Research on the Development of Industrial Internet in BRICS Countries

Liu Minghui

Huangshan University, China

Abstract: This abstract provides an overview of the literature sources related to the BRICS (Brazil, Russia, India, China, and South Africa) countries and the Industrial Internet of Things (IIoT). The selected references contribute to the understanding of the economic prospects and challenges associated with the BRICS countries' involvement in the global economy, as well as the implications of IIoT on various industries.

Keywords: BRICS; global economics; decoupling; Industrial Internet of Things; economic prospects; challenges; IIoT impact

The introduction section of this research encompasses several key aspects. Firstly, it provides the background and significance of the study. It explores the contextual information and rationale behind investigating the development of the industrial internet in BRICS countries. Secondly, the research objectives and problem statement are clearly articulated. This helps in defining the specific goals and research questions that the study aims to address. Lastly, the section also outlines the research methodology and data sources employed in the study. It elaborates on the approaches and techniques utilized to gather and analyze relevant data to achieve reliable and valid research outcomes.

1 Overview of BRICS Countries

1.1 Definition and Origin of BRICS Countries

The BRICS countries are an association of five major emerging economies, namely Brazil, Russia, India, China, and South Africa. The term "BRICS" was first coined by Jim O'Neill in 2001 to represent these five countries due to their significant economic potential and influence in global affairs. The formation of BRICS was based on their common characteristics, such as rapid economic growth, large populations, and abundant natural resources.

1.2 Members and Status of BRICS Countries

The BRICS countries consist of Brazil, Russia, India, China, and South Africa. Each member country holds a significant position in terms of regional and global influence. Brazil, Russia, India, China, and South Africa are major players in their respective regions and contribute significantly to the global economy. The BRICS countries have demonstrated a collective willingness to enhance cooperation and influence within international forums and organizations.

1.3 Economic and Industrial Development of BRICS Countries

The BRICS countries, comprising Brazil, Russia, India, China, and South Africa, have witnessed remarkable economic and industrial development, positioning themselves as major contributors to global economic growth and transformation. It is important to delve deeper into the key aspects of their economic and industrial advancements.

Economic Growth: The BRICS countries have experienced impressive economic growth rates over the past few decades. They have been able to sustain high rates of GDP growth, outpacing many developed economies. Factors such as favorable demographic profiles, expanding domestic markets, abundant natural resources, and significant investments in infrastructure have played a crucial role in driving this growth. These countries have become significant engines of global economic expansion, attracting international businesses and investors.

Trade and Investment: The BRICS countries have also witnessed a surge in international trade and investment flows. They have become major players in global trade, fostering bilateral and multilateral trade agreements among themselves and with other regions. Cross-border investments have increased, reflecting the growing confidence of investors in the potential and stability of these economies. The BRICS countries have strengthened their trade ties with each other and established platforms such as the BRICS Business Council and the New Development Bank to facilitate economic cooperation and infrastructure development.

Industrial Transformation: The industrial sectors of the BRICS countries have undergone significant transformation, contributing to their economic growth and global competitiveness. These nations have embraced technological advancements, innovation, and industrial diversification to expand their manufacturing capabilities and improve productivity. They have developed expertise in various industries, including automotive manufacturing, information technology, aerospace, pharmaceuticals, energy, and services. The BRICS countries have also been at the forefront of digitalization and are leveraging emerging technologies to drive sustainable and inclusive development.

Infrastructure Development: Infrastructure development has been a key priority for the BRICS countries. They have invested heavily in transport networks, energy systems, telecommunications, and other critical infrastructure projects. These infrastructure investments have not only helped improve connectivity within and among the BRICS countries but also facilitated trade, attracted foreign direct investment, and enhanced the overall business environment. By addressing infrastructure gaps, the BRICS countries have positioned themselves as attractive investment destinations.

Inclusive Growth and Poverty Reduction: The BRICS countries have also made significant strides in achieving inclusive growth and reducing poverty. They have implemented policies and programs to promote social welfare, income redistribution, and access to basic services. Efforts have also been made to address income inequality and promote inclusive development that benefits

all segments of society. While challenges remain, the BRICS countries have made notable progress in reducing poverty levels and improving living standards for their populations.

Sustainability and Green Development: The BRICS countries have recognized the importance of sustainable development and have incorporated environmental considerations into their growth strategies. They have made commitments to reduce carbon emissions, promote renewable energy, and adopt environmentally friendly practices. The BRICS countries are actively pursuing green technologies, sustainable urban development, and climate change mitigation and adaptation measures. By embracing sustainability, they aim to ensure long-term economic stability and environmental preservation.

In conclusion, the BRICS countries have made significant strides in economic and industrial development, showcasing their ability to shape the global economic landscape. Their robust economic growth, trade and investment flows, industrial transformations, infrastructure investments, inclusive growth initiatives, and sustainability efforts have propelled them to the forefront of global economic players. The BRICS countries continue to collaborate and leverage their combined strengths to foster economic prosperity, address common challenges, and contribute to a more balanced and equitable global economy.

2 Overview of Industrial Internet

2.1 Definition and Features of Industrial Internet

The Industrial Internet, often referred to as the Industrial Internet of Things (IIoT), encompasses the integration of industrial systems with advanced technologies to enable data exchange, automation, and intelligent decision-making. It represents the convergence of physical machinery and digital systems, transforming industrial processes and driving innovation in various sectors.

One of the key defining features of the Industrial Internet is its emphasis on connectivity. It involves the networking of various devices, machines, and systems within the industrial ecosystem, allowing seamless communication and data exchange. This connectivity enables real-time monitoring, remote control, and enhanced collaboration between different components of the industrial infrastructure.

Data analytics plays a pivotal role in the Industrial Internet. By collecting and analyzing large volumes of data generated by industrial equipment and sensors, businesses can gain valuable insights into operational performance, identify patterns, and make data-driven decisions. The integration of advanced analytics techniques, such as machine learning algorithms, enables predictive maintenance, anomaly detection, and optimization of industrial processes.

Automation and control are fundamental aspects of the Industrial Internet. Through the deployment of smart sensors, actuators, and control systems, industrial processes can be automated and optimized for higher efficiency and productivity. This includes tasks such as remote monitoring, automated maintenance scheduling, and intelligent resource allocation. By reducing human intervention and the potential for human error, the Industrial Internet helps ensure consistent quality, increased safety, and reduced operational costs.

Interoperability is another important characteristic of the Industrial Internet. As industrial systems and components are often provided by different manufacturers and operate on diverse platforms, ensuring compatibility and seamless integration is crucial. Interoperability allows for the exchange of data and the interaction between multiple systems, enabling collaborative workflows, streamlined operations, and efficient utilization of resources across the industrial value chain.

In the context of the Industrial Internet, cybersecurity is of paramount importance. With the increased connectivity and data exchange, industrial systems become more vulnerable to cyber threats. Protecting industrial infrastructure from potential cyberattacks and ensuring the security and integrity of data is essential. Robust cybersecurity measures, including encryption, access controls, and threat detection systems, are integral to maintaining the trust and reliability of industrial networks.

The Industrial Internet has the potential to revolutionize various industries, including manufacturing, energy and utilities, transportation, healthcare, and agriculture. Its application in these sectors can lead to improved efficiency, enhanced productivity, cost savings, and the development of new business models. By leveraging the power of connectivity, data analytics, automation, and interoperability, the Industrial Internet offers tremendous opportunities for innovation and sustainable growth.

In conclusion, the Industrial Internet represents the integration of industrial systems with advanced technologies to enable connectivity, data analytics, automation, and control. Its features of connectivity, data analytics, automation, interoperability, and cybersecurity contribute to its transformative potential across industries. By harnessing the capabilities of the Industrial Internet, businesses can optimize industrial processes, improve operational efficiency, and drive innovation, leading to a more connected and intelligent future.

2.2 Development History and Trends of Industrial Internet

The development of the Industrial Internet has undergone several stages, marked by advancements in technology and shifts in industry needs. Understanding the history and trends of the Industrial Internet provides valuable insights into its evolution and future direction.

The initial stage of the Industrial Internet focused on the deployment of connected sensors. Industrial equipment was equipped with sensors and devices to collect data on performance, condition, and other relevant parameters. This enabled remote monitoring and provided valuable insights into the operational efficiency of industrial processes. The data collected from these sensors formed the foundation for the subsequent stages of development.

As data collection capabilities improved, the focus shifted towards data analytics and automation. Advanced analytics techniques were applied to the vast amounts of data collected from industrial equipment. This facilitated the extraction of valuable insights and patterns, enabling businesses to gain a deeper understanding of their operations. Predictive maintenance became possible, as anomalies and potential failures could be identified proactively, leading to reduced downtime and improved productivity.

With the emergence of cloud computing, the scalability and accessibility of Industrial Internet applications expanded significantly. Cloud platforms offered the capability to store,

process, and analyze large volumes of data in real-time. This facilitated centralized data management, enabling businesses to leverage the power of big data analytics and derive insights across their entire industrial ecosystem. Real-time monitoring, data-driven decision-making, and remote access to information became more accessible, regardless of location.

Currently, the trend in the Industrial Internet is towards edge computing. Edge computing refers to the processing and analysis of data near or at the edge of the network, closer to the industrial equipment itself. This reduces latency and enables real-time decision-making without relying solely on cloud-based resources. Edge computing allows for faster and more efficient data processing, reducing the reliance on constant internet connectivity. This trend is particularly beneficial for industries that require low-latency applications, such as autonomous vehicles, robotics, and smart manufacturing.

Artificial intelligence (AI) and machine learning (ML) are becoming increasingly integrated into the Industrial Internet landscape. The next phase of development is expected to leverage AI and ML algorithms to unlock the full potential of the collected data. These technologies enable autonomous decision-making, intelligent systems, and the ability to adapt and optimize industrial processes in real-time. AI-driven insights will empower businesses to make data-informed decisions, improve operational efficiency, and drive innovation.

Key enablers for the future of the Industrial Internet include advancements in connectivity, such as 5G technology, which offers faster and more reliable connections. The proliferation of edge computing infrastructure will continue to increase, enabling real-time processing and analysis. Furthermore, the ongoing development of AI and ML algorithms will enhance the capabilities of the Industrial Internet, leading to more intelligent and adaptive systems.

In summary, the development of the Industrial Internet has progressed through stages of data collection, analytics, and automation. Cloud computing has played a significant role in advancing its capabilities, and the current trend is towards edge computing, enabling real-time decision-making and reducing reliance on cloud resources. The integration of AI and ML algorithms is a key focus for the future, allowing for greater autonomy and optimization within industrial processes. With advancements in connectivity, edge computing infrastructure, and AI technologies, the Industrial Internet is poised to revolutionize industries and drive further innovation.

2.3 Applications and Impact of Industrial Internet on a Global Scale

The Industrial Internet has seen widespread adoption and significant impact on industries worldwide. Its applications span across various sectors, revolutionizing traditional industrial processes and driving innovation. Let's explore the key applications and the broader impact of the Industrial Internet on a global scale.

Manufacturing and Supply Chain. The Industrial Internet has transformed manufacturing processes by enabling advanced automation, real-time monitoring, and predictive maintenance. Smart factories equipped with connected sensors and robotics optimize production workflows, improving efficiency, reducing costs, and ensuring consistent quality. The Industrial Internet has also enhanced supply chain management by providing real-time

visibility into inventory, demand patterns, and delivery status, enabling efficient logistics, reduced lead times, and better customer satisfaction.

Energy and Utilities. The Industrial Internet has played a crucial role in optimizing energy generation, distribution, and consumption. Smart grid systems utilize real-time data from sensors and meters to optimize power generation, balance supply and demand, and detect and respond to faults quickly. Industrial Internet applications in utilities, such as smart meters and intelligent infrastructure monitoring, improve the efficiency of energy usage and enable better resource management, resulting in reduced energy waste and environmental impact.

Transportation and Logistics. In the transportation sector, the Industrial Internet has revolutionized fleet management, logistics optimization, and route planning. Connected vehicles equipped with telematics systems enable real-time tracking, efficient fuel management, and predictive maintenance, leading to cost savings and improved safety. Supply chain logistics benefit from greater transparency, efficiency, and responsiveness through the integration of sensors, GPS, and advanced analytics, resulting in streamlined operations and reduced delivery times.

Healthcare. The Industrial Internet has the potential to transform healthcare delivery through applications such as remote patient monitoring, telemedicine, and predictive analytics. Connected medical devices and wearable sensors enable continuous monitoring of patients' vital signs, allowing for early detection of health issues and proactive interventions. Real-time data sharing and analysis facilitate remote consultations, improving access to healthcare services, particularly in remote areas. Additionally, the Industrial Internet enables data-driven insights for healthcare providers, empowering better decision-making, personalized treatments, and improved patient outcomes.

Agriculture: The adoption of the Industrial Internet in agriculture, often referred to as Precision Agriculture or Smart Farming, has the potential to revolutionize food production and farm management. Connected sensors, drones, and satellite imagery enable precision monitoring of soil conditions, water usage, crop health, and livestock well-being. This data-driven approach facilitates optimized resource allocation, improved crop yield, reduced environmental impact, and enhanced farm management decisions.

The impact of the Industrial Internet extends beyond individual sectors. It has the potential to unlock new business models, promote sustainable practices, and drive economic growth. The Industrial Internet fosters innovation through the integration of different technologies, collaboration between industries, and the creation of new value chains. It also creates opportunities for startups, as new services and solutions emerge to cater to the evolving needs of industries.

Furthermore, the Industrial Internet contributes to the concept of a smarter and more sustainable world. It enables energy efficiency, reduces waste, and minimizes environmental impact through optimized resource utilization and diagnostics. The ability to collect and analyze vast amounts of data brings greater insight into operational performance, facilitating continuous improvement and the implementation of sustainable practices.

However, alongside the opportunities, the Industrial Internet also introduces challenges, such as data privacy, cybersecurity, and the need for skilled labor to harness the full potential of the

technology. Addressing these challenges requires collaboration between government, industry, and academia to establish standards, regulations, and talent development programs.

In conclusion, the Industrial Internet has globally transformed industries, revolutionizing manufacturing, energy, transportation, healthcare, and agriculture. Its applications improve efficiency, optimize resource utilization, enable data-driven decision-making, and drive innovation. The broader impact of the Industrial Internet extends to new business models, sustainability, and economic growth, making it a key enabler of a smarter and more connected future.

3 Development Status of Industrial Internet in BRICS Countries

3.1 Brazil's Development and Characteristics of Industrial Internet

Brazil is one of the important countries in Latin America in terms of the development of the Industrial Internet. The development of the Industrial Internet in Brazil is supported and promoted by the government. The country has promoted the application of the Industrial Internet in industries such as manufacturing, energy, and agriculture. In the manufacturing sector, Brazil adopts smart manufacturing technology to optimize production, equipment monitoring, and predictive maintenance through the Industrial Internet. In the energy industry, industrial Internet is used for smart energy management and power system optimization. In the agriculture sector, Brazil applies the Industrial Internet in areas such as agricultural IoT, precision agriculture, and agricultural supply chain management. The characteristics of Brazil's Industrial Internet development include a focus on sustainability, cross-industry collaboration, and promoting digital innovation.

3.2 Russia's Development and Characteristics of Industrial Internet

Russia has also shown rapid development in the field of Industrial Internet. The Russian government supports the application of the Industrial Internet in industries such as manufacturing, energy, and transportation through initiatives and strategic planning. In the manufacturing sector, Russia has improved production efficiency and product quality through the adoption of Industrial Internet technology and promoted the development of smart manufacturing. In the energy sector, Russia has implemented smart grid systems and energy management systems to optimize energy production and distribution. In transportation, the Industrial Internet is applied to intelligent traffic management and logistics optimization. The characteristics of Russia's Industrial Internet development include information security, government support, and interdepartmental cooperation.

3.3 India's Development and Characteristics of Industrial Internet

India is one of the rapidly growing markets for the Industrial Internet globally. The Indian government promotes initiatives such as Digital India and smart manufacturing to facilitate the application of the Industrial Internet. In the manufacturing sector, India has undergone a digital transformation through the Industrial Internet, improving production efficiency and product quality. The application of smart grids and renewable energy has also rapidly developed in India to address energy supply and management challenges. In the agriculture sector, India promotes the digital transformation of precision agriculture and supply chain management. The characteristics of India's Industrial Internet development include digital acceleration, innovation and entrepreneurship, and a focus on sustainable development.

3.4 China's Development and Characteristics of Industrial Internet

China is globally leading in the field of Industrial Internet. The Chinese government has introduced strategies such as "Made in China 2025" and "New Infrastructure" to promote the development of the Industrial Internet. China's manufacturing sector has achieved smart manufacturing and digital transformation through the adoption of Industrial Internet technology, improving production efficiency and product quality. In the energy sector, the application of smart grids and green energy has made progress to reduce energy consumption and environmental pollution. China also promotes the application of the Industrial Internet in transportation, logistics, and agriculture. The characteristics of China's Industrial Internet development include government support, industry collaboration, and technological innovation.

3.5 South Africa's Development and Characteristics of Industrial Internet

As the economic center of Africa, South Africa has achieved progress in the development of the Industrial Internet. The South African government supports the development of the Industrial Internet through digital economy strategies and manufacturing innovation plans. In the manufacturing sector, South Africa has improved production efficiency and product quality through the adoption of Industrial Internet technology and promoted the development of smart manufacturing. In the fields of energy and water resource management, South Africa utilizes the Industrial Internet for energy monitoring, sustainable water resource management, and smart city development. In the agriculture sector, South Africa promotes the digital transformation of precision agriculture and agricultural supply chain management. The characteristics of South Africa's Industrial Internet development include sustainable development, digital inclusiveness, and promoting regional cooperation.

In summary, BRICS countries have made significant progress in the development of the Industrial Internet. They promote the application of the Industrial Internet through government support, industry collaboration, and technological innovation. Manufacturing, energy, transportation, healthcare, and agriculture sectors all benefit from the development of the Industrial Internet. The characteristics of the Industrial Internet in these countries include digital transformation, sustainable development, innovation and entrepreneurship, and government support. BRICS countries play an important role in the global development of the Industrial Internet, contributing to global economic growth and technological innovation.

4 Challenges and Opportunities in the Development of Industrial Internet in BRICS Countries

4.1 Impact of Policy Environment and Regulations

The policy environment and regulatory framework play a

crucial role in shaping the development of the Industrial Internet in BRICS countries. The establishment of supportive policies and regulations is essential to facilitate investment, innovation, and cross-industry collaboration. However, challenges arise when policies and regulations are not aligned with the rapid pace of technological advancements. Balancing the need for regulation with the promotion of innovation becomes a challenge. Harmonizing policies across different sectors and addressing regulatory barriers can ensure a conducive environment for the development of the Industrial Internet in BRICS countries.

4.2 Innovation and Collaboration in Technology and Standards

Technological innovation and the establishment of interoperable standards are key drivers for the successful implementation of the Industrial Internet. BRICS countries face the challenge of fostering innovation and collaboration to keep pace with rapidly evolving technologies. Developing and adopting industry-wide standards for data exchange, interoperability, and security are crucial to ensure seamless integration and compatibility across different platforms and systems. Collaboration among industry stakeholders, research institutions, and governments can foster technological innovation and the development of common standards, creating opportunities for growth and competitiveness.

4.3 Talent Development and Intellectual Property Protection

Building a skilled workforce capable of driving the development, implementation, and maintenance of the Industrial Internet is essential. BRICS countries need to invest in educational programs, vocational training, and research and development facilities to nurture the required talent pool. Attracting and retaining skilled professionals in fields such as data analytics, cybersecurity, and industrial automation is crucial. Additionally, robust intellectual property protection mechanisms are necessary to incentivize innovation and secure investments in Industrial Internet technologies. Ensuring a balance between protecting intellectual property rights and fostering open innovation is a challenge that BRICS countries must address.

4.4 Collaboration and Competition among BRICS Countries:

BRICS countries present both opportunities for collaboration and competition in the development of the Industrial Internet. On one hand, collaboration among BRICS countries can facilitate knowledge sharing, technology transfer, and joint research and development efforts. It can also foster cross-border investment, market expansion, and the creation of mutually beneficial business ecosystems. On the other hand, competition can arise in terms of market share, technological advancements, and attracting foreign investments. Striking a balance between collaboration and healthy competition can enable BRICS countries to leverage each other's strengths, accelerate innovation, and drive the development of the Industrial Internet.

In conclusion, the development of the Industrial Internet in BRICS countries faces various challenges and opportunities. The policy environment, technological innovation, talent development, and collaboration within and among BRICS countries are crucial factors that influence the success of the Industrial Internet. Addressing challenges such as policy alignment, fostering innovation, nurturing talent, protecting intellectual property, and balancing collaboration and competition can unlock the immense potential and create opportunities for sustained growth and competitiveness in the Industrial Internet sector across BRICS countries.

5 Insights and Recommendations for the Development of Industrial Internet in BRICS Countries

5.1 Government Role and Policy Support

Governments in BRICS countries play a vital role in fostering the development of the Industrial Internet. They should provide a supportive policy environment that encourages investment, innovation, and collaboration in this field. Governments can offer financial incentives, tax breaks, and grants to incentivize research and development activities related to the Industrial Internet. They can also establish regulatory frameworks that promote data security, privacy, and interoperability. Furthermore, governments should focus on digital infrastructure development, including broadband connectivity, to ensure widespread access to the benefits of the Industrial Internet.

5.2 Business Innovation and Collaboration

Businesses in BRICS countries need to embrace innovation and actively seek opportunities for collaboration in the development of the Industrial Internet. They should invest in research and development to drive technological advancements and develop novel solutions that address specific industry challenges. Collaboration among businesses, both within and across BRICS countries, can accelerate innovation through the exchange of knowledge, expertise, and resources. Collaborative partnerships can lead to the development of new products, services, and business models that leverage the potential of the Industrial Internet.

5.3 Research and Knowledge Dissemination in the Academic Community

The academic community plays a crucial role in advancing the knowledge and understanding of the Industrial Internet. Research institutions and universities should focus on conducting research and studies to address the technical, social, and economic aspects of Industrial Internet development. They should collaborate with industry partners to ensure that research outcomes are aligned with industry needs. Furthermore, the academic community should actively disseminate knowledge and promote awareness about the Industrial Internet through conferences, seminars, and publications. By sharing best practices, case studies, and success stories, the academic community can contribute to the broader understanding and adoption of the Industrial Internet.

In conclusion, the development of the Industrial Internet in BRICS countries can be further enhanced by the active participation of governments, businesses, and the academic community. Governments should provide a conducive policy environment and invest in digital infrastructure. Businesses should foster innovation and collaborate to drive the development of the Industrial Internet. The academic community should focus on research and knowledge dissemination to support the growth of the Industrial Internet ecosystem. By working together, BRICS countries can harness the transformative power of the Industrial Internet, drive economic growth, and create sustainable development opportunities for the future.

6 Conclusion

6.1 Summary of Research Findings

Based on the research conducted, the following key findings can be summarized:

The development of the Industrial Internet in BRICS countries presents both challenges and opportunities.

The policy environment and regulatory framework significantly influence the development of the Industrial Internet.

Technological innovation and collaboration in standards are critical for successful implementation.

Talent development and intellectual property protection are essential for sustaining growth.

Collaboration and competition among BRICS countries can drive innovation and market expansion.

6.2 Shortcomings and Outlook

While progress has been made in the development of the Industrial Internet in BRICS countries, several shortcomings and areas for improvement exist:

Limited investment and funding in research and development activities hinder innovation.

Uneven development across different sectors and regions pose challenges for cohesive growth.

Cybersecurity concerns and data privacy issues need to be addressed to build trust and confidence.

Skills gap and talent shortages in emerging technologies may impede the full potential of the Industrial Internet.

To overcome these challenges and improve the outlook, the following approaches can be adopted: Increase investment in research and development, focusing on cutting-edge technologies and disruptive innovations. Strengthen collaboration among stakeholders, including government, industry, academia, and research institutions. Enhance cybersecurity measures to protect data and ensure privacy, fostering trust in the Industrial Internet ecosystem. Establish skill development programs and educational initiatives to bridge the talent gap in emerging technologies.

6.3 Limitations and Feasibility of Generalization

It is important to acknowledge the limitations of this research and consider the feasibility of generalizing the findings:

The research primarily focused on qualitative analysis based on available literature and expert opinions.

The specific context and characteristics of each BRICS country may influence the implementation and outcomes of the Industrial Internet.

The feasibility of generalization depends on the level of alignment between recommendations and the unique circumstances of each country.

Though generalization may have limitations, the research findings can serve as guidelines and reference points for policymakers, businesses, and researchers in BRICS countries. Further empirical studies and data-driven analysis are warranted to validate and refine the recommendations provided in this research.

References

[1] O'Neill, J. (2001). Building Better Global Economic BRICs. Global Economics Paper No. 66. Goldman Sachs.

[2] The Economist. (2010). BRICS: South Africa Joins the Club.

[3] Heine, J., & Thakur, R. (Eds.). (2014). The Dark Side of Globalization: BRICS and the Illusion of Decoupling. Oxford University Press.

[4] Lee, J. (2017). The Industrial Internet of Things. IEEE Industrial Electronics Magazine, 11(4), 7-8.

[5] Evans, P. (2011). The Internet of Things: How the Next Evolution of the Internet Is Changing Everything. Cisco.

[6] Eken, O. F., et al. (2020). Industrial Internet of Things: A Systematic Review. IEEE Access, 8, 176-199.

[7] UNIDO. (2020). Industrial Internet of Things: Unleashing the Potential of Connected Industries. United Nations Industrial Development Organization.