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# Construction of Smart Library Based on the Agricultural Information from Metaverse Horizon

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**Abstract** Metaverse is a virtual world, but it is possible and even becomes a trend that metaverse interacts with the real world along with the sci-tech and social development. Smart library is a main direction of modern library development, from informatization to digitization and then intelligent-based, modernization of library has been improved qualitatively. Emergence of metaverse brings a brand-new horizon to the generation and application of agricultural information, this paper made primary explorations the requirements and action mechanism of agricultural information on the construction of smart library within the external constraint of metaverse.

**Key words** Agricultural information, Metaverse, Smart library, Dimension

## 1 Introduction

Since the day of its birth, library has borne the essential functions such as storing knowledge and information, data support, management support and policy-making support, while enlightenment of wisdom, and knowledge creation have brought library a supreme academic status, it is even entitled as "Paradise of Knowledge" and "Ivory Tower". With the development and application of computer, network technique, information technology, people in the age of knowledge explosion has always been faced with knowledge "bombing", and been unable to deal with all of these. Flat management tendency, emergence of learning society, generalization of social information resources and diversification of information dimensions make people screen the information they need in even simpler ways, which is a kind of "fast-track approach" to search information. Participatory or immersive experience makes the integration of virtual and real world an appeal of people for daily life, which lays a social foundation for the generation and development of metaverse. The proposal of "metaverse" manifests that human society has now entered a higher level and dimension of thinking.

## 2 Metaverse is a person's appeal for self-recognition

"Metaverse" as a word was created by Neal Stephenson in *Snow Crash* published in 1992, it described a massive virtual world where people can use science and technology such as digits to realize the vivosphere in the virtual world that maps and interacts with the real world. The idea swept around the world as soon

as it was known, even won wide attention from the circles such as science and technology, business, sociology, economics and management science, and arouse immersive "frenzy" in social life. It seems that all the society finds the new economic growth pint, which thereafter has triggered the development and application of new technologies such as extended reality (XR), blockchain, cloud computing, and digital twin, and brought a series of chain reactions. The authors thought that the "blowout" of metaverse rooted in human's thirst for "realizing" self-recognition, and since a carrier could meet this appeal, it would surely transform into realistic market value, and even social value, which certainly would also enhance the in-depth thinking on humanity value.

As Maslow's hierarchy of needs claims, the highest hierarchy of human needs is "self realization" and the realization of self worth depends on one's potentials, even without any limit. Each person has ideals or expectations, the fact is that there are always strict constraints in real life, and the definition standard for "success" socially is realistic, so power and capital become 2 basic elements for social existence and competitive strength. As a result, when people can hardly realize their appeals in social life, they turn to the virtual world where they can live as they wish, and such strong potential needs bring huge commercial value to virtual world, and also great challenges to human society in various dimensions such as economy, society, management, laws and morality.

## 3 Cognition of smart library

Smart library is and will be a hot topic in library development for the near future, all parties involved in the construction of smart library such as library, data supplier, interior decoration companies, information integrator immediately respond to this, make in-depth explorations in the "modernized" construction of smart library, from intelligent space to robot, from informatization to digitization, and mainly focus on technological development from the dimension of enriching service supply.

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What is a smart library? There are some common views: smart library is an application of Internet of Things (IoT), involving in the integration of library with internet of things, cloud computing, intelligent equipment *etc.*; smart library is a kind of digital experience, involving in the application of ICT technology, for example, such digital innovation services as big data platform, intelligent circulation service, service data wall of knowledge, smart bookshelf service, and 5G space network service. In general, smart library is the integrated cluster and coordinated management on the basis of information technology, the core principle is to serve readers. As for the metaverse, some scholars consider it as an aid to enhance the virtual space service.

There is a logic to be clarified first, *i. e.* who is the subject of "smart" of a smart library, library or reader? If the subject is library, more efforts should be devoted in the intelligence-based construction of library. Current construction of smart library system generally includes applied management system, books management system, RFID self-service borrowing and returning system, library archives system, portal website system, seat reservation system, digital resource system, electronic reading system, audio-visual leisure mutual aid system. The advanced experience lies in the elements of virtual reality technology: the vivid interactive device system built by comprehensively using CG, photoelectric imaging technology, sensing technique, computer simulation, and artificial intelligence, similar to "4D" movies with multiple perceptions such as vision, hearing, touch, smell and taste, which enable people to immerse in the virtual environment, and have interactive experience and feeling just like what they do in the real physical environment. These software and hardware constructions center on "library", which is a kind of supply-side reform, and the cognition of readers' needs is limited in resource construction, environment and staff service, *i. e.* it still remains in the service support model based on modern marketing philosophy. Smart libraries work as only the intelligent support for traditional libraries, based on the plain cognition of relatively uniform functions of man and library, respectively. For the latter, smart library will have the interactive and integrated development of "man and library". Library is a carrier, it uses diversified perceptions such as information (knowledge) to stimulate human brain and generate wisdom, and the environmental elements for the generation of brain wisdom, including physical elements such as air quality, light environment, sound environment, thermal environment, facility and equipment environment, layout and beauty, AI environment will be key external factors for a library realizing the interaction and connection between information and human brain.

## 4 Action mechanism of metaverse for smart library

**4.1 Metaverse solve the dimensional problems** If smart library is to solve the problems of "generation of intelligence", the generation is oriented at the problems, and aims at solving the problems that people encounter during the development. Because of the frustrations in life, many people turn to the virtual world to

realize their ideals and value, which may result in the unconventional knowledge system and operational rules, and all these things depend on the technological support brought by internet and artificial intelligence in the relatively higher development stage.

Metaverse is a concept first put forward in science fictions, but the similar conceptual system once was proposed by some scientific leaders such as Professor Qian Xuesen, and they confronted the perspectiveness of scientific and technological development and scientific exploration, *i. e.* the primary thinking on the basis of the realistic world "matter and consciousness". Metaverse is of both matter and consciousness, it is the unification of both. The realistic world is a 3D space, and four-dimensional when time is counted. The famous Nobel Prize winner Prigogine thought that the greatest achievement of Albert Einstein's general theory of relativity was that time-space is not unrelated with matter, time-space itself is generated by matter. However, the activity in time-space changes the time-space structure, the static connotation of time-space is replaced by a more dynamic connotation, the so-called "time effect of space". The world is not a world described by a single truth, science helps people build the bridge, and reconcile the opposite things, but not deny them. Therefore, metaverse is multi-dimensional, and the specific number of dimension is not the focus of discussion, what people have to re-recognize and review is that the needs it brings must be dimensional and diversified.

**4.2 Diversified outputs of metaverse** Metaverse is a virtual living space, its influence on realistic social life should be interactive, but not only a kind of technological input. Then what is the output of metaverse? In addition to needs on intelligent technology such as digits, which things in metaverse cannot be done in realistic world? In the realistic world, the knowledge structure system that people depends on to some extent can promote thinking, on the other side, it restrains people in the existing thinking mode, research paradigm and code of conducts. On the contrary, even if people bring some existing mode into the virtual world, different scenes and some brand-new affairs to some extent upend users' cognition, enforce them to think in the dimensions and ways more suitable for the virtual world, so as to solve the unknown problems in the virtual world. Such a challenge is likely to bring new cognition on the world and society, and enlightenment for solving problems in realistic world. In this sense, everyone's potential will be fully explored in the virtual world, or even the team's (some virtual team united for solving some common problems), so as to conquer difficulties, eliminate uncertain factors, rebuild "confidence", and the "confidence" is the most active psychological contribution of the virtual world to people in the realistic world.

People's understanding of virtual world remains in the level of technology, they use the sequence of realistic world to judge and restrain the sequence of virtual world, which is actually a natural "defect" because this brings a "known" restraint to the unknown field, and also a severe realistic problem: how to realize the interactive symbiosis and coordinated development of realistic world and virtual world? Particularly, owing to the realistic commercial

value and social value brought by the metaverse concept, it is the time to establish new rules for its development.

Thus, the output of metaverse is not only multi-dimensional and diversified, but more a dialectical thinking and even a subversive exploration, in which every person can be a producer of "knowledge", and even the participator in rule making.

**4.3 Smart library is a "bridge" connecting metaverse and reality** From the perspective of marketing, some production and consumption activities are simultaneous, for example, teachers in classroom are producing information and spreading knowledge, while students are listening and consuming. As for the experience of immersing in virtual world, users produce the feedback information for the virtual world during their virtual consumption, *i. e.* consumers have to generate their own thoughts and strategies during their challenge to the virtual world, even have to cooperate to build the new rules and hierarchies in this world. Therefore, smart library should play the role of not only virtual output, but also input of "virtual world problems and solutions", it collects information about the virtual world through information means and AI carriers and on this basis enhances the perception, exploration and research on the virtual world. Smart library is a place where wisdom "generates", and also an interactive space for readers absorbing knowledge and generating new ideas. Information flow here can turn into bidirectional output and input, library will become a collector of questions and solutions, and by building a related massive database system, it will be a window for people exploring future world, multipolar world or multi-dimensional world.

## 5 Application and production of agricultural information indicates the magnificent transformation of smart library

The primary intension and design concept of smart library construction will experience drastic changes along with the further exploration of the fourth-dimension space and above, the deepening of human cognition on humanity and intelligence-based development. Since then, library will turn from a marginalized traditional business with basic functions such as data collection and inquiry, to a research center with in-depth research and development of virtual world, brain function, and intelligence generation, on this basis forms an extremely complicated and gigantic "knowledge machine"—generation, application and development of knowledge. Through the interaction between real and virtual world, new research paths will be found, new knowledge system will be made as the valuable references for exploring real world.

Agricultural information is an extensive information system, agriculture in this context refers to the mega-agriculture, involving agriculture, rural areas and farmers. Agriculture, rural areas and peasants are integrated, so the integrated protection and systematic control of mountain, water, woods, field, grass and sand should be persisted to enhance the construction of beautiful China, to balance the industrial restructuring, pollution control, ecological conservation, adaptation to climate changes, coordinate to promote

carbon reduction, pollution reduction, expanding greening, and growth, and push forward the ecological superiority, resource saving and intensification, green and low-carbon development. Therefore, relative to the libraries with agricultural characteristics, agriculture information is an all-around discipline and profession system involving in natural science, social science and *etc.*

Library collects knowledge of different periods and dimensions involving agriculture, rural areas, peasants and relevant technologies, society, culture, laws, economy, management and history, so it can provides adequate resource support for learners and researches. Using virtual spaces such as metaverse can "visualize" and "virtually operate" agricultural information, facilitate the screening, exploration, sorting and development of the existing knowledge or information system. As for the technological application, virtual scenes can be simulated to "represent" the principles and operations, to enable learners connect theories with reality. The more valuable part is that production of agricultural information is to solve the problems by simulating in virtual scenes based on the cognition of existing information, then lead to systematic researches such as thinking, tracking, analyzing the problems, and countermeasures. The unaccomplished knowledge system can also be rethought or criticized in metaverse, to produce original knowledge and information system. The academic value of metaverse lies in enlightening, instructive, endeavouring, innovative and complete, it provides researches certain emotional inspirations using virtual scenes, and enlightenments through AI interaction, to ultimately "produce information". From the perspective of control theory, information in this context refers to useful data, problem-oriented, focusing on reality and perspectiveness of "agriculture, rural areas and peasants.

Metaverse is a brand-new perspective and idea that combines reality and virtuality, agricultural information taking realistic and future needs as the orientation, making innovations using virtual means in terms of information (knowledge) spreading and application, information collection, and perspective study.

## 6 Virtualization of agricultural information is a power of rebuilding the confidence

As the world population is over 8 billion, food security has aroused the worldwide attention. China is endeavoring to realize the modernization construction, to solve the modernization problems of agriculture, rural areas and peasants. The "guidelines" for rural revitalization: industrial prosperity, ecological livability, civilized rural customs, efficient governance, well-being life, involving in multiple fields and dimensions such as industrial development, ecological civilization, rural governance, and folk customs. Therefore, enhancing the research and prediction of future development helps reduce the risks and uncontrollability. An important approach of reducing the uncontrollability is to have adequate information for making decisions, virtual world can be used to simulate the future scenarios, and collect information by simula-

member martyrs, and inherit the spirit of patriotism<sup>[4]</sup>. Through living and studying in the countryside, students can feel the hardship of agricultural production and development, strengthen self-education, firm ideals and beliefs, and enhance their love and perseverance for their profession. In the third place, teachers can guide students to participate in China International College Students' "Internet + " Innovation and Entrepreneurship Competition, the National College Students' Innovation and Entrepreneurship Training Project, and the "Youth Red Dream Tour" project, so that students take advantage of their professional knowledge, combine red culture, independently go out of campus, explore and innovate in practice, accordingly Zunyi red culture leads the green development of rural areas and promotes rural revitalization.

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tion variables, enhance the prediction, help people to solve realistic problems in future. In addition to collecting, analyzing and supplying the information, the more profound value of library is to provide future information through virtual simulation, build a massive "future information research database" which make library a "development think tank research center" and will be an important value orientation of library. Only if a library has relatively complete information, historical inheritance and expansion, it will be a key link between reality and future (metaverse), which is also

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its irreplaceable uniqueness. In the age of "data", library will carry this responsibility, and rebuild people's confidence on future development.

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