The Role of Technology and Innovation on the New Economy Transformation

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Abstract

Economic transformation is the continuity movement of resources from low to higher productivity activity which is crucial for creating employment and a more robust economy where little attention has been paid. Technology and innovation play a vital role in new economic transformation. This study will explore the pivotal role of technology and innovation on the new economic transformation highlighting their impact on productivity, employment and global competitiveness. The purpose is to understand how technological advancements transform the economy. The objectives will be characterized by digitalization, automation, and artificial intelligence (AI) and how they are redefining how businesses operate, government functions and individuals interact within the economies. This research seeks to identify the mechanisms through which technology will foster economic growth which will enhance productivity thereby generating new business models. Additionally, the study will analyse the role of technology and innovation in the transformation of the global economy discussing both theoretical perspectives and empirical findings to understand the opportunities and challenges posed by this new economic paradigm. The study theories included diffusion innovation theory and innovation theory. This study will employ an explanatory research design where case studies from different sectors will be analysed. The findings of the research outcomes will contribute to the literature on technology and innovation on the new economy transformation which will provide practical insights for organizations, leaders, policymakers, academicians and researchers who seek future research and interventions because of some of the challenges that may be posed. Additionally, the study will focus on future technological advancements and their impact on the new economic transformation. By understanding the role of technology and innovation in the new economy transformation, organizations can develop strategies that will foster economic growth and organizational productivity in order to transform the new economy. It is hypothesized that the role of technology and innovation will have a positive influence on the new economic transformation as the leaders and policymakers who will prioritize technology and innovation will improve on economic growth and organizational performance.

Key Words: *Technology, Innovation, New Economy, Transformation*

1.0 Introduction

Economic transformation is indispensable in enhancing the quality of economic growth, creating jobs and reducing poverty in a long-term, sustainable and all-encompassing way (McMillan et al., 2017). Economic transformation is a fundamental restructuring of the economy moving from the traditional models to the dynamic and diversified systems. Recently, technology and innovation have emerged as central forces in this process, reshaping industries, labour markets and societal structures. The integration of technology within the economic transformation has emerged in driving innovation and growth. Economic transformation is the interrelated process of structural change that accompanies economic development (Syrquin, 1988). Innovation is an ever-evolving force which has propelled societies towards prosperity thereby fostering resilience and adaptability. Innovation has been used widely as the central process in economic transformation, creating a competitive advantage for both companies and nations. Technology and innovation have been an important factor in new economic transformation because they can be used to answer some of the critical questions needed to transform the economy thereby enhancing the competitive advantage and economic growth of a country (Chen, 2017). Technology and innovation have brought about new changes in the organization's structure and the economic system.

The dynamics of economic transformation historically emanate from the shifts of agrarian economies to industrialized ones. Currently, economic transformation is characterized by a shift from manufacturing-based economies to knowledge-based economies which have been driven largely by digital technologies which include three factors namely; Technological advancement e.g. Artificial Intelligence (AI), machine learning, blockchain and Internet of Things (IoT) have created new business models and industries (Si et al., 2023). These technologies improve efficiency, reduce costs and open new markets Innovation is the application of technology to improve an existing procedure. Innovation in business models like platform economies which include Uber, Airbnb etc. utilize digital platforms to connect consumers and service providers directly bypassing traditional intermediaries and reshaping the entire industry. By introducing new technologies, automation and new processes, organizations can optimize their operations, reducing costs and in the long run increase their productivity (Rammert, 2021). Globalization and digital integration have enabled e-commerce across the border trade, information flow and collaboration in ways never before possible. The digital economy allows organizations to access global markets

and resources which contribute to faster economic transformation (Imdadullah, 2023). As economies transform, people and entities must embrace continuous learning and upskilling to remain competitive in the current job market (Fleurbaey, 2018).

In Kenya, there is a slogan of Bottom–Up Economic Transformation Agenda (BETA) which is geared towards economic turnaround and inclusive growth through a value chain approach. BETA is targeting sectors that have a high impact in driving the economic recovery. The objectives of BETA are bringing down the cost of living, creating jobs, improving foreign exchange balances, expanding the tax base and growth included. BETA can only be achieved through targeted investments which include five core pillars Agriculture, Micro, Small and Medium Enterprises (MSMEs), health care, digital superhighway and creative economy (The National Treasury and Economic Planning, 2024).

Innovation is divided into eleven different types. Incremental innovation which involves increasing concepts, products or services. Disruptive innovation creates new value chains by entering existing markets or creating new markets completely. Sustaining innovation is where existing markets are improved and expanded to meet the customer's needs and demands. Radical innovation which is similar to disruptive but differs because it uses revolutionary technology and new business models at the same time. Product innovation which improves the nature and characteristics of the product. Service innovation is where services of a client are improved. Process innovation combines the skills, technology and structure where products are produced and services are offered. Technological innovation is a critical success factor to increase market competitiveness because it includes new or improved technologies. Business model innovation implies a way companies work and make money and includes core values, strategies, resources, core channels and target customers. Marketing innovation where marketing mix is involved and includes price, product, location and advertising. Architectural innovation which reconfigures the existing product technologies that bring improvement of components some of which are not innovative e.g. computer network systems and flexible manufacturing systems. Lastly, social innovation that aims to better meet social needs rather than existing solutions e.g. working conditions, improved education, developing communities and improving good health.

.According to the new World Economic Forum Report, (2023), nearly 133 million jobs have been created while 75 million jobs have been displaced by AI, robotics and automation. Manual, low-

skilled jobs and middle-income roles like accountants, lawyers and insurance clerks will be affected the most in the next era. This creative destruction will require economies to adapt by reskilling and upskilling which will create new opportunities for organizations to leverage on digital platforms. Cloud computing and data analytics to improve efficiency, and personal offerings and explore innovative revenue streams. Education and training systems must evolve to prepare employees for a rapidly changing job market where the demand for skills in coding, data analytics, digital marketing and cybersecurity will continue to rise as technology permeates all sectors.

The role of technology and innovation has made positive impacts on the new economy transformation which includes enhancing service delivery as it allows citizens to access information and services online reducing paperwork. Technology and innovation enhance data-driven decision making which empowers policy makers to make informed decisions. Technology and innovation foster global competitiveness as well as opening new markets and creating new employment opportunities. Leading nations with technology like the United States, Germany, China and South Korea have leveraged the innovation ecosystems, research institutions and vigorous government policies to dominate emerging industries. Emerging technologies especially in Africa and Southeast Asia are also embracing technology to leapfrog traditional development paths. Mobile banking in Kenya like the Mpesa and e-commerce in Indonesia have rapid economic growth and integration in the global economy.

The role of technology and innovation has increased productivity because automation and digitalization of processes streamline operations which reduce errors and minimize manual errors thereby saving time and resources (Radicic & Petković, 2023). For example in agriculture where drones and sensors are used to monitor crops which enable farmers to maximize yields while minimizing the use of fertilizers and water. In manufacturing, smart factories employ AI-driven processes to improve operational efficiency and minimize downtime. Furthermore, it enhances collaboration and knowledge sharing among government agencies, stakeholders and citizens. In addition, it fosters research and development encouraging researchers, academicians and the institutions which lead to impactful breakthroughs (Duan, 2023). Moreover, the role of technology and innovation brings uniqueness, creativity and novelty that helps an organization to stand out from the competitors and vicariously contribute to increased revenue and market share thereby

giving the business a competitive edge. In addition, it helps organizations to fight uncertainties and stay relevant in times of adversity.

New technologies are major drivers of growth and development which will shape the new economic transformation. Recently, technology has garnered a lot of attention from policymakers, researchers, academicians, business leaders, business leaders and employees (Nübler, 2018). The role of technology and innovation has positively impacted economic transformation in shaping new industries and markets where the rise of the technological sectors especially companies that focus on AI, biotechnology and clean energy have been a driving force behind economic growth in various countries (Nabila et al., 2021). These industries not only generate direct economic value but also create new jobs that require reskilling and upskilling of employees in order to take on higher-value tasks and jobs that require unique human skills which will foster a shift in the composition of the workforce and spur additional innovation thereby disrupting processes, social innovations and skills (Cukier, 2019). For example in renewable energy that is driven by innovations in solar, wind and battery technologies which transforms global energy markets thereby reducing dependency on fossil fuels. Correspondingly, advancements in biotechnology are driving growth in healthcare and pharmaceuticals that lead to new treatments and curing formerly untreatable conditions.

The role of technology and innovation has made negative impact on the new economy transformation despite having positive impacts. One of the issues is changes in jobs and income because of job automation which includes Artificial Intelligence (AI) and robotics which are replacing simple labour and threatening jobs for human beings (Morikawa, 2020). The adoption of automation technologies has led to less demand of low skilled labour because of inconsistencies between employees' capabilities and automation technologies and innovation while the demand for highly skilled employees has continued to grow especially for those who know how to use the technology where most people will lose their jobs (Nakamura & Zeira, 2018). Additionally, ethical and regulatory concerns surrounding digital privacy, data security and AI decision have emerged (Ciarli et al., 2021). Additionally, there will be a lot of market competition, technological obsolesce which may provide a balanced viewpoint on the manifold aspects of economic transformation (Chibuike Daraojimba et al., 2023).

The role of technology and innovation has encountered the adoption of telework and distance work i.e. remote work that have enabled high interactivity and cooperation which where talent overcomes the geographical location. Environmental impact like production and disposal of electronic devices, data centres' energy consumption and the mining of rare earth elements contribute to environmental degradation. Digital divide where some regions have better access to technology and digital infrastructure than others. Bridging this divide will require significant investment in digital literacy, infrastructure and inclusive policies to ensure that all regions can benefit from technology and innovation. Consequently, the wage gap between the low skilled and the high skilled will widen in at the end the middle class in the overall economy which is likely to dwindle. The role of technology and innovation has disrupted traditional jobs by causing significant job displacement, a lot of conflicts and unstable jobs especially in the media, transportation and retail (Gautschi & Gautschi, 2016). For example Uber and Taxi operators, many brokers act as agents connecting between demanders and suppliers of services through information communication technology (ICT).

2.0 Literature Review

This theory was developed by Sociologist Everett Rogers (1962) and explains how over time an idea or a product gains momentum and diffuses through a specific population or social system. The sociologist described five stages of adopting innovation which included awareness, interest, evaluation trial and adoption. The result is adopting a new idea, behaviour or product. The author further explained that the theory has a process where some people are more appropriate to adopt the innovation than others. Adopting new products, services or ideas is a phenomenon that does not happen overnight nor does it happen simultaneously across all people in the social system. The model has been used widely in communication and management studies as is presented as a sequence of stages like having awareness, having interest, being persuaded, making decisions, adopting and confirming (García-Avilés, 2020).

Diffusion of innovation theory is divided into five adopters and includes; innovators who are the first to adopt innovation, followed by early adopters who are opinion leaders and often have a higher social status. The early majority then adopted innovation after it became more widely known. The late majority then follows who may adopt the innovation due to peer pressure or economic necessity. Laggards are the last to adopt the innovation because of traditional values and

scepticism towards change. The theory stresses on the importance of communication and social influence in the adoption process because innovations are frequently adopted through interpersonal communication like through word of mouth and media in order to create interest and raise awareness.

The theory has some limitations like the assumption of a homogeneous population where the curve assumes that all individuals in a population are the same and have equal access to information and make decisions based on the same criteria though in reality populations are heterogeneous and people may have different preferences, values and behaviours. The assumption of external factors influencing adoption like social, economic, and political where innovation is being introduced. The assumption on the impact of marketing and advertising which includes creating interest, raising awareness and influencing perception where overpromising or misrepresenting the benefits of innovation can lead to disappointment and disillusionment among and damage innovation's reputation. The assumption of social influence role where people or groups impact on individual's attitudes, beliefs and behaviours. The assumption of timing role which ensures that it aligns with market conditions and customer needs. The assumption of competition role which can drive innovation and improve the quality and features of products making them more desirable to adopters. The assumption of network effects where the value of a products or service increases as more people use it thereby creating a self–reinforcing cycle of adoption and diffusion (Mohammed, 2023).

Diffusion of innovation theory has been criticized for four reasons. Pro – innovation bias from researchers and advisers is directed to laggards who refuse to adopt new techniques that scientists consider appropriate (Vanclay, 1992). The word laggard seems to be emotionally laden and derogatory. Individual – blame bias where the blame is on specific individuals though the fault is from practitioners because of poor or unclear communication of innovation or sometimes being inappropriate while in the real sense, it can be from external factors. A recall problem occurs when adopters of innovation cannot accurately recall the exact time they adopted the innovation. The issue of equality which relates to socio – economic benefits of an innovation not equally being distributed through a given population and consequently widening the socio - economic gap because of the adoption of the innovation. Other criticism include linearity of the model meaning that innovation diffusion is unstructured, emergent phenomenon. Additionally, overestimating the

size of the potential population of adopters and underestimates the actual level of uptake (Kaine & Cowan, 2011).

The diffusion of innovation theory has various importance despite having many challenges and criticisms. The importance include helping marketers understand how trends occur and helps organizations to assess the likelihood of success or failure of their new introduction. Additionally, the ability to explain the spread of new ideas and focus on its social networks. Moreover, the early adopters who serve as opinion leaders sparkle on the initial "take-off" point in the innovation adoption process.

Innovation Theory

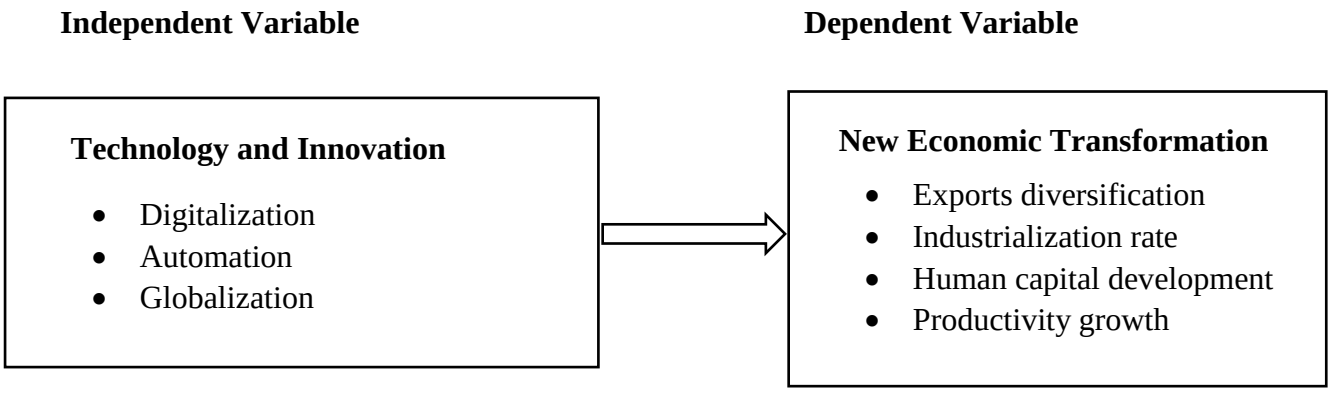
Innovation theory was propounded by Schumpeter (1927), who analysed that the process of technological transformation in a free market consists of three portions namely invention which includes conceiving a new idea or process, innovation which includes arranging the economic requirements for implementing an innovation and diffusion where people observe the new discovery and adopt or imitate it. The author defined innovation as doing things differently in the realm of economic life. Additionally, the author identified innovation as the critical dimension of economic transformation arguing that economic transformation revolves around innovation and entrepreneurial activities.

Innovation theory has been criticized in that it focuses on innovation functions and does not talk about other important and equally critical aspects of entrepreneurs like organization and management skills. The theory does not uphold the concept of risk-bearing as intensely as it does the idea of innovation as innovation comes first then risk-bearing. Additionally, the theory undermines or distinctly ignores the classical traits of businesses where the owner assembles and uses factors of production in creating a tangible product or service while in a real sense the theory indicates that innovators are true entrepreneurs towards economic transformation (Upadhyay & Rawal, 2018).

The importance of innovation theory is that it enhances the creativity and design thinking process of a brand. New businesses can attain the height of success by learning the steps of creativeness. The theory can open doors to various opportunities by helping businesses to keep up with the current trends. Additionally, the theory enables problem-solving and provides creative insights

that allow one to look things from a different perspective regardless of whether one is developing a new product refreshing strategy of finding an original way to stay ahead of the competition.

Conceptual Framework



Source: (Researcher 2024)

3.0 Methodology

This study aimed to examine the role of technology and innovation on the new economy transformation. Technology and innovation have been characterized by digital technology which includes Artificial Intelligence (AI), robotics and the Internet of Things (IoT). The study employed explanatory research design because the researcher wanted to know the cause-effect of the role of technology on the new economy transformation. Data collection method which was used by this study included secondary data collection method which were obtained from published sources from books, academic journals, industry reports, policy papers, case studies digital sources from the internet and websites, research databases, and surveys from both the public and private sectors as well as individuals.

Case studies were used because they are experimental research methods used to collect information about the occurrence and dissemination of and the relationship that exists between variables in a pre-determined population. The case studies included companies undergoing economic transformation where the key sectors include manufacturing, green energy and financial institutions. The researcher used a mixed–methods approach where a combination of qualitative case studies of Information Technology (IT) was employed since it sought to gain insights and understand people's experiences and perspectives. The researcher wanted to study social

organizations and human behaviour and the focus was on people's beliefs and emotional responses. The quantitative analysis focused on the economic transformation where gross domestic product (GDP) growth, productivity rates, employment trends and investment in research and development were analysed. Data was sourced from international databases from the World Bank, OECD and IMF.

4.0 Results and Discussion

To examine the role of technology and innovation on the new economic transformation, the study got findings and results from the secondary data obtained from journals from previous studies and the internet. Technology and innovation have been widely used by both the public and private sectors. The results of the study indicate that the technology will improve production efficiency by automating repetitive tasks, especially in the manufacturing industries where automation and robotics will allow organizations to gauge production which will reduce labour costs and increase productivity. In the financial sector, disruptions because of blockchain technology that has revolutionized payment systems and decentralized financial transactions. Additionally, Artificial Intelligence learning will assist businesses in processing large amounts of data thereby making more informed decisions that will improve efficiency and allocating resources.

The results of this study indicate that the role of technology and innovation in the new economy will disrupt the traditional employment patterns because Artificial Intelligence and automated machines will eliminate certain types of jobs like accountants, insurance clerks, and lawyers just to mention a few from the middle class income earners unless they reskill or upskill so that they can take on high value tasks and jobs that will require unique human skills that will adopt a shift in the composition of the workforce that will spur up innovation. The rise of gig economies and remote work that have been facilitated by digital platforms has also reshaped the labour dynamics. Additionally, the role of technology and innovation has disrupted traditional jobs by causing significant job displacement, a lot of conflicts and unstable jobs especially in the media, transportation and retail. For example Uber and Taxi operators, many brokers who act as agents connecting demanders and suppliers of services through information communication technology (ICT) have swindled many people with overseas jobs, how to make money using technology where in the real sense these agents are the ones benefiting and their clients losing. A good example is

the case study of Uasin Gishu County where people were swindled with overseas scholarships and jobs.

The results further indicate that the role of technology and innovation will enhance global competitiveness where new markets will be opened that will create new employment opportunities. Leading countries have leveraged on the innovation ecosystem research institutions and vigorous government policies so that they can dominate on emerging businesses. For example mobile banking in Kenya like the Mpesa has rapidly grown economically and integrated in the global economy. This has encouraged partnership and knowledge sharing among nations, government institutions, businesses and individuals.

The role of technology and innovation in the new economy transformation will promote research and development that will encourage organizations to invest in developing new technologies. Additionally, collaboration between universities, research institutions are private organizations can also accelerate the commercialization of breakthrough innovations. Additionally, technology and innovation will ensure inclusive growth where policymakers must implement strategies that will ensure that the benefits of economic transformation are widely shared and support small and medium-sized enterprises (SMEs) in adopting technology. Moreover, addressing the risks that are associated with new technologies, the government should develop comprehensive frameworks that should ensure the ethical use of artificial intelligence, protecting data privacy and preventing monopolistic practices in businesses with technology. Global collaboration on technology governance will also be critical in managing cross–border challenges.

5.0 Conclusion and Recommendations

The repercussions and pace of technology and innovations have disrupted organizations and are still increasing. Organizations need to be prepared for this challenge. The study concluded that technology and innovation will continue to shape the landscape of the new economic transformation in the years to come. The growth of e-commerce has been associated with the emergence of a whole value chain that must be properly integrated to provide a differentiated shopping experience for the customer. Embracing the evolving technologies and being innovative will require active efforts from the government, businesses and individuals. Technology and innovation are critical drivers of economic transformation in the 21st century. They enhance productivity, create new industries, and foster global competitiveness. However, the benefits of

technological transformation must be managed to ensure inclusivity and sustainability. As economies continue to evolve, strategic investments in education, research and development (R&D), and infrastructure will be essential to harness the full potential of technology and innovation for economic growth and societal progress. Governments, businesses, and individuals must work together to shape a future where technology serves as a tool for prosperity and human advancement.

Recommendations

In order to navigate on technology and innovation on the new economy transformation, there will be a need on collaboration and partnerships from the government, businesses and individuals who can drive innovation. Investing in education and workforce development where government and businesses should prioritize in education systems that emphasize STEM (Science, Technology, Engineering and Mathematics) skills. Additionally, lifelong learning programs, vocational programs and apprenticeships which are essential to help employees adapt to the need of prioritising in updating their skills and remain relevant with the ever-evolving job market and this will need government and business input by investing in education and training programs that will equip people with future - proof skills.

Promoting research and development in order to foster innovation. Tax incentives, grants and public-private partnerships can encourage organizations to invest in developing new technologies and business models. Collaborating with universities, research institutions and private companies can also hasten the commercialization of breakthrough innovations. Additionally, ensures inclusive growth where policymakers must implement strategies by ensuring that the benefits of technological transformation are widely shared. This includes expanding digital infrastructure to underserved areas, providing access to affordable internet and supporting small and medium-sized enterprises (SMEs) in adopting technology.

The government must take the lead in adapting policies and regulatory frameworks for emerging technologies. These regulations should ensure the ethical use of Artificial Intelligence (AI), protect data privacy and prevent monopolistic practices in the technology industry. In order to keep up with the pace of technological advancements which will ensure a balance between innovation and public interest, fair competition as well as protecting the customers. Alongside adapting policies

and regulations, the government must also make efforts in minimizing digital divide which will ensure inclusivity of accessing and encouraging businesses to design their products and services by including diverse user needs and demographics. The government must ensure that ethical considerations and implications have been adhered to. Global cooperation on technology governance will also be critical to managing cross–border challenges.

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