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Digital Security in BRICS+ Countries

الأمن الرقمي في دول البريكس +

AFIA Kada*
Kada.afia@univ-mascara.dz
Mascara University
Research Unit: State and Society
ORCID: 0009-0000-4339-9275

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Abstract:

This study aims to assess the state of digital security in the BRICS group, including the 13 partner countries, based on their economic situation, most of which are emerging economies, as well as their digital status in the fields of knowledge, innovation, and artificial intelligence.

To achieve this, the study adopted an exploratory and analytical approach focusing on four key indicators: the Gross Domestic Product (GDP) of these countries for the year 2024 as an economic indicator, and the digital indicators (Global Knowledge Index 2023, Global Innovation Index 2024, and Artificial Intelligence Index 2024) in order to assess their global positioning in the field of digital security.

The results of the study revealed a correlation and direct relationship between the Gross Domestic Product (GDP) of countries and the Artificial Intelligence Index, which enhances digital security. For instance, countries like China, India, and Saudi Arabia exemplify this relationship. Meanwhile, the Knowledge and Innovation Indices serve as digital inputs that reflect the level of digital readiness of these nations.

Keys words: BRICS+; Innovation; Knowledge; GDP; AI

*AFIA Kada, E-mail: kada.afia@univ-mascara.dz

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ملخص:

تهدف هذه الدراسة إلى معرفة وضعية الأمن الرقمي في مجموعة البريكس، بما فيها الدول 13 الشريكة، انطلاقا من وضعها الاقتصادي الذي تشكل أغلبها اقتصاديات ناشئة، و كذا وضعيتها الرقمية في مجالات المعرفة، الإبتكار و الذكاء الاصطناعي.

من أجل ذلك، اعتمدت الدراسة على مقاربة استكشافية و تحليلية لأهم أربع مؤشرات و هي الناتج الداخلي الخام لهذه الدول لسنة 2024 كمؤشر اقتصادي، والمؤشرات الرقمية (مؤشر المعرفة العالمي 2023، مؤشر الإبتكار العالمي 2024 ومؤشر الذكاء الاصطناعي لعام 2024)، من أجل الوصول إلى تمركزها العالمي في مجال الأمن الرقمي.

توصلت نتائج الدراسة إلى أن هناك توافقية و علاقة طردية بين الناتج الداخلي الخام للدول و مؤشر الذكاء الاصطناعي، مما يعزز من الأمن الرقمي، و مثال ذلك الصين، الهند، المملكة العربية السعودية، بينما تشكل مؤشرات المعرفة و الابتكار كمدخلات رقمية تعكس مدى الجاهزية الرقمية لهذه الدول.

الكلمات المفتاحية: البريكس+، الإبتكار، المعرفة، الناتج الداخلي الخام، الذكاء الاصطناعي

Introduction:

The significance of digital security has increased over the years and has become a necessary part of the current society owing to the present age of rapid growth in various digital technologies and artificial intelligence.

1 As the governments and economies of the world begin adopting artificial intelligence for purposes such as making processes more efficient, secure, or even convenient, cyber defense becomes imperatively critical in protecting personal information, national interests as well as economic resources from potential attacks. With an apparent increase in the risks associated with the use of technology including cyber-attacks and other digital threats, digital security is paramount in protecting not only individuals but also organizations and hence helping develop confidence among users of these digital services which are becoming part and parcel of daily activities.2

BRICS+, which has Brazil, Russia, India, China, South Africa and Saudi Arabia, United Arab Emirates, Egypt, Ethiopia and Iran3 as its members, is a key bloc in the digital era that brings about new dynamics in the realm of digital security. With a mix of emerging and advanced economies, BRICS comprises countries with substantial capabilities in Cyber defense and AI expertise, notably China and India.

The technological infrastructures have been well - developed, and these nations have developed leadership in A.I innovation. Thus, they are positioning themselves as global influencers in both Cyber defense and the development of AI. Owing to their proactive approach toward digital threats,

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B.R.I.C.S countries can influence global digital security standards and practices to a great extent.4

Any proper understanding of B.R.I.C.S preparedness for achieving cybersecurity through certain global indicators would require an analysis of the knowledge Index, innovation index, and A.I index (GKI, 2023; GII, 2024; GAII, 2024). Carrying valuable information related to innovation capacity, digital literacy, and technological advancement of each country, and which constitute the very essential elements of any cybersecurity strategy. Through our study, we shall establish how these factors interplay to determine the state of preparedness by B.R.I.C.S nations in addressing the challenges of cybersecurity, and what that may imply for global cybersecurity in this era A.I and digital transformation.5

1- Literature Review

1-1- BRICS+: A Global View

B.R.I.C.S, it is coalition of five emerging economies, Brazil, Russia, India, China and South Africa, which together form a forceful alliance in promoting knowledge-based economic growth.6 Indeed, most B.R.I.C.S countries have assumed the lead in many areas: digitalization, artificial intelligence, and innovation, to name a few. For example, China and India are ranked among the world's top ten economies, with some of the best digital infrastructures and highly advanced A.I sectors to almost culminate at the pinnacle of global technology and economic influence. As drivers of the digital and knowledge economies, the B.R.I.CS+ countries are creating a model for other emerging nations on how knowledge-based industries can spur sustainable growth and international competitiveness.7

Recently, B.R.I.CS+ continued its chorus to break all previous records as the most expanded unity in recent history with 13 new partner countries in the alliance.8 The expansion meanwhile brought further considerable diversity and strategic strength. It introduced key countries such as Turkey, Algeria, Malaysia, and Nigeria with substantial regional perspective and significant resource base.

For a case in point, Turkey is strategically between Europe and Asia, and its economy is progressing in ways that drive a technological and energetic powerhouse. Algeria and Nigeria contribute the much-needed resources in energy; Malaysia, in turn, brings in its expertise in the field of digitalization with a high degree of development in the manufacturing sector.

For this reason, accession by the said countries enhances BRICS's potentials to impact international trends concerning the economic, technological, and geopolitical aspects including the so-called digital transformation and further impulses to sustainable development.9 In this regard, the support for growth and resilience has the starring role taken over by the B.R.I.CS Bank, otherwise known at the New Development Bank.10

The NDB is conceived to finance infrastructure and sustainable development projects in member and partner nations, thus providing an alternative source of funds against conventional financial
institutions. B.R.I.CS Bank is mainly focused on emergent markets and helps its member nations invest in such key areas as digital infrastructure, AI development, and knowledge-based economies by providing them with economic stability and technological advancement. This

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investment potential does not only strengthen the economic positions of the BRI B.R.I.CS+ CS countries but also encourages a more balanced and multipolar world economy.11

1-2- Digital Security: A Global Debate

Digital security has become the most alarming challenge for nations in this age of artificial intelligence, innovation, and rapid technological progress. As different governments, businesses, and individuals are continuing to depend on interconnected systems and digital platforms, the possibility of cyber threats and data breaches is growing by leaps and bounds.12

It now needs new polices and approaches toward protection against complex, ever-evolving cyber threats to sensitive information and the integrity of digital infrastructure, turning both into national priorities. Alongside rising levels of sophisticated attacks-from data theft to the actual sabotage of critical infrastructure-comes a corresponding requirement for resilient Data protection frameworks that can keep pace with rapid technological advance.13

That makes digital security in the A.I era even more daunting with each day passing, as A.I-powered systems and application permeate every nook and corner of critical sectors-finance, healthcare, and national defense.14 Though A.I comes forth with many advantages, such as predictive analytics and real-time threat detection, it likewise carries additional hazards if malicious actors seize such technologies. It enables cyber threat by automating and accelerating the pace of cyberattacks, which are going to breach systems much more easily and undetected, allowing the hackers to leverage any kind of vulnerability. The evolving digital landscape is calling for innovation in security measures that are AI-enhanced cybersecurity strategies to defend against these unique threats that arise from Artificial Intelligence in the first instance.15

Digital sovereignty has emerged as an essential aspect of Data protection, as nations seek to control their digital infrastructures and protect their citizens' data within their own borders. Countries are increasingly wary of foreign influence on their digital systems and are investing in technologies that allow them greater control and independence. This trend toward digital sovereignty reflects a growing awareness that Data protection is tied not only to technology but also to national autonomy and the protection of local industries. By fostering domestic tech innovation and minimizing reliance on foreign systems, countries aim to enhance their digital resilience while reinforcing their sovereignty.16

Innovation and technology play a dual role in addressing Data protection challenges, as they are both the source of new threats and the means to combat them. Emerging technologies, including blockchain, encryption, and A-I-powered security tools, provide advanced defenses against cyber threats. By investing in research and development, nations can create a robust ecosystem that supports Data protection while promoting economic growth through technological leadership. As Cyber-defense continues to evolve as a critical national priority, balancing technological innovation with effective safeguards will be key to navigating the complexities of the digital age.17

2-Methodology

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Our study relies on an exploratory analytical approach to various global indicators: the Global Knowledge Index 2023, the Global Innovation Index 2024, and the Artificial Intelligence Index 2024, focusing on B.R.I.CS+ + countries as well as B.RI.C.S partner countries. We will examine the economies of these nations to assess the impact on digital security. Table 01 below illustrates the economic and digital status of these countries.

Table 1. The economic and digital situation of the BRICS+

Countries	GKI (2023)	GII (2024)	GAII (2024)	GDP (2024)	
BRICS					
China	31	11	02	$18.53 Tn	
India	95	39	10	$3.94 Tn	
Russia	57	59	31	$2.06 Tn	
Brazil	75	50	30	$2.33 Tn	$27.23 Tn
South Africa	85	69	69	$373.23 Bn	
BRICS+					
Egypt	90	86	52	$347.59 Bn	
UAE	26	32	20	$527.80 Bn	
Iran	98	64	60	$464.18 Bn	$02.65 Tn
Ethiopia	128	130	83	$205.13 Bn	
KSA	40	47	14	$1.11	
PARTNER STATES					
Turkey	60	37	34	$1.11	
Indonesia	79	54	49	$1.48	
Algeria	111	115	80	$266.78 Bn	
Belarus	49	85		$69.05 Bn	
Cuba	/	/	/	/	
Bolivia	64	100		$49.33 Bn	
Malaysia	43	33	39	$445.52 Bn	$05.14 Tn
Uzbekistan	78	83		$97.96 Bn	
Kazakhstan	74	78		$296.74 Bn	
Thailand	52	41	43	$548.89 Bn	
Vietnam	71	44	58	$465.81 Bn	
Nigeria	124	113	73	$252.74 Bn	
Uganda	114	121		$56.31 Bn	
total					$35.02 Tn

Source: by research based on GKI, GII, GAII 2024

3-Results and Discussion

3-1 Analysis Of Table 01:

The data presented in Table 01 provides valuable insights into the global knowledge, innovation, and artificial intelligence capacities of BRICS countries and their partners.

3-1-1 Global Knowledge Index (GKI, 2023):

China leads among B.RI.C.S nations, ranked 31st globally, reflecting its significant investment in education and knowledge-driven initiatives. India follows at 95th, indicating substantial potential for improvement in its knowledge framework, despite its strong economic growth. Countries like Russia and Brazil show moderate rankings (57th and 75th, respectively), while South Africa's ranking of 85th suggests ongoing challenges in enhancing its knowledge economy. Among B.RI.C.S+ countries, Egypt and the United Arab Emirates show promising GKI rankings, reflecting their growing focus on knowledge-based economies.

3-1-2 Global Innovation Index (GII, 2024):

China again excels with an impressive 11th place, signifying its position as a global leader in innovation. India's ranking at 39th indicates it is gradually improving but still has a significant gap compared to China. Brazil, Russia, and South Africa rank lower in innovation, highlighting the need for these nations to foster stronger innovation ecosystems to compete globally. In the B.RI.C.S + group, the UAE stands out with a ranking of 32nd, showcasing its commitment to innovation-driven growth, while countries like Ethiopia lag behind at 130th.

3-1-3 Global Artificial Intelligence Index (GAII, 2024):

China’s remarkable 2nd place in the GAII underscores its strategic advancements in Artificial Intelligence technologies, contributing to its competitive edge in various sectors. India also performs well at 10th, indicating a robust Artificial Intelligence sector that is rapidly developing. Russia, Brazil, and South Africa show mixed results, with South Africa at 69th suggesting it is integrating Artificial Intelligence into its economy, but still requires significant investments to catch up. Among B.RI.C.S + countries, Egypt (52nd) and the UAE (20th)

demonstrate growing capabilities in Artificial Intelligence, while other nations show varying levels of readiness.

3-1-4 GDP Considerations:

China leads significantly in GDP at $18.53 trillion, highlighting its economic might and capacity to invest in knowledge, innovation, and Artificial Intelligence. India, despite its lower GDP of $3.94 trillion compared to China, shows strong potential for growth given its youthful population and rapid technological adoption. Countries like Brazil, Russia, and South Africa reflect diverse economic strengths but need to leverage their resources to enhance their GKI, GII, and GAII rankings. The inclusion of partner states like Turkey and Indonesia illustrates a broader economic landscape where emerging economies can benefit from collaboration and investment in knowledge-based industries.

Overall, this table illustrates the varying degrees of readiness and capability among B.RICS and partner countries in terms of knowledge, innovation, and artificial intelligence, which are critical for achieving Cyber-defense and sustainable economic growth in an increasingly interconnected world. The differences in rankings suggest opportunities for policy adjustments and investments that could enhance their competitive positions on the global stage

3-2 The Impact Of Digital And Economic Indicators On The Digital Security Of The BRICS Group

According to Table 1, the B.RICS countries, along with their partner nations, collectively account for over $35 trillion in gross domestic product (GDP). Of this amount, the BRI B.RICS countries alone contribute more than $27 trillion, demonstrating a substantial economic force. This combined output represents a powerful economic boost, underscoring the significant influence these nations hold in the global economy.

Digital indicators play a crucial role in enabling B.RICS countries to reach their substantial GDP figures, as highlighted in Table 1. These indicators reflect the adoption of knowledge-based economies, particularly among emerging nations within the B.RICS group. By focusing on digital infrastructure, innovation, and technological advancement, these countries are able to accelerate growth and productivity, thereby reinforcing their economic impact on a global scale. This reliance on digital transformation is a testament to their strategic shift toward knowledge economies.

The A Intelligent Systems I indicator stands out as the digital metric most closely aligned with the GDP performance of B.RICS+ countries, in comparison to other indicators. For

instance, China, as the world's second-largest economy with a GDP exceeding $18 trillion, also ranks second globally in Intelligent Systems development and innovation. This strong parallel between economic stature and Intelligent Systems capabilities is also seen in other leading economies within the B.RICS+ group. As these nations continue to advance economically, their rankings in A-I and technological growth consistently reflect their economic positions, making A-I a critical measure of their digital competitiveness.

As a result, achieving Cyber-defense becomes increasingly essential, aligning with the economic standing of these nations. The economic success of countries like China highlights the need for a secure digital environment to protect and sustain growth driven by AI and other advanced technologies. Therefore, a country's digital status should ideally match its economic position, ensuring that digital progress and security go hand in hand with economic development.

China's robust economic and digital status has increasingly become a source of concern for the European Union, prompting EU nations to take steps toward strengthening their digital sovereignty. In response, the EU has enacted stringent regulations aimed at both China and the United States, such as the Artificial Intelligence Act and the European Data Governance Act. These measures are designed to protect European digital infrastructure and secure data autonomy, reflecting a strategic push by the EU to limit external influence and assert control over its digital landscape in the face of rapid technological advancements from major global players.18

Conclusion:

Achieving Cyber-defense within BRI.CS nations requires a high level of preparedness, both economically and digitally. This study has demonstrated that a strong alignment between a country's GDP and its digital excellence—particularly in artificial intelligence, knowledge, and innovation—contributes significantly to its (D.S). Such integration not only fosters resilience but also ensures that these nations are equipped to handle the complexities of the global digital landscape.

China and India serve as pivotal models in this regard, showcasing how economic strength, combined with advanced A-I capabilities and innovative infrastructure, can lead to secure and competitive digital environments. Their progress sets a benchmark for other BRICS members and new partner countries, illustrating that investment in digital infrastructure can greatly enhance national security and competitiveness in the digital age.

As BRICS countries continue to advance, their digital and economic readiness poses a potential challenge even to the Group of Seven (G7) nations. By drawing on the experiences of China and India, other BRICS countries and emerging partners have an opportunity to strengthen

their positions, further solidifying their roles as key players on the global stage and pushing the boundaries of digital sovereignty and economic influence.

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