protection and encourage a contactless ecosystem. Theoretical, management and societal contributions are discussed here”.

Apart from the special section, the issue contains a collection of five regular papers.

The first paper titled “Assessment of awareness on IPR activities among Indian academics – a cross-sectional study” (by Ravi and Janodia) affirms that “protection of intellectual property (IP) is important to leverage its commercial potential. This study aims to examine and comprehend the level of understanding of intellectual property rights (IPR) among Indian academics. The study covers three main aspects – awareness level of IP among Indian academics, comprehending if the current state of knowledge about IP is useful for commercialization and whether the current knowledge of IP activities among Indian academics is sufficient to support their professional career and generate revenues from their inventions. A structured methodology was contemplated and applied. A cross-sectional study with a convenience sampling method was adopted. The duration of the study was six months from March to August 2021. A total of 500 Indian academics were approached, of which 116 responded with a response rate of 23.4%. A structured questionnaire was administered to the participants to understand their level of knowledge about IP. Furthermore, the data analysis was performed based on descriptive analysis. The study findings revealed that the awareness among the participants about IP was minimal. The underlying reasons could be academics did not focus on generating IP through novel research, awareness of basic knowledge about IP was considerably low and inadequate to support their professional career, primary focus was on which publications are considered as one of the important criteria for performance management, national policies do not encourage collaborative research between university and industry that may lead to potential IP generation and the Indian academic set-up expects multitasking by its faculty members”.

The paper titled “Entrepreneurship barriers faced by Pakistani female students in relation to their entrepreneurial inclinations and entrepreneurial success” (by Soomro, Abdelwahed and Shah) proposes that “the current environment is unhelpful to female entrepreneurs, and they need to overcome numerous barriers when starting their own businesses. In this study, the researchers investigated the significant barriers that Pakistani female entrepreneurs require to overcome in this respect. In this study, the researchers used a quantitative study and they used a questionnaire to survey the respondents and collect cross-sectional data. The researchers targeted female students who were undertaking bachelor’s and master’s degree programs in different Pakistani public and private sector universities. Accordingly, the researchers based this study’s findings on the usable samples received from 498 Pakistani female students. The researchers used a structural equation model (SEM) in this study and its findings highlight that aversion to risk (ATR) has an insignificant impact on entrepreneurial inclinations (EI). In addition, fear of failure (FoF), lack of resources (LoR), aversion to hard work and stress (ASH) and the lack of social networking (LSN) have negative and insignificant effects on EI. The ATR factor has an insignificant effect on entrepreneurial success (ES), whereas FoF, LoR, ASH and LSN are negative and insignificant predictors of Pakistani female students’ ES”.

The paper titled “Impetuses and constraints in the policy formation process of the international science and business belt in Korea” (by Lee) affirms that “Korea’s Institute for Basic Science (IBS), the first research institute dedicated to basic science in Korea, started

ten years ago as part of a science policy called the Science Belt. It is noteworthy that Korea, with a short history of basic science, established such a research institute exclusively for basic science within a short period of time and made it one of the representative institutions of basic science in Korea. This paper aims to uncover the impetuses and constraints surrounding the policy of Science Belt, centering on the IBS.Kingdon's stream theory is used to clarify the factors that acted as impetuses or constraints for the Science Belt. For the analysis, in-depth interviews with the active policy participants were conducted in addition to the thorough literature review. The interviews enabled an in-depth understanding of the underlying factors for the Science Belt and the actual procedures of the policy decision. This study found that the most powerful impetus in the Science Belt policymaking process was the President and a small group composed of a few scientists who played a leading role in the political stream. The constraint of the Science Belt was that the participation of scientist experts and governmental officials, the so-called invisible participants of Kingdon, was insignificant. In particular, there was no system in place to select policy alternatives for basic science through discussion between scientists and governmental officials".

The paper titled "A systematic review of telemedicine systems use barriers: primary health care providers' perspective" (by Tabaeian, Hajrahimi and Khoshfetrat) explores "barriers to the use of telemedicine systems in primary health-care individual level among professionals. This study used Scopus and PubMed databases for scientific records identification. A systematic review of the literature structured by PRISMA guidelines was conducted on 37 included papers published between 2009 and 2019. A qualitative approach was used to synthesize insights into using telemedicine by primary care professionals. Three barriers were identified and classified: system quality, data quality and service quality barriers. System complexity in terms of usability, system unreliability, security and privacy concerns, lack of integration and inflexibility of systems-in-use are related to system quality. Data quality barriers are data inaccuracy, data timeliness issues, data conciseness concerns and lack of data uniqueness. Finally, service reliability concerns, lack of technical support and lack of user training have been categorized as service quality barriers".

The paper titled "Impact of R&D expenditure on economic growth: evidence from emerging economies" (by Tung and Hoang) states that "emerging economies have been highlighted as an important growth source of the global economy. However, this group of countries has not received enough academic attention yet. Therefore, this study aims to identify the impact of research and development (R&D) expenditure on economic growth in emerging economies. The theoretical framework of the production function is applied to quantitatively analyse the impact of R&D expenditure on economic growth with a sample of 29 emerging economies in the period between 1996 and 2019. The panel cointegration test confirms the existence of long-run cointegration relationships between economic growth and independent variables in these emerging economies. Besides, the estimated results show that the national R&D expenditure has positive effects on economic growth from both direct and interaction dimensions. This evidence has filled the empirical research gap in the R&D-growth nexus in the case of emerging economies. Finally, while gross capital and education have positive impacts on growth, corruption has a harmful effect on economic growth in these countries. The results highlight that policymakers should enhance R&D expenditure and R&D activities as the key national development strategy. The investment in R&D not only helps emerging economies avoid the middle-income trap but also pushes these countries to successfully join the group of developed countries".

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