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Computing Power: The Cornerstone of the Digital Economy Development Race

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Computing power drives the engine of today's digital economy, transforming global economic activity through its unparalleled ability to process data efficiently. As computing capabilities have advanced, they've ushered in a new era of innovation, working in tandem with groundbreaking developments in the Internet, machine learning, and artificial intelligence. This technological synergy has not only reshaped business models and consumer behaviors but has also fundamentally altered our perception of services, information, and goods. The result is a digital landscape that continues to evolve, pushing the boundaries of what's possible in our interconnected world.

Digital Economy's Trinity: Data, Algorithms, and Computing Power

Three key components drive the modern digital economy: data, algorithms, and computing power. Data, once a mere by-product of digital engagements, has become a critical resource due to the rich information it contains. The technological breakthrough in algorithms (a set of rules which a computer follows to perform a task) and computing power (a computer's ability to perform tasks effectively) has enabled us to unlock the value of this data.

Computing platforms have revolutionized data management, seamlessly handling vast amounts of information. These systems, driven by intelligent algorithms and powered by robust computing infrastructure, unlock valuable insights across various domains. From consumer preferences to market trends and risk management, the extracted knowledge enhances decision-making and boosts productivity. This wealth of information has become indispensable for high-quality industrial and economic growth, solidifying computing power's position as a cornerstone of the digital economy.

Early Regulatory Focus on Data

Regulatory framework over data developed relatively early, driven by the concept of data sovereignty—the rights of states to assert control over data generated within their territory. To protect privacy and prevent misuse of sensitive information, states have imposed rules that require domestic data storage to ensure law compliance and retain the possible exercise of jurisdiction. Even though these restrictions may serve a legitimate purpose, they limit the free flow and use of data and thus slow the development of the digital economy.

The Geopolitics of Computing Power

Recently, regulatory restrictions have extended to computing power and related technologies. The pervasive impact of computing, both in civilian and military applications, has made its control and advancement a matter of national interest and national security. States' limitations on computing power often stem from complex geopolitical motivations. A vivid example of this can be seen in the recent U.S.-China rivalry, where both countries battle to gain the upper hand in computing technologies.

Leveraging extensive export regulations, the U.S. and its allies have successfully blocked rival nations from acquiring advanced computing power by restricting access to cutting-edge chips and their underlying technologies. The U.S. Congress has introduced legislation to limit foreign access to cloud computing services, aiming to prevent rival nations from circumventing export controls and obtaining advanced technologies.

While international tensions have heightened the focus on securing control over computing power and technologies, complete control is neither a sensible policy nor a feasible goal. Unlike the relative ease of controlling data within a country's borders, the internationally fragmented nature of computer and chip supply chains thwarts any attempt at comprehensive control over computing technologies and manufacturing.

Even dominant players like the United States lack control over the entire supply chain. While a self-sufficient domestic supply chain might be theoretically possible for a superpower, the economic inefficiency of such an undertaking makes it impractical unless geopolitical concerns significantly outweigh economic considerations. For most other countries, competing in an arms race for computing dominance is neither economically sound nor realistically achievable.

The Evolving Computing Ecosystem

While computing power is vital for success in the digital era, self-sufficiency is neither economically feasible nor efficient for most states. Therefore, a pragmatic approach is necessary. For national security and military applications, dedicated computing capabilities may be a strategic imperative, regardless of cost. However, over-regulation in less sensitive sectors is unwarranted. As computing power becomes increasingly critical in civilian and military spheres, and hegemons vie for technological supremacy, countries are bound to regulate the use of computing resources they oversee.

Drawing parallels with the “Data Free Flow with Trust (DFFT)” framework for data regulation, policymakers may adopt a similar stance on computing power, confining its sharing and technological exchange to a circle of trusted, aligned nations. If this scenario unfolds, it may likely catalyze a fundamental reorganization of the entire computing power industry, from supply chains to technological ecosystems.

The rise of the digital economy has profoundly altered the global economic terrain, influencing everything from global economic behaviors to resource allocation and market competition.

Every country that wishes to succeed in this next generation races to secure the necessary computing power to ensure the development of its digital economy. However, geopolitical rivalries and encroaching regulations are casting a shadow on the global sharing and utilization of this critical resource. As the computing power ecosystem undergoes a seismic shift, vigilant observation and analysis of its evolution and far-reaching consequences are imperative for nations and businesses alike.

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