

Information Network

Constructing China's independent knowledge system in the digital era

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Since last year, the Metaverse concept has incredibly become a hot topic from both industrial and societal perspectives pushed by various parties and factors. Meanwhile, the phenomenal growth of information technologies such as Web 3.0, DAO, StarLink, AIGC, etc., has also attracted great attention from both industry and academia. Although worth exploring, they are somewhat exacerbated by the hype of speculative capital. If we break free from switching hot topics and calm our minds down, we will find a problem that China often lacks its discourse system despite its arrival as a major tech power. We tend to “follow the crowd”. It was believed a few years ago that “as the United States closed the lighthouse, we have entered the ‘No Man’s Land’ of technological innovation”. Now it turns out that what is closed is not the lighthouse of technological innovation, but the “shortcut” of “copying from the western countries”.

China is a latecomer in information technology. The key to harnessing China's “latecomer's advantage” lies in getting rid of “path dependence”. We cannot blindly follow the steps of first movers regardless of whether the road ahead is in line with our domestic conditions, or is full of traps or even “minefields”. It is proved that we cannot achieve catch-up without innovating theories, pioneering new frontiers, and exploring new paths. For a “breakthrough” in the digital era, it is all about establishing an independent knowledge system and discourse system as well as setting up a “Chinese school” in the information field [1]. It is only through improving the quality of independent education with an independent knowledge system that we can thoroughly get rid of the “path dependence”, “knowledge dependence”, “method dependence” and “tool dependence” on Western information technologies that have lasted for more than half a century, thereby establishing self-confidence and global leadership in information technology.

In the digital era, China's independent knowledge system has five characteristics.

Firstly, pursue an independent path. In the 1990s, we invented China's own SPC exchange technology system in a radically new way. This not only broke the Western monopoly but also created our development path, saving us from patent lawsuits in the global market and from getting into the “stranglehold” dilemma. We can only avoid being controlled by others in the international arena by following our path and pace. When the Chinese path achieves practical success, it is naturally easy to be accepted as a global path.

Secondly, proceed from China's actual situation. China's promotion of the “broadband information demonstration network (3T Net)” and “tri-networks integration” in the late 1990s is an innovative attempt based on China's actual situation. In the sector of broadband mobile communication [2], China's achievement of theoretical breakthroughs on a path abandoned by other countries has enabled its mobile

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communication technology and industry to rank among the highest in the world. The development of any theory is based on objective reality [3], which starts from domestic reality and is aimed at solving development problems. Therefore, problems in China's digital transformation, such as the contradiction between an integrated support environment and diverse task demands, shall only be solved with China's original theories and technologies. Furthermore, it is necessary to clarify the differences between China's digital transformation and that of Western countries. China's digital transformation shall give full play to the advantages of latecomers, the new whole-nation system, and the domestic market.

Thirdly, coordinate security and development. Without the guarantee of security, there will be no sustainable development. In the construction of China's independent knowledge system, the "One Body, Two Wings" and "Two-wheel Drive" of cybersecurity and informatization must be highlighted. China's unique Endogenous Safety and Security technology system can solve the generalized functional safety problem or cyber resilience problem in an integrated way. Moreover, it can fundamentally solve a worldwide problem stemming from the uncoupling of critical infrastructures' cybersecurity and functional safety. With the wide application of AIGC and ChatGPT-like tools, their endogenous risks will inevitably lead to security and governance problems, which require matching security and governance theories and techniques.

Fourthly, absorb and learn from all outstanding achievements. An independent knowledge system is neither "shutting oneself up" nor "working behind closed doors". What we advocate is a system that is oriented towards building a community with a shared future for mankind and one that will win global consensus with a "China Plan" drawing on all advanced technologies in the world. For example, China's "multimodal network" [4] has successfully resolved the fundamental contradictions between "diverse networks and a unified infrastructure architecture" by integrating theory with practice, therefore providing a theoretical guarantee for higher standard opening up.

Lastly, apply it to an independent talent cultivation system. It is our priority to introduce China's independent knowledge system to the cause of talent cultivation. As the outstanding modern Chinese painter Qi Baishi said, "Paint my landscape with my pen and ink". Specifically, this includes placing greater emphasis on the spirit of originality and creativity in talent training plans, compiling textbooks and monographs that reflect China's innovative achievements, using China's own branded experimental environments in practical teaching, highlighting the ability to solve practical problems in quality evaluation, and creating a new training model of cultivating innovative talents through independent creative practices. It is only by disengaging ourselves from the backward cultural shackles of "following and imitating" that we can advocate innovation, break old paradigms [5], encourage pioneering, and promote the brave pursuit of uniqueness and originality. In this way, we can boost the development and growth of China's independent knowledge system, and meanwhile cultivate talented personnel with an innovative spirit, independent thinking, and scientific mindset to steadfastly solve China's digitalization problems.

China must seize the resulting opportunities of both scientific research paradigm shift and deep interdisciplinary integration to establish an independent knowledge system. To this end, we shall make unremitting efforts in four aspects. Firstly, promote paradigm innovation and establish a new theoretical and technological system in the field of digital technology. Secondly, promote interdisciplinary integration and establish a new system of disciplines and specialties that accords with China's reality. Thirdly, build consensus and establish a policy and standard system compatible with the new technology paradigm. Fourthly, focus on long-term development and establish an independent talent cultivation system.

As long as we start from China's reality, focus on our problems and dare to propose new theories, explore new fields, and explore new paths in the persistent pursuit of self-reliance and self-improvement, we can establish an independent knowledge system rather than an "imported" one, thereby gaining the initiative in technological innovation and strengthening the capacity for sustainable development.

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