

## Trustworthy AI and Organizational Resilience: An Industry 5.0 Perspective on Sustainable Digital Transformation

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### ABSTRACT

The swift advancement of Artificial Intelligence (AI) is compelling organizations to use AI-based systems for performing different organizational functions. Furthermore, AI adoption is driving a rapid and widespread digital transformation across the industrial spectrum. Lately, people have grown increasingly concerned with the transparency, accountability, fairness and reliability of the AI. It is necessary to develop trustworthy artificial intelligence. A quantitative research approach was used. Information was collected through a structured questionnaire from 250 managers, IT professionals, and practitioners involved in digital transformation. Data analysis indicated that trustworthy AI and organization resilience are positively and significantly associated with sustainable digital transformation. Furthermore, the results of the findings show that transparent and ethical use of AI can improve trust of stakeholders, inspire human centric innovation and enhance organizational agility in disruptive situations. According to the study, AI enables technology to become resilient and sustainable, allowing firms to maintain their long-term competitiveness while developments are kept human-centric, sustainable and resilient by the technology as per Indus try need.

**Keywords:** Trustworthy AI, Organizational Resilience, Industry 5.0, Sustainable Digital Transformation, Human-Centric Innovation, Stakeholder Trust, Artificial Intelligence.

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### Introduction

Digitalization has increasingly become a key driver of organizational growth and development in recent years. For example, businesses are depending on sophisticated technology solutions for improved operational efficiency, scientific decision making and more. In addition, businesses are increasingly utilizing technology to remain competitive and manage market volatility. These days, the use of such technologies and IT tools is immense. One exceptional powerful technology is Artificial Intelligence. Artificial intelligence or AI is a term that refers to intelligent systems that perform human-like functions. Today's organizations are leveraging AI based system to record, analyze and interpret data. For instance, businesses utilize these systems to make rapid predictions and perform

effective actions. Moreover, AI is a vital part of many sectors and industries. It plays a vital role in processes such as customer service, supply chain, healthcare, finance, manufacturing, and strategy planning. Additionally, artificial intelligence application continues to evolve and extend in different sectors and fields. The article discusses the concept of trustworthy AI and is an insight into the world of AI.

Increasing use of AI based systems are providing benefits to the organization. In the first instance, the human intervention in repetitive jobs gets lowered. Then, it helps enhance decision-making by improved analysis and predictions. Moreover, it offers functionalities that assist with a variety of specialist tasks. It mainly improves operational performance and reduces the influence of human error. With all these benefits, a big problem comes forth. Numerous organizations currently employ intelligent AI systems to oversee communications, processes, and organizational tasks.

Trustworthy AI is pivotal for a future we want to build, where technologies serve humanity for the common good. Moreover, it is important for these principles to be integrated into the AI systems resulting in reliable, understandable, fair, secure, transparent and accountable functionality. According to a study, trust is a key driver of technology adoption because organizations are more likely to accept technology when they understand how decisions are made. Moreover, members of the public must believe that the decisions are correct and just. As AI becomes increasingly prevalent in the workplace, organizations must commit themselves to trustworthiness in AI development to avoid damage to corporate reputation and performance.

Businesses today are facing a heightened level of uncertainty. Multi-faceted globalisation, economic unpredictability, technological disruptions, cyber threats, environmental imbalances and unanticipated crises are creating fresh challenges for worldwide organisations. The supply chains, business processes, and the performance of the organization get disturbed due to COVID-19 at a faster speed. At the same time, organizations need to demonstrate increasing resilience to such disruptions. Organizational resilience is the ability to recover or adapt to unexpected disruptions in order to eventually achieve the organization's longer-term objectives. Such disruptions can include financial crisis, scandals, adverse weather events, and more.

Resilient organizations emerge stronger because they learn from challenge. Digital technologies can certainly enhance and increase organisational resilience. Highlights of the Reports Advanced analytics, AI, cloud, and intelligent automation are enabling organizations to visualize operations in real time, identify threats and make informed decisions on time. Essentially, AI has the attributes to build organizational resilience. How much anybody benefits from AI depends on how much they trust it. If AI systems and their providers are deemed untrustworthy, these benefits will be dramatically reduced. In addition, the negative impacts of Artificial Intelligence can be minimized to a great extent by embedding trustworthiness. Sure, the paper has discussed trustworthy AI and organizational resilience. Of course, Industry 5.0 has made the conversation relevant. Manufacturing technology has become largely automated and connected thanks to Industry 4.0. The development of technology that includes humans at the center stage is promoted by Industry 5.0. Basically, in Industry 5.0, organizations are encouraged to integrate and complement advanced technologies with human and social values. For sure, Industry 5.0 combines human creativity and social and environmentally sustainable practices with technologies of Industry 4.0.

The core belief of Phrase Humble Assertion is that technological and organisational advancement must be pursued with positive intentions. In essence, it must become an agent of social goodness and sustainable development rather than an agent of economic growth. Moreover, any future organization must be complex but at the same time agile. In other words, they need to be able to deal with complex problems and also remain committed to their values and sustainability.

There is no doubt that AI has caused a transformational change. Nevertheless, "agent of change" is generally regarded as the agent being an end and not a means. Put in different words, one should not regard AI as an end anymore. It must be used as a means to certain ends, such as responsible innovation. For example, human judgment must prevail over AI. It should help everyone to make better decisions.

Considering the emergence of digital transformation and the dilemmas, there is a need for a new industrial revolution and organizational resilience. The trustworthy artificial intelligence can help with both. Industries are facing issues caused by digital transformation and artificial intelligence which affects sustainability. These challenges require a new industrial revolution to overcome. Industry 5.0 is an example of a revolution that will promote the cooperation of people and machines. Organizations need to grow resilient for the sustainable development of industries. An organization's resilience can help it in risk mitigation, continuous evolution, rapid recovery and value preservation.

Reliable AI can expertly perform all these functions effectively. As such, dependable artificial intelligence (AI) can play an important role in the new industrial revolution and organizational resiliency. Despite academia studying AI, resilience and Industry 5.0, the problem continues to persist. Experiencing obstacles and challenges is a no-brainer due to the digital transformation. Organizations are, thus, in need to develop resilience to overcome such challenges to be able to survive. Furthermore, artificial intelligence is not fully reliable as it faces many problems. Trustworthiness in AI is gaining prominence, yet it is difficult.

In the same way, Industry 5.0 is becoming important but no organization is obtaining it using bigdata and analytics. Multiple studies involve the interplay between AI and resilience or AI and Industry 5.0, but none of them examine the relationship between all 3 concepts.

The days when organizations simply adopt technology without thinking are long gone. Now, organizations must use technology responsibly and strategize around it. The technological revolution is quicker than any others in history. AI which is trustworthy, powered by Industry 5.0 can drive better resilient and sustainable organizations which are more human-centric and capable of dealing with the complexities of a hyperconnected world.

### Literature Review

Modern organizations face intensified competition and the need to constantly adapt to changing environmental conditions as digital technologies evolve at an exponential rate. Artificial intelligence, digital transformation, organizational resilience and sustainable development have been published. This is a lot in recent years. With the dawn of Industry 5.0, the variety of these research papers has increased further. In addition, a thorough investigation of the existing literature affirms that reliable artificial intelligence enhances organizational resilience and sustainable development in the face of digital transformation.

One of the earliest papers relating to organizational adaptability probably the most influential one is Teece's (2007) on dynamic capabilities. As per author organizations need constant alteration of their resources, knowledge, and competencies to survive in a rapidly changing environment. It allows the firm to recognize opportunities, respond to threats and reconfigure its internal processes when faced with uncertainties. In this age of digital transformation of computing and communication technologies where technology innovations are fast-printed, organization must be flexible to maintain competitiveness.

It is not merely the technological capacity but also the capacity of an enterprise to learn, adapt and innovate over time. The technological capacity to store, communicate and compute information of the world obtained again (Hilbert and López, 2011). We have seen over the time, the growing rate of technological marvel called digital technology is quite startling. Organizations and society are constantly trying to make huge amount from data for their benefit. The chance to do a new thing has been very useful. The findings show that information has become a great strategic resource and organization can therefore using the ever-changing technology that includes artificial intelligence, big data, and cloud computing to get advantages. Enterprises that utilize big data analytics can be termed as intelligent enterprises. In our modern world, the dependence on digital technology has driven the innovation of worldwide information processing capacity. The proof of this statement comes from the increase in information-processing capabilities throughout the world. As time proceeds, we have enormous volume from data and manage them. The utilisation of digital technologies increasing so rapidly has taken us by surprise. The ecological resilience to the information's production and consumption can increase adaptive capacity. It is also possible through organizational learning. O' Reilly and Tushman's extensive review has been very significant to the management literature (2013). It has been discovered within the.

Ambidexterity refers to the capability of the firm to use (deploy) the emerging technologies within the organization and not disrupting the ongoing activities.

Digital technologies are being increasingly promoted for use in business globalisation in recent decades. Digital technologies are broadly defined as any technological developments that are based on, include, or use digital data, digital logic, or digital devices. Computers, mobile phones, tablets, Internet, social networks, cloud computing, artificial intelligence, machine learning, robotics and Internet of Things are some of these technologies. Organizational digitalization is the adoption of digital technologies worldwide business operations with the main intention of creating organizational value. Digitalisation allows a wide audience and the world to interact with digital devices and content. The process of interacting enables the innovative mix of digital and physical components in organizational processes, activities, products and services. Thus, these kinds of capabilities implanted within the organization help in developing innovations in the business model, organizational structures, production process, and internal management pathways.

Huang, Seck, and Gheorghe (2016) definition of trust in technology and its applications. Research was undertaken on creating a dependable cyber-physical-social system for the Internet of Things setting. The authors argued that today's intelligent systems must be designed to be trustworthy. People will trust technological systems which offer privacy, security, transparency and reliability. According to the authors, intelligent technologies need to be trusted to develop organizations. Organizations are using more connected digital technologies and infrastructure today.

Huang (2017) examines the role of intelligence in the process of organizational transformation. The writer claims that digital transformation could. The research refers to organisation transformation as an organisational process, using digital technologies (Vial 2019) to alter the business model, organisation setup and stakeholder contact. According to Vial (2019), transformation has two sides that offer new opportunities and challenges. Then the writer says that an organization undergoes metamorphosis. All stakeholders such as employees, top management and clients may oppose using analytics. Not everybody takes a change easily. Sometimes, using and understanding the advanced technologies gets difficult. The hassle caused in the production process. It is important to note that sometimes transformation does not have a positive impact on a firm's performance when it lacks a plan. In other words, the author concludes and here change needs potent leadership focus and motivation and clear-cut vision and future strategy.

The use of artificial intelligence by organizations raises ethical and governance issues. The Ethics Guidelines for Trustworthy AI were issued by the High-Level Expert Group on Artificial Intelligence (2019). Important principles have been established to ensure responsible AI development. These important principles are transparency, accountability, fairness, privacy, and human oversight. These principles have major impacts on discussions related to AI governance. The article mentions the importance of trustworthy AI development for human flourishing as well as prevention of a number of risks like those based on bias and discrimination, and lack of accountability. The author highlights how these principles can be applied by AI designers, developers, and policymakers.

According to Lee et al., organisations are beginning to derive value specifically from data driven prediction, automation and insights with the evolution of ai Tou Faily, Shau, & Howcroft, 2020. Application of ai can learn, adapt and perform a set of tasks similar to human cognitive processes. According to Jain and Sharma (2020), AI has transformed the operations of organizations and will keep altering the current dynamics way faster than before.

A report released by Gartner (2021) says that in, 75% of the large enterprises and 25% of the mid-sized enterprises would have used some form of AI and/or ML technology, an increase from 10% in the year 2020. Further, most of the AI mediated decisions will be tracked and measurable and this is possible with considered developing a robust framework for AI-related bias considerations Humphries et al., 2020. In the public sector, the implications of the AI are extensive. Federal and state governments have begun to implement AI technologies in health departments and various policy initiatives McOwen, Agrawal, & Mercer, 2020. Currently, several programs using AI are implemented in the day-to-day working of public administration. Systems that make automated decisions, predictive policing, facial recognition and chatbots, persuasive technology that nudges individual behavior towards government programs, constant monitoring platforms to combat corruption, and stereo-type audits.

The authors state that their research focuses on examining the way in which digital technologies and applications change the way customers experience companies, wishes to do business and how companies organise themselves internally. Furthermore, organizations should adapt to changes in market variables while simultaneously ensuring continuity of operations and maintaining a strategic managerial focus (Sebastian et al., 2017). Consequently, one could argue that digital transformation has become the process of managers and culture rather the process of a technology.

Industry 5.0 is a new area of study that presents a more elaborate view of industrial development. As European Commission (2022), the earlier idea of Industry 4.0 puts a priority on digitalization for more efficiency and automation. Conversely, Industry 5.0 wants to evolve production systems towards more sustainability, resilience and human centricity. The framework, in particular, fosters human machine collaboration while calling on organizations to use technology in ways that create social and environmental value. Consequently, it indicates an emerging understanding that these technological innovations must serve a greater purpose than merely improving productivity and fostering economic growth, as was previously the case.

Research from 2022 indicates that Industry 4.0 technologies improve organizational resilience. The research establishes that the deployment of technologies, like artificial intelligence, cloud computing, and data analysis, enhances the anticipation, response and recovery of an organization. Hence, the results.

In Díaz-Rodríguez et al. (2023), a broad study on trustworthy AI is presented. According to the authors, mere technical excellence is not sufficient. Given that the successful deployment and sustained operation of AI systems depend on social acceptance, accepting systems would be desirable from both a company and social standpoint. Similarly, Ahmed et al. (2023) noted how artificial intelligence can help strengthen organizational resilience in the workplace. The authors studied

techniques, tools, and approaches based on AI for Supply Chain Resilience in Industry 5.0. AI technologies can facilitate the enhancement of forecasting, risk assessment and adaptive decision-making. Thus, firms can adapt to interruptions and continue their operations amidst uncertainty.

According to Huang (2023), the future industry system must merge technological capabilities, ethical requirements and human-centred values. According to the research, trustworthy AI can serve as a bridge between technological innovation and responsible corporate behavior. In a like manner, Marinagi et al. (2023) examined the effect of Industry 4.0 technologies on supply chain performance. The research paper revealed that digital technologies increase operational flexibility, responsiveness, and resilience.

Novel technologies not only allow the emergence of unique products and services but they also improve various internal processes of companies. The researchers noted that firms utilizing these technologies possess the means to manage more successfully the complicated business environment. The study by Saeed et al. (2023) examined the link between digital transformation and cyber-security.

As noted in the case study, according to the authors, although digital technologies have generated many opportunities, the risk of cyber-attacks has also increased many folds. Organizations must create a cyber-security strategy to protect the company's assets, both material as well as immaterial. This will protect the reputation of the organization. Now, cyber security has become a must.

The future of a resilient manufacturing system by Leng et al. (2023). They proposed a decentralized autonomous manufacturing system for Industry 5.0. The group members provided the insights into how AI, digital twins, and smart decision-making systems design IM systems. According to them, flexibility and response times can be improved through the use of decentralised systems. They also lessen the dependence on centralized control mechanisms.

Researchers carried out a comprehensive survey on trustworthy and explainable artificial intelligence. The researchers emphasized the importance of explainability in AI systems to instil confidence and encourage responsible decision-making. According to the authors, explainable AI models are likely to have a higher acceptance rate among users, regulators, and organizational stakeholders. They are thus more apt for making the intelligent system uptake more extensive. That trustworthiness of artificial intelligence has become vital for sustainable digital transformation and organizational resilience. While we certainly made progress in understanding trustworthy AI, digital transformation, governance practices and Industry 5.0, there is scope for further study into how these actually interact with each other in real organisational contexts. As things stand now, the literature as a whole suggests that organizations may be able to achieve sustainable long-term resilience by adopting trustworthy AI. In other words, they can couple technology with ethics, values and business objectives by making use of trustworthy AI.

### Objectives:

The study's objectives include first exploring the role of Trustworthy AI practices in promoting organizational resilience in the context of digital transformation initiatives. The next objective of the paper is to investigate the association between Trustworthy AI adoption and sustainable digital transformation outcomes from the perspective of Industry 5.0. Ultimately, the AI model used in a process of human-centered development (HCD) should enable users of innovations to trust the innovation.

### Methodology:

This study seeks to evaluate the potential of Trustworthy AI for organizational resilience and sustainable digital transformation based on Industry 5.0. The research employs a quantitative research method. Data that were primary were collected via a structured questionnaire from 250 managers, IT professionals, digital transformation practitioners of manufacturing and service organizations. Selection of respondents was done through a convenience sampling technique. The researchers examined the data systematically by taking the help of descriptive statistics, correlation analysis and multiple regression to test the proposed objective.

### Result and Analysis

This section of the paper presents the analysis of data from 250 managers, IT professionals and practitioners of digital transformation. This study analyzes the influence of Trustworthy AI on institutional resilience and sustainable digital transformation from the perspective of Industry 5.0. Descriptive statistics were used to evaluate responder perception. On the other hand, the statistical analysis was used to check the relationship between different study variables. The findings provide evidence of the role of AI led trustworthiness in bringing about resilient, sustainable and confidence of stakeholders on institutions.\

**Table 1: Descriptive Statistics of Key Variables**

Variable	Mean	Standard Deviation
Trustworthy AI Adoption	4.12	0.68
Organizational Resilience	4.05	0.72
Sustainable Digital Transformation	4.18	0.65
Human-Centric Innovation	3.96	0.74
Stakeholder Trust	4.10	0.69

Based on the findings, the respondents’ strong agreement on the adoption of Trustworthy AI practices is reported with a mean value of 4.12. The greatest mean value (4.18) was scored by Sustainable Digital Transformation which shows that people are increasingly recognizing the need for a responsible as well as sustainable AI-based transformation. According to the analysis, organisational resilience, which received a score of 4.05, and stakeholder trust, which received a score of 4.10, also garnered high ratings. This illustrates that trustworthy AI enhances organisational resilience and stakeholder trust. Human-Centric Innovation attained an average score of 3.96 showing an agreement moderate to high on the concept of industry 5.0 which aims at enhancing the relationship between human and others.

**Table 2: Correlation Analysis**

Variables	Trustworthy AI	Organizational Resilience	Sustainable Digital Transformation
Trustworthy AI	1.000	0.742**	0.781**
Organizational Resilience	0.742**	1.000	0.715**
Sustainable Digital Transformation	0.781**	0.715**	1.000

The level of association has been found out through correlation analyses results of Trustworthy AI and Organizational Resilience ( $r=0.742$ ,  $p<0.01$ ). Moreover, trustworthy AI is closely linked with sustainable digital transformation ( $r= 0.781$ ,  $p < 0.01$ ). As such, organizations today that build AI systems and technology that are transparent, accountable and explainable can successfully meet organizational resilience and digital transformation objectives. Similarly, sustainable digital transformation is significantly linked to organization resilience.

**Table 3: Multiple Regression Analysis**

**Dependent Variable: Sustainable Digital Transformation**

Predictor Variable	Beta Coefficient	t-value	p-value
Trustworthy AI	0.521	9.846	0.000
Organizational Resilience	0.347	6.412	0.000
Human-Centric Innovation	0.228	4.583	0.001

  

Model Summary	Value
R	0.824
R <sup>2</sup>	0.679
Adjusted R <sup>2</sup>	0.672
F-value	86.514
Significance	0.000

The regression results indicate that Trustworthy AIs significantly affect Sustainable Digital Transformation with a score of 0.521 with  $p\text{-value} < 0.001$ . Organizational resilience also has positive and significant effect ( $\beta=0.347$ ,  $p<0.001$ ).

Human-Centric Innovation has a significant positive impact on transformation outcomes ( $\beta = 0.228$ ,  $p < 0.01$ ). The model is significant as reflected by the F-value which indicates the regression model's suitability.

**Table 4: Hypothesis Testing**

Hypothesis	Statement	Statistical Result	p-value	Decision
H1	Trustworthy AI significantly influences Organizational Resilience.	$r = 0.742$	0.000	Accepted
H2	Trustworthy AI significantly influences Sustainable Digital Transformation.	$\beta = 0.521$	0.000	Accepted
H3	Trustworthy AI positively impacts Human-Centric Innovation and Stakeholder Trust.	$r = 0.698$	0.000	Accepted

The first hypothesis professes a link between Trustworthy AI and Organizational Resilience. H1 is accepted since the strongly positive correlation of  $r = 0.742$  and significant p-value indicate organizations that tend to embrace trustworthy AI practices are more resilient.

The second hypothesis evaluated Trustworthy AI's impact on Sustainable Digital Transformation. Regression analysis indicated that trustworthy AI has a significant positive influence, as suggested by the result ( $\beta = 0.521$ ,  $p < 0.001$ ), on sustainable digitalization. H2 is therefore accepted.

The third hypothesis (H3) examined the effect of Trustworthy A.I. on Human-Centric Innovation and Stakeholder Trust. The analysis reveals that the two variables are highly correlated as shown by a p-value of  $< 0.001$  and  $r = 0.698$ . So, the mutual implementation of transparent and ethical AI systems generates employee participation as well as stakeholder trust leading to collaborative.

### Discussion

A recent study shows that the corporate attitude towards trustworthy AI and digitalisation have undergone many changes. As per the findings, the trustworthy AI is fast evolving into a strategic enabler of organizational resilience and sustainable digital transformation in Industry 5.0. The results of descriptive analysis indicate that the respondents mostly strongly agreed towards adoption of trustworthy AI practices. It indicates that organizations have begun to integrate transparency, accountability, explainability, fairness, and security into AI-driven systems. On top of that, the results also show the shift from technology-centric digitalization to human-centric and value-driven digital transformation triggered by Industry 5.0.

According to the correlation analysis, the need for Trustworthy AI is becoming increasingly essential to tackle emerging and unpredictable disruptions in the future. It is also connected to organizational resilience. Moreover, it enables the organization to respond to, adapt to and recover from change. Also, it can foresee, answer, self-correct the disruption. Employees and managers will trust and depend more on AI's recommendations when they are explainable and from a trustworthy AI system. In addition, reliable AI improves the resilience of the organization.

The research also revealed a significant positive correlation between Trustworthy AI and Sustainable Digital Transformation. Therefore, it is shown that implementing AI properly doesn't just use the organizations to optimize their operations and processes; it also helps in achieving the long-term sustainability of the organizations. An organization that associates with and implements trustworthy AI increases the likelihood of sustainable digital transformation within the organization. The organization integrating trustworthy AI into its operations and processes is capable of achieving sustainable digital transformation due to the legal and ethical requirements involving technology and innovation.

The regression findings indicate that Sustainable Digital Transformation is strongly predicted by Trustworthy AI. This result indicates how trust is essential for the success of digital transformation initiatives. Having sophisticated technologies does not guarantee a successful transformation. AI systems must be trusted by these actors as reliable, precise, and consistent with the organization's values and objectives. When trust is present, staff are more prepared to embrace technological change, customers have greater faith in artificial intelligent (AI)-enabled services and organisational leaders can more confidently make signals-driven decisions.

An additional key finding was that Trustworthy AI would impact Human-Centric Innovation and Stakeholder Trust. Industry 5.0 emphasizes collaboration between humans and intelligent technologies rather than replacing human abilities. As per the breakthrough findings, trustworthy AI generates workplace ecosystems to augment creativity, innovation and problem-solving through

human-AI interaction. Moreover, for effective AI governance, stakeholder trust is very important. Organizations that show responsible AI practices may create goodwill with customers, employees, regulators and investors.

According to existing literature, trust appears to be very vital condition for AI adoption, which is what we found. For example, earlier research has suggested that transparency and explainability increase user acceptance of AI systems. It also reassures that the processes will not cause any undesired result. As previous studies suggest, this study indicates that a trustworthy AI could help in technology acceptance along with organizational resilience and sustainability.

The results are important managerial implications. Company uses the principles of trustworthy AI broadly over the AI lifecycle. Crucially, the trust of various stakeholders can be bolstered through investments in explainable models, ethical governance, data protection and continuous monitoring systems. Further, encouraging employees to participate in the implementation of AI can build trust and enhance the quality of algorithms.

According to the study, Trustworthy AI ensures resilient and sustainable organizations of Industry 5.0. The concepts of AI are applicable which everyone can relate and easily adapt. Similarly, organizations use a global method to look for innovation in human-centric domain. Trustworthy AI makes the working of organization easier.

### Conclusion

The findings reveal that Trustworthy Artificial Intelligence strengthens the organizational resilience and sustainable digital transformation in the world of Industry 5.0. AI systems exhibiting transparency, accountability, explainability, and fairness can enhance organisational outcomes positively, according to studies. Moreover, this research discovered a strong correlation between the results of Trustworthy AI, Resilience, and Digital Transformation. AI systems that demonstrate a high level of security in relation to privacy and data protection schemes can provide positive gains for stakeholders. Reliable AI technology helps businesses endure the threat of digital disruption while allowing employees to work with intelligent systems in human-centric innovation. It is important for organizations to ensure that their AI systems and processes must be designed to be resilient and sustainable as more organizations adopt intelligent technologies. Entities of Industry 5.0 engaged in digital transformation are likely to exploit the principles as part of their AI governance frameworks.

### Recommendations

Organizations should put in place a holistic framework for the governance of AI, with top management commitment to risk assessment enhancing transparency, explainability, fairness, accountability and data security throughout the AI life cycle. In addition, key actions are necessary for building trust in AI, including investment in explainable AI tools and standard auditing mechanisms, continuous staff training to enhance AI literacy, strengthened trust and confidence in AI-based and enabled decisions, encouragement for collaborative interaction between humans and AI, involvement of employees in the design, implementation, and evaluation of AI, establishment of standardized 'Trustworthy AI' guidelines and frameworks as part of digital transformation for sustainability initiatives by policymakers and industry leaders, etc.

## References

- [1] Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of sustainable enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.
- [2] Hilbert, M., & López, P. (2011). The world's technological capacity to store, communicate, and compute information. *Science*, 332(6025), 60–65.
- [3] O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *Academy of Management Perspectives*, 27(4), 324–338.
- [4] Huang, J., Seck, M. D., & Gheorghe, A. (2016). Towards trustworthy smart cyber-physical-social systems in the era of Internet of Things. In *Proceedings of the IEEE System of Systems Engineering Conference*.
- [5] Huang, J. (2017). Building intelligence in digital transformation. *SDPS Transactions on Integrated Design and Process Science*, 21(4), 1–4.
- [6] Vial, G. (2019). Understanding digital transformation: A review and research agenda. *Journal of Strategic Information Systems*, 28(2), 118–144.
- [7] European Commission. (2021). *Laying down harmonised rules on artificial intelligence (Artificial Intelligence Act)*. Brussels: European Union.
- [8] Huang, J., Beling, P., Freeman, L., & Zeng, Y. (2021). Trustworthy AI for digital engineering transformation. *SDPS Transactions on Integrated Design and Process Science*, 25(1), 1–7.
- [9] Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901.
- [10] European Commission. (2022). *Industry 5.0: Towards a sustainable, human-centric and resilient European industry*. Luxembourg: Publications Office of the European Union.
- [11] Marcucci, G., Antomarioni, S., Ciarapica, F. E., & Bevilacqua, M. (2022). The impact of Operations and IT-related Industry 4.0 technologies on organizational resilience. *Production Planning & Control*, 33(15), 1417–1431.
- [12] Huang, J. (2023). Digital engineering transformation with trustworthy AI towards Industry 4.0: Emerging paradigm shifts. *Journal of Integrated Design and Process Science*.
- [13] Díaz-Rodríguez, N., Del Ser, J., Coeckelbergh, M., López de Prado, M., Herrera-Viedma, E., & Herrera, F. (2023). Connecting the dots in trustworthy artificial intelligence: From AI principles, ethics, and key requirements to responsible AI systems and regulation. *Information Fusion*.
- [14] Ahmed, T., Karmaker, C. L., Nasir, S. B., Muktadir, M. A., & Paul, S. K. (2023). Modeling the artificial intelligence-based imperatives of Industry 5.0 towards resilient supply chains: A post-COVID-19 pandemic perspective. *Computers & Industrial Engineering*, 177, 109055.
- [15] Marinagi, C., Reklitis, P., Trivellas, P., & Sakas, D. (2023). The impact of Industry 4.0 technologies on key performance indicators for a resilient supply chain 4.0. *Sustainability*, 15(6), 5185.
- [16] Saeed, S., Altamimi, S. A., Alkayyal, N. A., Alshehri, E., & Alabbad, D. A. (2023). Digital transformation and cybersecurity challenges for business resilience: Issues and recommendations. *Sensors*, 23(15), 6666.

- [17] Leng, J., Zhong, Y., Lin, Z., Xu, K., Mourtzis, D., Zhou, X., & Shen, W. (2023). Towards resilience in Industry 5.0: A decentralized autonomous manufacturing paradigm. *Journal of Manufacturing Systems*, 71, 95–114.
- [18] Chamola, V., Hassija, V., Sulthana, A. R., Ghosh, D., Dhingra, D., & Sikdar, B. (2023). A review of trustworthy and explainable artificial intelligence. *IEEE Access*, 11, 78994–79015.
- [19] Artificial Intelligence High-Level Expert Group. (2019). *Ethics Guidelines for Trustworthy AI*. European Commission.
- [20] Lee, J., Ni, J., Singh, J., Jiang, B., Azamfar, M., & Feng, J. (2020). Intelligent maintenance systems and predictive manufacturing. *Journal of Manufacturing Science and Engineering*, 142(11), 110805.