DIGITALIZATION AND SUSTAINABILITY: EXPLORING THE INTERCONNECTION FOR A SUSTAINABLE FUTURE

Anika Gandhi[*]
Lopa Mudra Das[**]

Abstract

We currently exist in a globe where automated systems are moving fast and they are having a big influence on the economy how countries are run and how people live. As things are changing people are getting more worried about the earth getting hurt the weather changing and some individuals possessing fewer resources than others. This research paper is about the way automated technologies and being sustainable connected and it looks at how latest digital innovations can help make the world a better place, for everyone specifically focusing on digitalization and sustainability.

This study looks at one hundred and fifty three research articles that were published between 2015 and 2024. The work reveals that there are multiple advances artificially intelligent technologies, encompassing big data analytics, blockchain technology, the internet of things, and cloud computing, that allow us to have better usage of our resources (which are more openly available to us), and assist individuals with making informed decisions from data-informed analysis to develop more sustainable practices. Artificial Intelligence and Internet of Things and other technologies like these are really helpful, for practices. The study also addresses a few problems at the time. These problems include waste that is getting worse using a lot of energy risks, to cyber security and the digital divide that will not go away. The digital divide is an issue and the paper is looking at the digital divide and how it affects people. The paper is also looking at waste and how it is a problem that needs to be solved.

The study says that digitalization is really good for sustainability if we have the rules in place and people know how to use technology. Digitalization can make a difference. The study gives us a few helpful recommendations to people who make decisions people who do research and people who put plans into action to create a future that is good, for everyone and sustainable. Digitalization is important here.

Keywords: Artificial Intelligence, Big Data Analytics, Blockchain Digitalization, Internet of Things, Sustainability, Sustainable Development Goals

INTRODUCTION

Digitalization is really changing the world we live in.[1] It is one of the things that is happening today. The way digital technologies are growing and getting better is very fast. This has changed the way businesses work the way governments make decisions and the way people talk to each other.[2] Companies are using tools more and more to get things done faster to make their customers happier and to make good choices. Digitalization is helping them to do all these things. Governments are also using platforms to develop an easier environment

[*] Ph.D. Scholar, Department of Social Work, NIMS University, Rajasthan, Jaipur
[**] Assistant Professor, Department of Social Work, NIMS University, Jaipur, Rajasthan
[1] S. Brennen and D. Kreiss, "Digitalization" in *The International Encyclopedia of Communication Theory and Philosophy* (Wiley-Blackwell, 2016).
[2] G. Vial, "Understanding Digital Transformation" (2019) 43(1) *MIS Quarterly* 223.

DOI NO. - 10.5958/2582-7529.2025.00001.8

for individuals to be more open and to let people have a say in what happens. Digitalization is very important, for governments too. The world is handling difficulties like atmospheric variation and running out of natural resources. We are also seeing a lot of pollution and individuals are unable to earn money. So sustainability is an issue that everyone is talking about when it comes to developing the world.[3] Digitalization is seen as a way to help the economy grow without hurting the environment or society. The world needs to figure out a solution to make sustainability work, with digitalization to make things better. Sustainability is very important for the world and digitalization can help with sustainability. Digital technology through AI, IoT, Blockchain,[4] and Big Data is facilitating our monitoring of usage, enhancement of waste reduction, improvement of supply chain management and supporting sustainable development initiatives.[5] Digital technology has certainly provided usefulness concerning these functions. The availability of digital technologies varies by community so some communities have a greater advantage than others. However; challenges are also arising due to the continued increase in digital technologies that must be addressed before sustainability can be assessed with respect to digital technologies.

OBJECTIVES OF THE STUDY

The main objectives of this study are:

- To evaluate the relationship between digitalization and sustainability.
- To explore the role of emerging digital technologies in promoting sustainable development.
- To identify key challenges and barriers to digital sustainability.
- To suggest strategies for integrating digitalization with sustainability goals.

REVIEW OF LITERATURE

Digitalization is really helping us be more sustainable. We can see this from all the research that is being done on the subject. Numerous studies show that digital technologies make things work better and use energy by automating tasks and cutting down on waste.[6] For example systems that use the Internet of Things to monitor things can show us how resources are being used now. Artificial intelligence can help us make better predictions and plans. Digitalization is making a difference in many areas. Digitalization is helping us to be more sustainable, by using technologies to improve the way we do things. Research shows that blockchain technology helps enhance visibility and answerability across supply chains.[7] This is more prominent for things like farming making things in factories and transportation of goods. The advent of digital learning, digital healthcare and online banking has made access to education and healthcare available for broad sections of society. Providing widespread opportunity for people is good for the growth of blockchain technology and digital platforms, which rely heavily on the access people have to what they require. Unfortunately, access to digital infrastructure also has barriers that exist in both developed and developing countries, including India, Africa, etc.[8] In addition, problems related to

[3] United Nations, Transforming Our World: The 2030 Agenda for Sustainable Development (UN Publishing, 2015).
[4] S. Gupta, S. Modgil and S. Bhattacharya, "Impact of Internet of Things (IoT) on Supply Chain Management" (2020) 58(8) International Journal of Production Research 2357.
[5] N.P. Melville, "Information Systems Innovation for Environmental Sustainability" (2010) 34(1) MIS Quarterly 1.
[6] A. Hanelt et al., "A Systematic Review of the Literature on Digital Transformation" (2021) 58(5) Journal of Management Studies 1159.
[7] M. Kouhizadeh, S. Saberi and J. Sarkis, "Blockchain Technology and the Sustainable Supply Chain" (2021) 59(7) International Journal of Production Research 2069.
[8] J.M. Müller, D. Kiel and K.I. Voigt, "What Drives the Implementation of Industry 4.0?" (2018) 56(1–2) International Journal of Production Research 261.

DOI NO. - 10.5958/2582-7529.2025.00001.8

digital development must be thoroughly checked, including but not limited to the following: 1.) Data privacy and security; 2.) E-waste; 3.)[9] quantity of energy used by data centres. To ensure that digital development is available to all and equitable in nature we must conduct extensive research on the policy frameworks that will provide access to digital development and infrastructure, worldwide. Digital development is essential and it must be equitable for all therefore it is our goal to help develop digital infrastructure and provide access to digital development for all.

RESEARCH METHODOLOGY

The research for this project focused on examining existing literature regarding the relationship between digitalization and sustainability through journal articles found on databases like Scopus, Web of Science, Science Direct and Google Scholar. Digitalization was selected due to its relationship to the other literature.

DISCUSSION

The study shows that digitalization and sustainability are closely linked.[10] Digital technologies help companies use resources better cut down on waste and do a job of protecting the environment. Digitalization helps companies do things efficiently. For example Artificial Intelligence and Big Data Analytics are really useful, for finding out what individuals will want managing the things we have in stock and not making much of something which means we do less harm to the environment. [11]Digitalization and sustainability are really important so corporations should contemplate about the way digitalization can help with sustainability. The Internet of Things or IoT is really good at helping us keep an eye on how energy we use and the bad things we release into the air. This means we can do something about it away. Blockchain is also very useful because it helps us see what is going on in the supply chain. This means we can make sure that the things we buy are made in a way and that nobody is cheating. The Internet of Things and Blockchain are good for the economy and the earth. They help us use energy and make less waste. IoT and Blockchain are important, for our future. The discussion also talks about some problems. The fast growth of infrastructure uses a lot of energy especially in data centres.[12] The increasing amount of waste is very bad for the environment. Also people who use technologies are at risk because of cyber security threats and they do not have the right digital skills. The digital divide is still an obstacle to making sure everyone can be sustainable. Digital technologies are not being used effectively because of the divide and this is a major concern, for digital technologies and sustainability.

FINDINGS OF THE STUDY

The key findings of the work are:

Digitalization is really good for sustainability.[13] It helps people do things better and use resources. Digital efficiencies, thanks to digital technologies, have positive effects on

[9] T. Stock and G. Seliger, "Opportunities of Sustainable Manufacturing in Industry 4.0" (2016) 40 Procedia CIRP 536.
[10] G. George, R.K. Merrill and S.J.D. Schillebeeckx, "Digital Sustainability and Entrepreneurship: How Digital Innovations Are Helping Tackle Climate Change" (2021) 36(6) Journal of Business Venturing 106.
[11] S. Nambisan et al., "Digital Innovation Management" (2017) 41(1) MIS Quarterly 223.
[12] S.S. Kamble, A. Gunasekaran and S.A. Gawankar, "Sustainable Industry 4.0 Framework" (2018) 117 Process Safety and Environmental Protection 408.
[13] C. Bai, J. Sarkis and Y. Dou, "Sustainable Supply Chain Flexibility and Its Relationship to Firm Performance" (2017) 190 International Journal of Production Economics 48.

DOI NO. - 10.5958/2582-7529.2025.00001.8

sustainability by reducing resource consumption. Advanced digital technologies (such as AI, IoT and blockchain) can help us find sustainable solutions.[14] The impact of digitalisation on growth of sustainability is particularly evident in the sectors of manufacturing, logistics and energy through a huge variety of environmental benefits. However, there is a range of challenges to implementing sustainable solutions that include digital inequities, cyber security challenges and e-waste.

DIGITALIZATION AS A TOOL FOR INCLUSIVE AND SUSTAINABLE GROWTH

The study says that digitalization is a useful thing for making the world a better place. Digitalization can help the economy grow protect the environment and make sure everyone is treated fairly at the time.[15]Digitalization will only be good for us if we use it in a responsible and fair way. If we do not have the rules and systems in place digitalization might just develop new challenges and make some individuals worse off than others. Digitalization is a tool and we are required to be careful, with it. We have to ensure that digitalization helps everyone, not a few people. To really make transformation work in the long run governments and organizations need to make sure their digital plans line up with what they aim to achieve in terms of sustainability. They have to invest into things like technologies teaching people digital skills and building infrastructure that includes everyone. Digital transformation is very important. So is sustainability. There are many hurdles with digital transformation that must be addressed including: how much energy is used; what to do with e-waste; and how to protect all the data and devices we have from cyber threats. If governments and businesses can solve these issues, then there will be a good chance that digital transformation will occur.

RECOMMENDATIONS

Sustainability should be part of any government's digital transformation policy by setting up sustainability goals within the plans for transformation. This means that all future digital transformation policies must incorporate some level or form of sustainability. We also must invest more into infrastructure such as computers and internet access.. We should also teach people how to use these things. This is what I mean by literacy programs. So we should increase the investment in infrastructure and digital literacy programs. This will assist individuals in learning how to use things. Investment, in infrastructure and digital literacy programs is very important. Companies and businesses should use technology and find ways to save energy. This is a thing, for the environment. Organizations should really try to adopt technologies and energy-efficient ways of doing things. We really need rules to control waste and keep our personal information safe. Electronic waste is a problem and we have to do something about it. We have to make sure our electronic waste and personal information are handled properly. Electronic waste and data security issues are important things that we have to think about. We should really work on getting academia, industry and policymakers to work together. This collaboration, between academia, industry and policymakers is very important. We need academia, industry and policymakers to share ideas and help each other out.

[14] S.S. Kamble, A. Gunasekaran and S.A. Gawankar, “Sustainable Industry 4.0 Framework” (2018) 117 Process Safety and Environmental Protection 408.
[15] United Nations, Transforming Our World: The 2030 Agenda for Sustainable Development (UN Publishing, 2015).

DOI NO. - 10.5958/2582-7529.2025.00001.8