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LINGNAN ANCIENT VILLAGES CULTURAL TOURISM HELPS RESIDENTS' HAPPINESS AND ITS OPTIMIZATION PATH RESEARCH

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Abstract: Traditional villages are the richest and most valuable heritage of Chinese civilization, which is a synthesis of tangible and intangible cultural and tourism heritage. In order to fully implement the strategy of rural revitalization and promote common prosperity, the shortcomings and weaknesses are in the villages, and the optimization space and development potential are also in the villages. This study takes Langtou Village in Guangzhou, a national-level traditional village, as an example, and explores the factors affecting residents' happiness and their optimization paths from the perspective of residents' happiness. This is an important initiative to explore the value and revitalization path of traditional ancient villages in Lingnan, as well as an important exploration of the path of integrating the traditional cultural and tourism resources of Lingnan into the ideological and political education of colleges and universities.
Keywords: Traditional ancient villages in Lingnan; Residents' well-being; Optimization path; Cultural and tourism resources; Case study

1 INTRODUCTION

Traditional Chinese ancient villages are a special public resource, a treasure of the Chinese nation's excellent traditional culture and tourism, a material carrier of human civilization and a valuable historical heritage, with high significance for protection[1]. Since the 18th CPC National Congress, General Secretary President Xi has pointed out that "it is better to have green water and green mountains than gold mountains and silver mountains" and "ancient villages should be effectively protected"[2]. At the same time, common prosperity is the essential requirement of socialism, the common expectation of the people, and the proper meaning of Chinese modernization. To fully implement the strategy of rural revitalization and promote common prosperity, the shortcomings and weaknesses are in the countryside, and the optimization space and development potential are also in the countryside. In the context of the new era, the countryside is the focus and difficulty of realizing common prosperity. Rural areas have rich and diversified natural scenery, unique cultural tourism and folklore resources with strong local characteristics, and the development of rural tourism has become an important force to promote the high-quality development of rural industry, promote common prosperity and meet the people's needs for a better life. It plays an important role in prospering the rural industry and economy, promoting the growth of residents' incomes, preserving and inheriting the rural culture and tourism, and enriching the lives of the residents, etc. The material and spiritual prosperity of the urban and rural residents is also a key factor. Spiritual affluence[3].

Rural tourism construction is in full swing around the world, want to stand out in the fierce competition, local governments and rural tourism developers need to dig deep into the local folk culture and tourism connotation, their own cultural and tourism characteristics as the main focus of rural tourism, to develop innovative tourism products. Characteristic rural tourism molding, nostalgia culture and tourism, exquisite lodging culture and tourism, as well as red tourism and other rural characteristics of tourism will become the new development trend.

From the comprehensive perspective of residents' happiness and the integration of culture and tourism, this study adopts the research method of questionnaire survey and in-depth interview to conduct field research on Langtou Village Ancient Village in Guangzhou, a national-level traditional ancient village. The study explores the impact of the development model of "tourism + culture and tourism" on the well-being of local residents, evaluates the well-being of Langtou Village residents, and proposes a path to optimize the well-being of Langtou Village residents. This case helps to analyze the path to the common prosperity and happiness of the residents of traditional ancient villages in the context of cultural and tourism integration, and has a good reference and demonstration effect on the improvement of the existing rural tourism development mode.

2 THEORETICAL FOUNDATIONS

The early theory of gaze originated from the mirror theory proposed by French psychologist Jaques Lacan. With the deepening of the research, it was then introduced by Early into tourism research as "tourism gaze" theory, and became an important theoretical analysis tool in tourism research. Tourism gaze as a product of combining tourism demands, motives and actions, tourists and hosts gaze at each other in both directions: as the local "I" hosts and outsiders "other". How the relationship between tourists should be dealt with and the interaction and gaming process between the host and the host are of great significance to the sustainable and healthy development of tourist destinations. Specifically tourists'

gaze reflects their perception of the tourism destination, affecting their tourism experience and tourism behavior, while local residents are also gazing at tourists and observing tourists in the reverse direction, which will form the residents' cognitive image of tourism and consciously and proactively develop local material and symbolic resources to develop tourism[4]. Host-guest interaction has developed into a special kind of tourism attraction, which can not only reflect the cultural and tourism interaction and communication between different individuals through host-guest interaction, but also further achieve the balance of supply and demand between tourist destinations and tourists.

The application of gaze theory in tourism mainly focuses on the research of tourist image and gazers' behavior, while there are fewer researches on the projection of tourist image by using gaze theory[5]. This study takes Langtou Village in Guangzhou City as an example to analyze the village tourism image projection and study its value and path construction, so that the local Langtou Village can adjust the tourism image shaping and projection of the village scenic spot in order to achieve better publicity effect and attract tourists' interest.

3 CASE SELECTION

3.1 Principles of Case Object Selection

This study launches a case study on the well-being of the residents of Langtou Village, Tanbu Town, Guangzhou City, Guangdong Province, chosen for the following three reasons. First, the principle of typicality. Relying on the local cultural and tourism construction, Langtou Village has realized its popularity, attracted some tourists to visit, and driven the local economic development to a certain extent, which makes the happiness of local residents change and has sample significance. Second, the feasibility of the study. The survey of residents' happiness in Langtou Village provides a good sample material for this study, which has a high degree of fit with the research theme, helps the literature and practice dialog, and continuously improves the theoretical model through repeated iterations of argumentation. Third, the accessibility and richness of data. The research team conducted in-depth research on the case sites and conducted in-depth interviews with the residents of the case sites to obtain more detailed information, which increases the authenticity and reliability of this study.

3.2 Basic Overview of the Case Site

Langtou Village was selected as one of the second batch of national traditional ancient villages in 2013 and was built in the 27th year of the reign of Emperor Zhizheng of the Yuan Dynasty. There are nearly 200 well-preserved green-brick buildings of the Ming and Qing dynasties, including a total of nearly 30 ancestral halls, study halls and academies, as well as three gun towers and gate towers. There are more than 20 ancient alleys in the village, as well as the historic Shengping Renrui Pai Fong and Qingyun Bridge. Langtou Village is famous for the variety of ancient buildings, the large scale of preserved buildings as well as the rich cultural connotations, and is by far one of the largest preserved ancient villages in Guangdong. Langtou Village is also characterized by a profound culture of cultivation and study. Langtou Village is a famous "scholar village" in the Pearl River Delta region, where villagers have always respected their teachers and advocated a "culture of cultivation and study", believing in the traditional value of "being a scholar in the fields in the morning and becoming a scholar in the sky in the evening". Langtou Village also has a profound culture of filial piety. In Langtou Village, the filial piety culture has been passed down for a long time. The village has preserved many folk activities related to the tradition of respecting the elderly, for example, every year at the Chung Yeung Festival, the village will celebrate the birthday of all the elderly aged 60 and above by holding a feast and distributing pork. Langtou Village also has a profound culture of integrity. In Langtou Village, there are stories about the integrity of the sage Huang Hao, "Tie Han Gong" and "Jin Mu Goose", and now there is a theme park of "Integrity Culture", which reminds the world of the integrity of the government and the people. In Langtou Village, there are folk art activities such as Lantern Festival, Lion Dance and Martial Arts, Cantonese Opera and so on, which have been passed down for hundreds of years. Most of the performances are centered on the Chinese New Year and Lantern Festival, which are not in a big form but have a lot of characteristics of the village, which is one of the characteristic cultures of the ancient village. Overview of the Long Valley Village area can be seen in Figure 1 below.
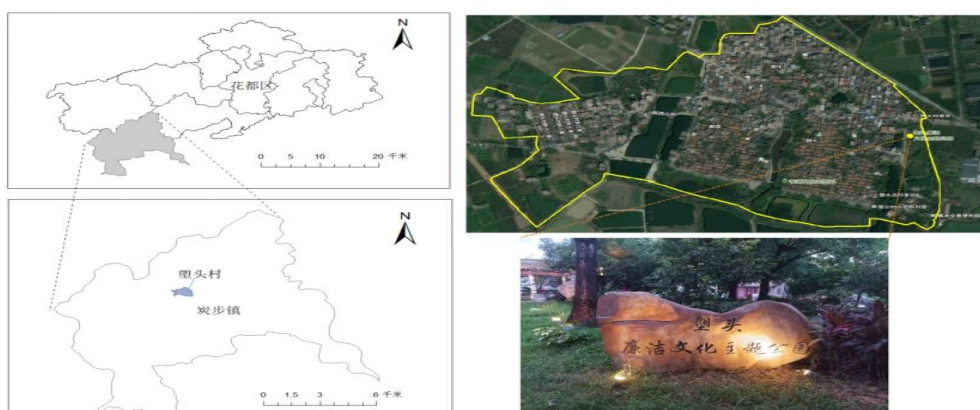
4 RESEARCH AND ANALYSIS

The field survey was conducted in Langtou Village, Guangzhou City during two time periods, July 10 to July 12, 2023 and January 10-12, 2024, and researched twenty-nine respondents. The interviewees included major groups such as tourism practitioners, residents, and village committees. The interviews were analyzed at five levels: personal information, perception of socio-economic development, perception of changes in social life, perception of changes in the human habitat, and perception of cultural and tourism construction[6-7]. The questionnaire data were organized, classified and analyzed as follows.

4.1 Overview of Basic Information on Residents

Of the 29 respondents, 17 were female and 12 were male. Most of the respondents were retired people, accounting for 24.14%, and students accounted for 20.69%, which is in line with the reality that most of the elderly and children in Langtou Village are left behind.

Among them, the education level of the respondents is mostly concentrated in university (college) and above, accounting for 31.03%. The proportion of residents with education level of elementary school and below is 27.59%, which is in line with the actual situation that most of the local residents are elderly people and students. This reflects that the education level of the majority of local residents is lower than medium, and they are not sensitive to the construction of cultural tourism and the issuance of related policies. The basic information of the respondents is shown in Table 1.

Table 1 Basic information of respondents

sports event	form	frequency	Percentage (%)
distinguishing between the sexes	male	12	41.38
	women	17	58.62
educational attainment	primary and below	8	27.59
	junior high school	5	17.24
	high school	7	24.14
	university and above	9	31.03
political profile	communist Party member	5	17.24
	communist Youth League	3	10.34
	democratic party	0	0
	the masses	21	72.41
careers	schoolchildren	6	20.69
	business personnel	3	10.34
	institutional personnel	5	17.24
	retirees	7	24.14
	freelancer	4	13.79
	(sth. or sb) else	4	13.79

4.2 Information Collection and Data Coding

Semi-structured interviews were conducted with 29 people, including Langtou Village tourism practitioners, village committee members and villagers, focusing on the tourism development situation of Langtou Village and the effectiveness of the construction of Langtou Village. The data collection and coding of the study are shown in Table 2.

Table 2 Collection and coding of research data

formality	data object	thrust	encodings
Semi-structured interviews	Heads of tourism enterprises (4)	Status of tourism development in Langtou Village	A1
	Local village committees (3)	Tourism development in Langtou Village	A2
	Local residents or employees (9)	Personal Development and Construction of Langtou Village	A3
Participatory observation	In-depth field experience observation, photography, etc.	Langtou Village and its Construction	B1
internal information	Information provided by local village committees and other authorities	Political, economic, social and other developments	C1
External information	Integrated media materials and periodical	Development effectiveness of Langtou	D1

literature, etc.	Village

5 ANALYSIS OF FACTORS INFLUENCING THE HAPPINESS OF RESIDENTS IN LANGTOU VILLAGE

5.1 Historical and Cultural Continuity

Historical culture refers to the past history and culture of a country or region[8]. The continuation of the historical culture of Langtou Village will enable the residents of Langtou Village to have a cultural heritage that is uniquely their own. It can also enhance the people's sense of pride in their own culture, which in turn can make the residents feel a sense of well-being. An interviewee mentioned, "Our place is situated in the north and facing the south, with very good feng shui and outstanding people! During the Ming and Qing dynasties, many people had high school entrance examinations, and there were many talented people. In the area, there were seven sons and five students, and two township scholars from father and son, and nearly 10 kilometer stones are still preserved, which are the best witnesses of the people of Langtou Village who have returned to their hometowns with their clothes on their backs, and at the same time, it also makes Langtou Village become a village of scholars that is known far and wide. As our ancestors worked as officials at the imperial court in the olden days, and they had made a great achievement, averting a catastrophe and saving a side of the people, the emperor gave five rewards to our ancestors!. After the construction of the culture of honesty and integrity, the popularity of our village has increased, and sometimes foreigners come to learn about our culture here! (A3-5)". Meanwhile, when interviewing the residents about their knowledge of the village's history and culture, some interviewees also mentioned, "There is a poem of Huang's recognition of relatives in our Langtou Village, and at the critical moment of fleeing from the disaster, the parents said that they recognized each other with this poem. This poem embodies the expectation of our ancestors for their offspring (A3-4)". The interviews revealed the pride that the interviewees gained from their own history and culture, contributing to the well-being of the residents.

5.2 Cultural Transmission of Genealogy

Genealogy has a long history and rich cultural connotation[9]. The inheritance of genealogy can promote the connection and cohesion between family members, and inherit the family virtues and family training education. Through the research of genealogy, you can also understand your own life and the relationship between family members, and enhance the sense of identity and belonging among each other. At the same time, genealogy, as an important historical record, can help family members trace the origins of their families and find their own family roots, fulfilling this desire to trace their roots. An interviewee mentioned, "All the male members of our Langtou Village are surnamed Wong. In this aspect of genealogy writing, it is some of the elders in the village who are continuously updating the genealogy, which is now stored in the museum at the village balcony outside the village (A3-8)". This shows the importance of the Huang genealogy to the residents and the enhancement of the residents' well-being brought to them by the genealogical heritage.

5.3 Cultural Continuity of Festivals

Traditional festivals are a kind of national customs and habits, as well as an important carrier for the transmission of history and culture. The formation of traditional festivals is a process of long-term accumulation and cohesion of the history and culture of a nation or country. The continuation of festival culture not only can make people in the festival to increase knowledge, be taught, but also help to show culture, promote virtue, cultivate sentiment, promote tradition. At the same time, traditional festivals condense the spirit and emotion of a nation, carry the cultural lineage and ideological essence of a nation, and are the spiritual bond of unity of a nation. Langtou Village has been continuing many traditional festivals, such as the Lantern Festival in the Lantern Festival and the Burning of Wo Lo in the Mid-Autumn Festival. An interviewee mentioned, "Around the 15th day of the first month of the year, our village holds the Lantern Festival, which is mainly composed of two parts, namely the lantern parade and the lantern throwing, and it is a very grand event with a very lively scene. At the Mid-Autumn Festival on August 15 every year, there will be a "Wo Lou burning" activity, which is also one of the more lively festivals on our side of Tanbu, that is, burning firewood in the Wo Lou, and then sprinkle salt when it burns vigorously, and then the fire goes up with a bang, which represents a red-hot fire (A3-2)". This represents the red-hot fire (A3- 2)". It can be seen that the continuation of the festival culture is of great significance to the residents, and therefore, it contributes to a certain extent to the enhancement of the residents' sense of well-being.

5.4 Economic and Social Development

The construction of cultural tourism in Langtou Village has improved the infrastructure inside the ancient village, such as road construction, water and electricity facilities. For the residents involved in the tourism activities in the ancient village, some employment opportunities have been created, which have increased the employment rate of local residents to a certain extent, effectively improving their living standard and further enhancing their sense of well-being. Some interviewees mentioned, "Employment opportunities have increased some positions for sanitation at the village balcony, maintenance of the Lotus Pond environment, etc., as well as some income from the lectures I sometimes give (A3-3)."

However, at the same time, some residents reflected that the construction of cultural tourism in Langtou Village could not boost the local economy, "the economy is not boosted at all, just a little bit of subsidy every year (A3-4)". "The cultural tourism construction cannot effectively drive the village economy (A3-5)". Therefore, it is evident that residents perceive economic and social development differently, and they value the economic benefits that are closely related to it.

5.5 Changes in Social Life

Destination popularity along with the development of tourism can enhance the sense of belonging and pride of local residents, which will make them experience a different kind of happiness[10]. The construction of cultural tourism in Langtou Village has increased the visibility of the area to a certain extent. "After the construction of LCS, the number of tourists has increased compared with the previous one, and during weekends and holidays, more people will come to visit than usual (A1-1)". It can be seen that when the construction of cultural tourism expands the popularity of Langtou Village and increases the number of tourists visiting the village, it can affect the local residents' own pride to a certain extent.

Dr. Bruce Headey of the University of Melbourne followed 60, 000 Germans for 25 years and found that lifestyle changes can have a long-lasting effect on a person's life satisfaction[11]. Unfortunately, however, most of the interviewees said that the CIVICUS did not change their lifestyle and had no impact on their normal life. Some interviewees said, "The cultural construction inside the village seldom has the village collective expropriating private space, and the arrival of tourists does not reduce our private space, nor does it affect us, all the cultural tourism construction has no impact on our life (A2-1)". It shows that the visits of foreign tourists do not affect the lifestyle of local residents, and there are no major fluctuations in the residents' well-being, both psychologically and behaviorally.

5.6 Habitat Change

The construction of the cultural tourism in Langtou Village has not only improved the local environment, but also improved the service facilities for local public life and enhanced the residents' sense of well-being. Some interviewees mentioned, "The construction of cultural tourism has not only not polluted our environment, but on the contrary, our environment has been improved after the construction because the government has spent money to hire some people to take care of the ponds and other places on a regular basis, which has led to the continuous improvement of the environment (A1-4)". It can be seen that the government's emphasis on the cultural and tourism construction in Langtou Village has enhanced the residents' sense of well-being to a certain extent. "There is a cultural room under construction in the theme park here, and there are also places for children to play, such as basketball court, table tennis, etc. The facilities over at the end of the village are more complete, and in addition to that, there are also some public facilities that are being improved (A3-7)". Through the interviews, it can be seen that the improvement of the environment by the cultural and tourism construction has really contributed to the improvement of the residents' sense of well-being.

6 CULTURAL TOURISM HELPS OPTIMIZE THE PATH OF RESIDENTS' WELL-BEING

6.1 Build a Benefit-Sharing Mechanism with the Help of Multiple Forces

Local governments should formulate and improve relevant plans and policies to promote the rational development and utilization of resources. This includes formulating land-use planning, resource management policies, environmental protection policies, etc., and clarifying the direction, methods and standards of resource development. In addition to this, diversified financing channels should be sought, such as the introduction of social capital and the launching of cooperative projects, in order to increase financial support and investment in resource development. By cooperating with enterprises or social sectors, we can jointly develop resources and share risks and benefits. Most importantly, publicity and education should be strengthened to raise the awareness and importance of resource development among villagers and decision-makers. Relevant training and lectures should be organized to raise villagers' awareness of the potential of resource development, encourage them to participate actively and give full play to their creative abilities, and drive them to create happiness with their hands.

6.2 Introducing the Principle of Democratic Participation and Improving the Rights and Interests Protection and Compensation Mechanism

Organize resident participation surveys and symposiums to respond effectively to residents' needs and expectations. At the same time, effective community participation mechanisms should be established to ensure that residents can fully participate in the planning process and form cooperative relationships with the Government and planning organizations. Establish a mechanism for protecting and compensating residents in cases where their rights and interests are affected by planning changes. Ensure that residents receive a fair share of the benefits of the planning process and provide the necessary safeguards and support.

6.3 Relying on the New Media Medium to Build Cultural Inheritance Paths

The transmission of culture begins with the strengthening of cultural education for local residents and young people. Through cultural courses and training programs, opportunities are provided for people to understand and learn about local cultures, traditions and values, and to stimulate their interest in and identification with culture. In response to the phenomenon of labor exodus, we can build local brand characteristics and create cultural enterprises to promote the development and innovation of local cultural industries. This will attract talents to stay in the local area and promote the prosperity and development of culture. In addition, relying on modern technology and social media platforms, establish a cultural exchange network. Through the network platform, the sharing and dissemination of cultural information to the outside world can be carried out to promote cultural exchanges and cooperation and reduce the impact of geographical distance on cultural transmission.

6.4 Enhance Resident Participation and Optimize Tourism Products and Services

Strengthening residents' sense of participation and responsibility and involving them in the development and management of the tourism industry. Conduct training and education programs to enhance residents' sense of service and professionalism, and increase their employment opportunities and income in the tourism industry. Transform single tourism products into diversified and high-quality tourism products to meet the needs of tourists. Attract the interest of more tourists while enhancing the competitiveness of the local tourism industry through the development of unique tourism resources and the introduction of special activities and experiences.

7 CONCLUSIONS

Rural tourism development needs to examine the elements of culture and resources, organically unify the theme image, industrial development and product supply, and aim to create a differentiated and distinctive rural cultural tourism development model[12]. This study takes the rural cultural tourism development of Langtou Village in Guangzhou, one of the national traditional ancient villages, as a case study, and explores the impact of the development model of "tourism + cultural tourism" on residents' happiness from the perspective of residents' happiness. Four optimization paths are proposed to assess the well-being of Langtou Village residents. This is a rare achievement in the existing research on ancient villages that focuses on cultural and tourism resources and industries to help villagers' happiness, and it has a good guiding effect on the research on ancient villages.

COMPETING INTERESTS

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REFERENCES

[1] Yu Xiaoyue. Research on the function of township government in the protection and development of traditional ancient villages. Jinan: Shandong Normal University, 2020.
[2] WANG Mengting, XU Yunzhi. Research on cultural tourism development of traditional villages under the background of rural revitalization--Taking the example of Wangjia 迤 ancient villages in Henan Province. Comparative Research on Cultural Innovation, 2023, 7(06): 128-131.
[3] WEI Xiaoliang, WANG Ying. Research on the development of rural tourism resources under the background of common wealth based on tourism gaze theory.Journal of Zhejiang Agriculture, 2023, 35(08): 19-29.
[4] Liu Mingyang, Wang Xinyi. Cultural Interpretation of the Drama "A Long Journey into the Night" from the Perspective of Gaze Theory. Art Education, 2024, (02): 171-174.
[5] Liu Yuxiao, Zhang Jianguo. A comparative study on the projection and perception of tourism image of village scenic spots based on gaze theory--Taking Tianmu Yuexiang, Hangzhou, Zhejiang as an example. Chongqing: Journal of Southwest University (Natural Science Edition), 2021, 43(05): 18-26.
[6] Zhou Danchu. Study on the development of rural tourism in Hao Tang Village of Xinyang City under the perspective of residents' perception. Xinyang: Xinyang Normal College, 2020.
[7] Zhao Min. Research on rural tourism development under the perspective of residents' perception. Hefei: Anhui Agricultural University, 2023.
[8] Cao Yidan, Hu Wanpeng. Integration and Innovation of the Movie "30, 000 Leagues in Chang'an" and History and Culture. Movie Literature, 2024, (12): 76-80.
[9] Xue Qianming, Huang Yuehao, Deng Qingwen, et al. Study on the revitalization and governance of traditional villages on the Loess Plateau in Longzhong under the concept of "Wen Yin Wu Bei": The case of Huang Jiazhuang Village in Yuchong County. Geography Research, 2024, 43(06): 1591-1610.
[10] Gao Yuan. Research on the external influencing factors of subjective well-being of residents in tourism

destinations--an empirical investigation based on Hainan International Tourism Island. Ecological Economy, 2012(11): 86-90.

[11] Headey B, Muffels R, Wagner GG. Long-Running German Panel Survey Shows That Personal and Economic Choices, Not Just Genes, Matter for Happiness. PNAS, 2010, 107(42): 17922-17926.

[12] Geng Songtao, Zhang Shenyang. Research on synergistic development of rural tourism and cultural industry in the context of rural revitalization. Journal of Nanjing Agricultural University (Social Science Edition), 2021, 21(02): 44-52.

THE USE OF SOCIAL MEDIA TO IMPROVE LEARNING SKILLS AMONG STUDENTS OF FEDERAL UNIVERSITY OYE-EKITI

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Abstract: The study investigated the use of Social media to improve learning skills among students: Case of Federal University Oye-Ekiti. Two research questions guided the study. The study adopted a descriptive research design and utilized a quantitative approach. The study population consisted of all the students from Federal University Oye-Ekiti. A purposive sampling technique was used to sample 63 educational foundation students from 400 level students enrolled for the 2021/2022 Academic Session. The data collection tool was a questionnaire titled "Social Media Platform Questionnaire for Improving Learning Skills (SMPQ)". Data collected was analyzed with the aid of mean and standard deviation and revealed that Facebook, YouTube, Instagram, blogs, WhatsApp, MySpace, and Google Plus are social media platforms used to improve learning skills among students. It was also revealed that many Federal University Oye-Ekiti students use social media to improve their learning skills to a greater extent. Elements such as Facebook, YouTube, Instagram, blogs, WhatsApp, MySpace, and Google Plus are widely used. It was recommended among other things that School authorities should prioritize educating students on the appropriate use of social media sites to prevent abuse.
Keywords: Use; Social media; Improve; Learning skills; University

1 INTRODUCTION

Social media has become an integral part of people's lives around the world in recent times. It's a massive revolution that has changed the lives of many students, especially the way they socialize and relate, and its use has skyrocketed in recent years [1]. The use of these media may have improved the learning skills of students, especially those at various universities, enabling them to be better informed and enlightened, to understand situations, to evaluate and use learning effectively, and to keep up with developments in the world. This shows the vitality of social media in our academic home and the university.

Universities are colleges and research institutions that award degrees in various subjects. It offers both undergraduate and postgraduate education [1]. A university is a place where advanced and in-depth study and research take place and degrees are awarded upon completion of a program, also known as post-secondary education. Here, the knowledge, skills, and abilities that students acquire during secondary education are enhanced through their conscious efforts. Here students develop creative thinking skills and prepare to become independent thinkers who can make their own decisions [2]. Alemu defines a university as an institution of higher education with advanced intellectual development in various disciplines and disciplines[3]. This is a university or place that has the authority to provide teaching and research facilities and to award undergraduate and postgraduate degrees.

The importance of a university education cannot be overemphasized because it is an important driving force in the country's construction and development [3]. This is achieved by providing students with professional, business, and technical skills that enable them to tackle key sectors of the country's economy, one of the goals of the National Education Policy [4]. The objectives of establishing university education in Nigeria under the National Education Policy are to contribute to national development through quality workforce education, to provide accessible, affordable, and quality learning opportunities that meet the needs and interests of all Nigerians, to increase the production of a skilled workforce linked to the labour market, and to encourage and support science, entrepreneurship and community development. College students could use social media as an endless source of learning. The tendency to use social media among university students seems to be increasing day by day, and many of them rely on social media for interaction and communication [5]. Students, especially university students, have many social media users as they bring many benefits to their studies. The above claims show that students cannot live without social media.

Social media has evolved into a category of online discourse where people create, bookmark, share, and connect with astonishing speed. It refers to the means of interaction between people creating, sharing, and exchanging learning and ideas within a virtual community or network. Boateng and Amankwaa defined social media as applications that enable conversations and interactions between users[6]. It is an online space that people use to connect, share, communicate, build, and nurture others for a variety of purposes. Social media are online platforms that allow people to build social networks and relationships with other people who share similar personal or professional interests, activities, backgrounds, and real-world connections. Social media is therefore the interaction between individuals who create and share learning and ideas within their networks [3]. However, social media relies on many electronic devices like tablets, iPads, laptops, and Internet-based technologies for connecting people. Thus, social media can be described as

technologies that facilitate social interaction, make collaboration possible, and enable deliberation among people at the global level.

According to Boyed and Ellison[7], social media is an Internet-based service that allows individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and traverse their list of connections and those made by others within the system. According to Ali, Iqbal, and Iqbal[8], social media is the collection of applications such as Facebook, Twitter, WhatsApp, LinkedIn, and YouTube, among others, that link people together as they share learning through social networking. As indicated by Junco, Heibergert and Loken [9], social media is referred to as a collection of Internet websites, services, and practices that support collaboration, community building, participation, and sharing. From the above, it can be deduced that social media is the platform that gives individuals the opportunity to interact, using two-way communication, such that it allows anyone who has an online account to share their opinions with other social media users.

Social media has become one of the prominent communication tools, particularly in the school community. Talaue, Alsaad, AlRushaidan, and AlHagail emphasized that social media platforms facilitate access to learning and educational materials[10]. Against this background, many students and teachers are using social media as a teaching and learning tool. Additionally, academic institutions are increasingly using social media platforms such as Facebook and LinkedIn to connect with current and potential students and provide educational content [11]. Social media platforms, therefore, enable students, teachers, and communities to engage and interact in educational and related activities [12]. With this in mind, many universities now maintain profiles and groups on social networking sites such as Facebook where students and faculty can interact, share resources, and express ideas. It seems that the use of social media is increasing among students. Facilitate virtual communities and virtual learning environments among users [12]. Students interact freely with community members in virtual communities. They can share learning and study experiences, research projects, and job opportunities which enhance their learning skills.

Learning can be defined as a relatively permanent change in behaviour resulting from reinforcement practice. According to Shaibu et al [13], learning can be defined as the change in behaviour that occurs at the end of the teacher-student interaction in the classroom. In other words, learning is the experience gained from interactions. As Daugherty said[14], learning is the transformation of an individual through some form of experience. This is sometimes referred to as the desired change in human behaviour. Therefore, learning is a change of behaviour. It is a process that involves changes in perception and behaviour.

According to Farrant[15], learning is the process by which we acquire and maintain attitudes, knowledge, understanding, skills, and abilities that cannot be attributed to inherited behavioural patterns or physical development. From the above definitions, it can be seen that learning includes the acquisition of desired knowledge, habits, skills, attitudes, and behavioural patterns through some form of experience or learning. It should be emphasized here that the concept of change is inherent in the concept of learning. If there is a behaviour change, it means that learning is taking place or has already taken place. The two main characteristics inherent in the human learning process are the positive and constant nature of behavioural changes. Learning is an active process in the sense that learners must participate in learning activities. This means that learning is a continuous exercise.

Learning is continuous in the sense that it takes place from cradle to death – before school, in school, out of school, and throughout life. Learning is a relatively permanent change in behaviour or performance resulting from practice, exposure, and experience; therefore, when a person's performance on a task changes as a result of practice, learning has already occurred in that person. We can practice reading, writing, singing, playing tennis, or driving [16]. The fact that learning has taken place can only be inferred from the individual's performance on a particular task. So, performance as a measure of learning can be subjectively and objectively observed while we cannot observe learning, we can conveniently observe changes in performance confirming that learning is directly related to a change in behaviour as measured by performance and at the same time, learning is related to conditions of practice or experience and this position caters to subtle changes in performance due to learning factors such as maturity, medication status, and fatigue. The use of social media for improving students' learning skills at Federal University Oye-Ekiti remains the focal point of this study.

According to Mohammed [17], exploitation is the process or act of using or benefiting from resources or services to accomplish a task or goal. Students must be able to explore or use the digital environment and social media to excel in learning and research and advance science. Coonan and Jane noted that student use of media can take the form of communicating or posting learning and materials via email[18], the World Wide Web, and other social media platforms. According to Alemu[3], social media use is the ability to use social media sites and platforms effectively and independently for your benefit. The use of social media in learning retrieval helps us to become more sophisticated, sophisticated, and confident researchers and lays the foundation for independent lifelong learning, thereby improving the learning skills of users (students) in the context of this research.

A bachelor is someone who studies at a university or other college. A student is a person who is formally engaged in learning especially those in higher institutions such as schools and universities. We have two types of students, undergraduate and graduate. "Student" refers specifically to a student seeking a first degree, a National Diploma (ND), or a National Education Certificate (NCE). According to Mole[19], an undergraduate is an undergraduate or professional student pursuing a bachelor's degree. The term "faculty" refers to a bachelor's degree. In practice, however, the importance of social media cannot be ignored if students are to fulfil their true purpose in the university environment. Social media offers many opportunities for students to virtually connect with other people, including family, friends/colleagues, teachers, partners, and even strangers.

Students have countless opportunities to engage with social media, which improves their learning skills. It allows them to virtually engage with the larger world around them. Students use social media in different ways based on their interests, community, friends, and family. The list of social media platforms used by students is constantly growing and changing. Some of the most popular platforms used by students today include Facebook, Instagram, WhatsApp, Twitter, MySpace, LinkedIn, Google Plus, and more. Social media is one of the most important sources of learning that keeps students up to date and provides easy access to a global online knowledge base. Students can use social media as an endless source of learning. Academics agree that the positive effects of social media on students seem to outweigh the negative effects [20]. In today's society, where education is the foundation of economic development, the importance of universities cannot be ignored when using social media.

In terms of research areas, preliminary observations revealed that Federal University Oye-Ekiti (FUOYE) students spend a lot of time on social media for various purposes, such as playing games, chatting with family and friends, and reading news from around the world. No matter how much time you invest in these activities, your efforts are jeopardized by a lack of knowledge on how to get the most out of your social media platform. Instead of using these media to improve learning skills, which are most important to their academic work, students are now using these media for irrelevant learning. Misuse of these websites denies students access to much academically relevant learning and undermines learning skills. Based on this premise, researchers aim to assess the use of social media to improve learning skills among students at Federal University Oye-Ekiti.

The use of social media in education generally and in universities, in particular, provides students with the ability to get more useful learning and connect with learning groups and other educational systems that make education convenient. Social network tools afford students and universities multiple opportunities to improve learning methods. Despite the benefits of social media on student learning and achievement concerning knowledge sharing, a study by Rithika and Sara underscores that even when social media is used for an educational purpose[21]; students incorporate the technology into their lives in a way that they use it to engage in irrelevant activities. Undergraduate students have diverted social media usage towards non-educational, unethical, and inappropriate actions and behaviours. It appears that some students, instead of taking advantage of the opportunities afforded by social media for learning purposes, have shifted their attention to using it for other reasons which have greatly affected their level of acquisition of learning skills which has enabled them to manipulate all kind of learning to their taste and for their academic enhancement and development [3]. There is, therefore, a need for undergraduates to use social media for enhanced learning skills among undergraduate students. Therefore, given this situation, this study investigated the use of social media to improve learning skills among students at Federal University Oye-Ekiti.

2 PURPOSE OF THE STUDY

The main purpose of this study is to assess the use of social media to improve learning skills among students: a case of Federal University Oye-Ekiti Specifically, the study:
i. identified the social media platforms used for improving their learning skills among undergraduate students of Federal University Oye-Ekiti.
ii. investigated the extent of use of social media by undergraduate students for improving their learning skills in Federal University Oye-Ekiti.

3 RESEARCH QUESTIONS

The following research questions guided the study:.
The following research questions were formulated to guide the study
i. What are the social media platforms used for improving learning skills among undergraduate students of Federal University Oye-Ekiti?
ii. To what extent do undergraduate students use the social media for improving learning skills in Federal University Oye-Ekiti?

4 METHODOLOGY

The research design of this study was a descriptive survey. This design is ideal because the problem under investigation is descriptive. The population under study consists of all the students at Federal University Oye-Ekiti. The choice of this population was informed by their poor exposure to the use of social media sites by their teachers teaching them in recent times.

The purposive and simple random sampling techniques were employed for sample selection for the study. Faculty of Education Students from Federal University Oye-Ekiti were purposively selected, because, the researcher had easy access to the respondents within the time frame for the study since the faculty is within the school. More so, the researcher was familiar with the students of the area as well as the departments therein, from which the sample size was determined based on the simplified formula proposed by Creswell [22]. Data were collected from 63 educational foundation students across the five departments in the Faculty of Education by using convenience techniques based on the availability and willingness to answer the questions.

The data collection tool is a questionnaire called "Social Media Platform Questionnaire for Improving Learning Skills (SMPQ)". SMPQ consists of two parts and allows you to get answers from your respondents. Section "A" asked for the

demographic characteristics of the respondents, while section "B" was further divided into research questions, each representing a research question. Cluster 1 has 9 elements and Cluster 2 also has 9 elements.

The SMPSQ was distributed to students in the study area by the researchers and research assistants to facilitate the distribution and collection of the questionnaire. The completed questionnaire was picked up by the researcher the next day. In analyzing the collected data, the researchers used frequency and simple percentages of demographic characteristics of the respondents. A four-point rating scale was used for responses and their associated values such as Frequently Used (FU) = 4, Rarely Used (RU) = 3, Occasionally Used (OU) = 2, and Never Used (NU) = 1. Responses were analyzed using mean and standard deviation. Rejection and acceptance criteria for the analysis were set at 2.50.

5 RESULTS AND DISCUSSION

Table 1 Mean Responses on the Social Media Platforms Used for Improving Learning Skills Among Undergraduate Students

S/N	ITEMS	FU	OU	RU	NU	Total	X	Decision
1	Facebook	24	19	9	11	63	2.88	Agreed
		96	57	18	11	182		
2	YouTube	26	21	10	6	63	3.06	Agreed
		104	63	20	6	193		
3	Instagram	22	19	11	11	63	2.82	Agreed
		88	57	22	11	178		
4	LinkedIn	4	3	25	31	63	1.68	Disagreed
		16	9	50	31	106		
5	Blogs	18	26	8	11	63	2.80	Agreed
		72	78	16	11	177		
6	WhatsApp	22	20	7	14	63	2.79	Agreed
		88	60	14	14	176		
7	Twitter	2	1	39	21	63	1.74	Disagreed
		8	3	78	21	110		
8	MySpace	21	21	12	9	63	2.85	Agreed
		84	63	24	9	180		
9	Google Plus	23	18	13	9	63	2.87	Agreed
		92	54	26	9	181		

Keys: FU= Frequently Used, **OU**= Occasionally Used, **RU**= Rarely Used, **NE**= Never Used
N_1= 63 Respondents

Table 1 shows the social media platforms used to improve the learning skills of students at Federal University Oye-Ekiti. Scores were 1, 2, 3, 5, 6, and 9, with mean ratings of 2.88, 3.06, 2.82, 2.80, 2.79, 2.85, and 2.87 above 2.50, indicating that respondents agreed to look at which social media platforms are being used to improve student's learning skills in their areas of study. However, points 4 and 7 have lower rates of 1.68 and 1.74, well below the cutoff of 2.50. This indicates that respondents do not agree on these points.

Table 2 Mean Responses on the Extent Undergraduate Students Use the Social Media for Improving Learning Skills

S/N	ITEMS	GE	%	LE	%	Total	Decision
10	Facebook	58	92.06	5	7.94	63	Great Extent
11	YouTube	55	87.30	8	12.69	63	Great Extent
12	Instagram	46	73.01	17	26.98	63	Great Extent
13	LinkedIn	8	12.69	55	87.30	63	Less Extent
14	Blogs	59	93.65	4	6.34	63	Great Extent
15	WhatsApp	58	92.06	5	7.98	63	Great Extent
16	Twitter	5	7.93	58	92.06	63	Less Extent
17	MySpace	49	77.77	14	22.22	63	Great Extent
18	Google Plus	50	79.36	13	20..63	63	Great Extent

Keys = GE; Great Extent, **LE;** Less Extent,

Respondents were asked to describe the extent to which undergraduates use social media to improve learning skills at Federal University Oye-Ekiti. According to this table, Facebook 92.06%, YouTube 87.30%, Instagram 73.01%, Blogs 93.65%, WhatsApp 92.06%, MySpace 77.77%, and Google Plus 79.36 are the most used. However, LinkedIn has a lower usage rate of 12.69% and Twitter 7.93%.

6 DISCUSSION OF THE FINDINGS

The study found that the social media platforms used to improve learning skills among Federal University Oye-Ekiti students are Facebook, YouTube, Instagram, blogs, WhatsApp, MySpace, and Google Plus. This is consistent with Baran`s findings that social media platforms such as YouTube[23], Facebook, Instagram, WhatsApp, MySpace, Google Plus, and blogs are prevalent and often used to improve learning skills among students. This result is similar to Whiting and Williams[24], who cited Facebook as the most popular social media platform for improving learning skills. Whiting and Williams reported that learning seekers around the world read her Facebook messages and posts about events and current affairs in their field[24]. Junco, Heiberger, and Loken found Facebook and other media as a way to engage students in learning[9]. It was corroborated by Rouse that Facebook is a popular and free social networking website that allows registered users to create profiles[25], upload photos and videos, send messages, and keep in touch with friends, family, and colleagues. The author added that through their Facebook page/account, librarians can draw users` attention to useful hidden treasures and further stated that among the social networking sites, Facebook appears to emerge as a winner predominantly because of its large number of members. Gunelius found out that Blogs in universities are used to communicate[26], as instructional resources, as collaborative tools, and as showcases for student projects and adds that the Blog provides a fast, efficient means of communication, posts class announcements for parents or provide schedule reminders for students and enhanced instructional resources, in which teachers can post tips, explanations, or samples to help students learn.

Research finding also shows how much Federal University Oye-Ekiti students use social media to improve their learning skills to a greater extent. Elements such as Facebook, YouTube, Instagram, blogs, WhatsApp, MySpace, and Google Plus are widely used. This finding is consistent with those of Hay[27], who conducted a similar study to determine the extent to which students use social media to improve learning skills. He found himself using Instagram, Facebook, blogs, WhatsApp, MySpace, and YouTube extensively. This finding is consistent with Krasnova, Veltri, Eling &Buxmann[28], who argued that the advent of social media has brought about significant changes in lifestyle and communication practices in society. The researchers further said that it is clear that not only Twitter but also social media platforms such as Facebook, Instagram, and WhatsApp are gaining popularity and permeating the lives of people around the world. In particular, social networks (SNSs) have become a popular platform for user interaction [29]. Hashim, Al-Sharqi, and Kutbi suggested that the presence of social media among more than 1.5 billion social media users worldwide motivates researchers to investigate why students use this kind of technology in their daily lives[30]. This is because addiction continues to rise worldwide, while young people in particular are the largest consumers of social media.

7 CONCLUSION

The study concludes that Facebook, YouTube, Instagram, blogs, WhatsApp, MySpace, and Google Plus are social media platforms used to improve learning skills among students. It was also concluded that improving students' learning skills and the perceived purposes of using social media to improve learning skills included assignments, assessments, ongoing assessments, and the use of social media for taking notes during class.

8 RECOMMENDATIONS

Based on the research findings, the following recommendations were made:
i. School authorities should prioritize educating students on the appropriate use of social media sites to prevent abuse.
ii. A skilled workforce should be recruited and strategically placed so that students can use social media appropriately to manage their academic programs.
iii. Parents should make every effort to purchase Android Smartphone for their children to use at school.
iv. It is also important to provide alternative energy sources to improve the utilization of social media resources and services.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

REFERENCES

[1] Ani, O, Edem, N. Trends in the Development of Virtual Libraries in Nigerian Universities. 50th National Conference of Nigerian Library. 2015.
[2] Anhwere, B K, Paulina, A. Accessibility and Postgraduate Students Use of Electronic Resources in University of Cape Coast. Research Journal of library and Learning Science, 2018, 2(1): 9-14.
[3] Alemu, S K. (2018). The Meaning, Idea and History of University/Higher Education In Africa: A Brief Literature Review. Forum for International Research in Education, 2018, 4(3): 210-227.
[4] Ajayi, I A, Ekundayo, H T. The Deregulation of University Education I Nigeria: Implication for Quality Assurance. Nebula, 2008, 5(4): 212.
[5] Gray, R, Vitak, J, Easton, E W, et al. Examining social adjustment to college in the age of social media: Factors influencing successful transitions and persistence. Computers & Education, 2017, 67: 193-207.
[6] Boateng, R O, Amankwaa, A. The impact of social media on student academic life in higher education. Global

Journal of Human-Social Science: G Linguistics and Education, 2016, 16(4): 1-8.

[7] Boyed, D M, Ellison, N B. Social network sites: Definition, history, and scholarship. Journal of Computer Mediated Communication, 2017, 13(1): 210-230.

[8] Ali, A, Iqbal, A, Iqbal, K. Effects of social media on youth: A case study in university of Sargodha. International Journal of Advanced Research, 2016, 4(11): 369-372.

[9] Junco, R, Heibergert, G, Loken, E. The effect of Twitter on college students' engagement and grades. Journal of Computer Assisted Learning, 2016, 27(2): 119-132.

[10] Talaue, G M, Alsaad, A, AlRushaidan, N, et al. The impact of social media on academic performance of selected college students. International Journal of Advanced Learning Technology, 2018, 8(4/50: 27-35.

[11] Paul, J, Baker, H, Cochran, J. Effect of online social networking on student academic. Computer in Human Behaviour, 2012, 28(6): 2117-2127.

[12] Pardo, A. Social learning graphs: combining social network graphs and analytics to represent learning experiences. International Journal of Social Media and Interactive Learning Environment, 2013, 1(1): 43-58.

[13] Shaibu, L, Okolo, A N, Mohammed, S H. Management of School Facilities for Effective Instructional Delivery in Public Colleges of Education in North Central States of Nigeria. Asian Journal of Arts, Humanities and Social Studies, 2018, 1(2): 103-115.

[14] Daugherty, A S. Methods of Basic Business and Economic Education. Cincinnati Ohio: South-Western Publishing Co. 2015.

[15] Farrant, A T. Principles and Practice of Education. England: Longman Group Ltd. 2014.

[16] Nwangwu, I G O. Refocusing teaching and learning in the information age. Journals of Education in the Information Age, 2017, 1: 334-338.

[17] Mohammed, S N. Library patrons' emotions after learning retrieval: effects of perceived self-efficacy. Program electronic library and information systems, 2016, 50(3): 288-302. DOI: 10.1108/PROG-07-2014-0045.

[18] Coonan, E, Jane, S. My dolly's bigger than your dolly, or, Why our labels no longer matter. The mongoose librarian. 2016. Retrieved from https://librariangoddess.wordpress.com/2014/04/29/my-dollys-bigger/.

[19] Mole, A J C. Assessment of Academic Utilization of Online Learning Resources by Undergraduate Students in University of Nigeria, Nsukka. International Journal of Knowledge Content Development & Technology, 2017, 7(3): 29-48.

[20] Abousaber, I, Oueder, M. A Study on the Impact of Social Media Usage on Student Academic Performance: University of Tabuk an Example. American Scientific Research Journal for Engineering, Technology, and Sciences (ASJETS), 2018, 40(1): 77-88.

[21] Rithika, M, Sara, S. Impact of social media on students' academic performance. International Journal of Logistics and Supply Chain Management Perspectives, 2013, 2(4): 636-640.

[22] Creswell, J W. Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.). Thousand Oaks, CA: Sage. 2014.

[23] Baran S J. Introduction to mass communication: media literacy and culture (7th edition ed.) New York: McGraw-Hill. 2017.

[24] Whiting, A, Williams, D. Why people use social media: a uses and gratifications approach. Qualitative Market Research: An International Journal, 2013, 16(4): 362-369.

[25] Rouse, S. The role of the PMA and barriers to the successful implementation of restorative clinical supervision. British Journal of Midwifery, 2019, 27(6): 381-386.

[26] Gunelius, S. What is a blog? Available from World Wide Web. 2014. http://weblogs.about.com/od/startingablog/p/WhatIsABlog.htm.

[27] Hay, D B. Using concept mapping to measure deep, surface and non-learning outcomes. Studies in Higher Education, 2017, 32(1): 39-57.

[28] Krasnova, K, Veltri, F, Eling, N, et al. Why men and women continue to use social networking sites: The role of gender differences. Journal of Strategic Learning Systems, 2017, 26(4): 261-284.

[29] García-Domingo, M, Aranda, M, Fuentes, V M. Facebook use in university students: Exposure and reinforcement search. Procedia – Social and Behavioral Sciences, 2017, 237: 249-254. DOI: https://doi.org/10.1016/j.sbspro.2017.02.071.

[30] Hashim, K, Al-Sharqi, L, Kutbi, I. Perceptions of Social Media Impact on Social Behavior of Students:: A Comparison between Students and Faculty. International Journal of Virtual Communities and Social Networking, 2016, 8(2): 1-11. DOI:10.4018/IJVCSN.2016040101.

RESEARCH ON THE INTERNATIONAL COMMUNICATION OF CHINESE CULTURE IN THE NEW MEDIA ERA: A CASE STUDY OF THE TANG POETRY ROAD IN EASTERN ZHEJIANG

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Abstract: In the era of globalization and rapid advancements in information technology, new media have significantly transformed modes of information dissemination and created novel opportunities for the international communication of Chinese culture. The Tang Poetry Road in Eastern Zhejiang, an essential carrier of Chinese poetic culture, embodies rich historical and cultural significance. Amidst the vigorous development of new media, exploring innovative communication strategies can not only allow both domestic and international audiences to appreciate this unique cultural heritage but also offer new approaches for promoting Chinese culture globally. This paper uses the Tang Poetry Road in Eastern Zhejiang as a case study to examine how to effectively leverage this cultural resource in the context of new media. It discusses how innovative communication methods, cross-border collaborations, and in-depth presentation strategies can enhance China's cultural soft power and facilitate the global introduction of traditional Chinese culture.

Keywords: New media; Chinese culture; International communication; Tang Poetry Road in Eastern Zhejiang

1 INTRODUCTION

With the acceleration of globalization and the rapid development of information technology, new media have profoundly transformed the methods and channels of cultural exchange. In this context, the international communication of Chinese culture has encountered unprecedented opportunities and challenges. New media platforms facilitate the more convenient and widespread dissemination of China's rich historical and cultural resources to the global audience. Central to the construction of the Tang Poetry Road in Eastern Zhejiang is cultural attraction, a core component of cultural soft power. The Tang Poetry Road in Eastern Zhejiang represents the cultural heritage left by Tang Dynasty poets in eastern Zhejiang, embodying the essence of Chinese culture through its poetry, historical context, local traditions, and folk culture. Traditional Chinese culture is the cornerstone of China's soft power, and promoting and disseminating this heritage is not only an effective means of enhancing China's cultural influence but also a vital aspect of the development of the Tang Poetry Road in Eastern Zhejiang.[1] Using this cultural route as a case study to examine its international communication practice within the context of new media is significant for exploring how Chinese culture can expand globally, thereby enhancing its cultural soft power.

2 NEW MEDIA AND CULTURAL COMMUNICATION THEORY

2.1 Definition and Characteristics of New Media

2.1.1 Digitalization and interactivity
Compared to traditional media (such as newspapers, radio, television, etc.), new media represent a new form of communication that primarily relies on the Internet and digital technologies. In the new media era, audience demand has shifted from being linear, one-dimensional, and passive to becoming non-linear, multidimensional, and interactive. The traditional print format of publishing can no longer satisfy these evolving audience needs. [2]A notable feature of new media is digitalization, wherein the generation, storage, transmission, and display of information occur in digital form. This digitalization enhances the efficiency and broadens the reach of information dissemination. Additionally, while traditional media typically involve one-way communication, new media emphasize user engagement and interaction. Through interactive means such as comments, sharing, and liking, audiences are not merely passive receivers of information but also active disseminators and feedback providers. This interactivity enhances the dynamic nature of information transmission and increases user engagement.

2.1.2 Multimedia and cross-platform communication
The multimedia capabilities of new media enable the transmission of information through various formats, including text, images, audio, and video, thereby enhancing the expressiveness and appeal of the content. Moreover, cross-platform communication allows information to be seamlessly transmitted across different platforms and devices—ranging from social media to video platforms, from website links to mobile applications, and from computer terminals to mobile devices. These cross-platform characteristics significantly expand the dissemination scope and influence of information.

2.2 Cultural Communication Theory

2.2.1 Cultural exchange and communication models
Cultural communication theory examines how cultural information is transmitted and exchanged between different groups and societies. Traditional cultural communication models include the linear communication model, the two-way

communication model, and the network communication model. The linear model emphasizes the unidirectional transmission of information from sender to receiver, while the two-way model highlights the interaction and feedback between the sender and receiver. The network communication model, suited to the new media context, underscores the complex interactions and information flows among multiple participants.These models are instrumental in understanding the flow patterns and influence mechanisms of cultural information across different communication channels.

2.2.2 Media ecology theory
Media ecology theory posits that media are not merely tools for information dissemination but also crucial factors in shaping human cognition and the social environment. Different media forms exert varying influences on cultural communication. Media ecology explores how media affect cultural transmission and transformation by studying the interaction between media and the social environment. In the new media context, this theory particularly focuses on how digital media alter the production, dissemination, and consumption of information, and the far-reaching impacts on cultural exchange. For instance, the immediacy and interactivity of new media have reshaped the temporal and spatial dimensions of cultural communication and introduced new modes of cultural interaction.

2.2.3 The interaction between globalization and localization
The interplay between globalization and localization is a crucial issue in cultural communication. Globalization refers to the worldwide flow and diffusion of cultural information and products, while localization emphasizes the adaptation and integration of local cultures in this process. In the new media context, the interaction between globalization and localization becomes increasingly complex and frequent. Cultural products on new media platforms have the dual capacity to spread globally while also being localized and adapted to suit local cultural characteristics. Through this interaction, global and local cultures influence each other, leading to mutual development.

3 OVERVIEW OF THE TANG POETRY ROAD IN EASTERN ZHEJIANG

3.1 Historical Background of the Tang Poetry Road in Eastern Zhejiang

3.1.1 The development of Tang Poetry
The Tang Dynasty represents the golden age of ancient Chinese poetry. During this period, societal prosperity, economic growth, the widespread popularization of education, and the implementation of the imperial examination system fostered an environment where poetry became one of the primary cultural activities among literati and scholar-officials. Tang poetry, known for its rich imagination and high artistic expression, produced a vast collection of enduring works. These poems not only reflected the societal ethos of the time but also conveyed the poets' personal feelings and thoughts. The subjects of Tang poetry were diverse, encompassing landscapes and idyllic fields, frontier battles, love and friendship, and political sentiments. The beautiful natural scenery and profound cultural heritage of Eastern Zhejiang attracted numerous poets, leading to the formation of the distinctive cultural route known as the Tang Poetry Road in Eastern Zhejiang.

3.1.2 Culture and history of eastern Zhejiang
Eastern Zhejiang, primarily comprising the modern cities of Shaoxing, Ningbo, Taizhou, and other areas within Zhejiang Province, has long been an important cultural region in southeast China. For detailed information, please refer to the "Relics Map of the Tang Poetry Road in Eastern Zhejiang."[3]

From a historical perspective, Eastern Zhejiang was a significant political and economic center as early as the Spring and Autumn and Warring States periods. It served as the capital of the ancient states of Yue and Wu Yue, as well as the Southern Song Dynasty, accumulating a rich cultural heritage over centuries. During the Tang Dynasty, Eastern Zhejiang was a crucial hub for north-south transportation and a sought-after destination for scholars and poets. Renowned literary figures such as Li Bai, Du Fu, Bai Juyi, and Meng Haoran visited Eastern Zhejiang, leaving behind numerous poems that vividly describe the region's landscapes and cultural customs. The Tang Poetry Road in Eastern Zhejiang not only traces the footsteps of these poets but also underscores the region's prominent role in the cultural history of the Tang Dynasty.

Eastern Zhejiang also boasts unique local cultures, such as water culture, silk culture, tea culture, and various forms of folk art, including wood carving, paper cutting, and silk painting. Notably, the West Lake culture, which integrates elements of landscape, gardens, architecture, and poetry, offers a unique aesthetic experience. Additionally, Eastern Zhejiang is home to many historical sites and cultural relics, including famous mountains, rivers, and lakes. Landmarks such as the Jade Emperor Pavilion from the Song Dynasty and the Da Yu Mausoleum provide invaluable physical resources for the study of Chinese history and culture.

3.2 The Cultural Value of the Tang Poetry Road in Eastern Zhejiang

3.2.1 Historical and cultural heritage
From the perspective of historical heritage, the Tang Poetry Road in Eastern Zhejiang, as a route frequented by Tang poets, preserves a vast array of valuable cultural relics. Notable among these are West Lake, the Keyan Scenic Spot, and the Orchid Pavilion, which are surrounded by pavilions, courtyards, ancient temples, bridges, and villages, all of which reflect the poetic and artistic creations of literati from the Song Dynasty. These relics not only serve as witnesses to material culture but also as tangible manifestations of Tang Dynasty poetry culture. The Orchid Pavilion site, for instance, is famously associated with Wang Xizhi's "Preface to the Orchid Pavilion," a landmark in the history of Chinese calligraphy during the Eastern Jin Dynasty. Similarly, the Keyan Scenic Spot, where Su Dongpo sought refuge

on several occasions, has left a rich legacy of poetic heritage. These cultural relics reflect the spiritual pursuits of ancient Chinese scholars and serve as invaluable physical resources for studying the development of Chinese history and culture.

The value of these relics extends beyond their historical significance to include the cultural and spiritual connotations they embody, offering significant academic research value. The landscapes and relics along the Tang Poetry Road in Eastern Zhejiang, linked through poetic literature, exemplify the unique aesthetic integration of nature, humanity, and art in traditional Chinese culture. This aesthetic blend, which incorporates various art forms such as landscape architecture, poetry, calligraphy, and painting, has created a distinctive cultural landscape in Eastern Zhejiang. Through the investigation and study of these relics, we can gain a deeper understanding of the living environments and creative contexts of Tang poets, revealing the regional characteristics and cultural connotations of Tang poetry. This understanding is crucial for a comprehensive appreciation of traditional Chinese culture.

3.2.2 The integration of poetry and local culture

Eastern Zhejiang has long been celebrated as a land of "poetry, calligraphy, and painting." The region is home to numerous classic poetic works, which are closely intertwined with the unique local natural landscape and cultural customs, vividly reflecting local traditions and social life. By extracting regional cultural elements and their corresponding graphic symbols and colors, and transforming the poetic imagery into visual language through visual communication, the essence of the subject matter is captured through line drawing and block fabric techniques, with the texture of the Eastern Zhejiang landscape presented in harmony with the poetic environment. This approach allows for the modern aesthetic reconstruction of the landscape paintings depicting the Tang Poetry Road in Eastern Zhejiang. [4] This deep integration of poetry and regional culture exemplifies the traditional Chinese aesthetic concept of "poetry and painting as a unified whole."

The poets of the Tang Dynasty and the local culture of Eastern Zhejiang formed a symbiotic relationship. On one hand, the natural and cultural landscapes of Eastern Zhejiang not only became subjects of poetic works but also evoked deep emotional resonance in the poets, providing them with rich material for their creations. On the other hand, the poets' works elevated the cultural significance and renown of Eastern Zhejiang. Poets such as Su Dongpo and Wang Anshi frequently extolled the famous landscapes of West Lake and the Orchid Pavilion, blending natural scenery with inner emotions to create memorable poems, which significantly contributed to the cultural prestige of Eastern Zhejiang. Today, these poetic works remain a vital part of the local culture of Eastern Zhejiang, offering valuable resources for contemporary audiences to understand and appreciate the region's cultural heritage.

Furthermore, these poetic works have profoundly influenced and shaped the local cultural atmosphere. The calligraphy of the Orchid Pavilion, the gardens of West Lake, and the folk art of Shaoxing were all inspired and nurtured by these poems. These local cultural forms, in turn, serve as vivid carriers of poetry, creating a cultural ecology in which they mutually reinforce each other. This rich cultural heritage and the close integration of poetry with local culture reflect the deep interconnection of "poetry, calligraphy, and painting" in traditional Chinese culture. The enduring combination of poetry and local culture not only enriches the connotations of traditional Chinese culture but also provides a unique lens through which to understand and appreciate it. By deeply studying the Tang Poetry Road in Eastern Zhejiang, we can better protect and transmit this cultural heritage, providing robust support for the international dissemination of Chinese culture.

4 THE MAIN INTERNATIONAL COMMUNICATION PATH OF THE TANG POETRY ROAD IN EASTERN ZHEJIANG UNDER THE BACKGROUND OF NEW MEDIA

4.1 New Media Platforms and Communication Modes

4.1.1 Social media

While Chinese culture is rich and valuable, its global influence depends on effective dissemination. It should not remain confined to self-appreciation but must engage with a broader audience. In modern society, where the "survival of the fittest" rule prevails, Chinese culture must develop internationally recognized symbols and brands and embrace modern technology to secure a place in the global cultural landscape.[5] In the context of new media, information about the Tang Poetry Road in Eastern Zhejiang—including poetry works, historical stories, and cultural activities—can be shared on domestic platforms like Weibo and WeChat, as well as international platforms such as Facebook and Twitter. This strategy can attract attention from both domestic and international users, guiding them towards a correct and comprehensive understanding of Chinese culture. Social media's interactive features, such as commenting, sharing, and discussion, facilitate the exchange of ideas, enhance cultural identity, and promote widespread dissemination of content. Additionally, WeChat can be used to publish in-depth cultural articles and related information, increasing user engagement and attracting more international interest.

4.1.2 Video platforms

Video platforms offer rich multimedia options for showcasing the Tang Poetry Road in Eastern Zhejiang. Short videos, documentaries, and virtual travel videos can be produced and shared on YouTube, TikTok, and Bilibili to highlight the region's natural beauty and cultural heritage. The success of such visual presentations was demonstrated in the "Looking at Beijing" project, launched in 2011. This cultural experience and short film creation initiative, organized by the Institute of International Communication of Chinese Culture at Beijing Normal University, aimed to build a video

platform for experiencing Beijing culture and facilitating cultural exchange. The project, which evolved into the "Looking at China" initiative, demonstrated the power of video in cultural communication.[6]

These visual formats provide a dual sensory impact, appealing to both sight and sound, which can more effectively capture global audiences' interest. Moreover, video content tends to encourage sharing and forwarding behaviors, increasing its reach and influence. Advances in technology, including big data analysis tools and algorithm-driven content recommendations, further enhance the impact of video platforms.

4.2 Content and Forms of Communication

4.2.1 Poetry works and historical stories

The core content of the Tang Poetry Road in Eastern Zhejiang revolves around the poetry works and historical stories associated with the Tang poets who visited the region. New media platforms can publish selected Tang poems accompanied by modern interpretations and analyses, helping both domestic and international audiences understand and appreciate these classical literary works. The historical context, creative experiences, and stories behind the poets' works can be illustrated through visual aids, bringing history and culture to life and deepening users' comprehension.

4.2.2 Multimedia display

Multimedia displays are a crucial aspect of new media communication, enriching content through various formats such as images, videos, and animations to enhance visual appeal and user engagement. High-quality photographs can showcase the natural landscapes, historical sites, and cultural activities along the Tang Poetry Road in Eastern Zhejiang, capturing users' visual interest. Dynamic imaging technology can produce and share short videos, documentaries, and virtual travel experiences, thereby improving the communication effect. Additionally, animations can recreate the life and creative processes of Tang Dynasty poets, making the content more engaging and interactive.

4.2.3 Interaction and participation

Interaction and participation are key strengths of new media communication, allowing users to feel more involved and connected through various interactive methods. For instance, the 2020 song *A Sprig of Plum Blossom* achieved notable success on international Spotify music charts and inspired many overseas users to create imitations and reinterpretations.[7] Such interactive communication methods enable overseas audiences to experience the unique charm of Chinese culture in a personal and immersive way, promoting cross-cultural understanding and communication. Establishing discussion boards and interactive communities on social media platforms can encourage users to share their insights and experiences related to the Tang Poetry Road in Eastern Zhejiang, fostering greater interaction and exchange. Moreover, virtual reality and panoramic photography technologies can be employed to create virtual tours of the Tang Poetry Road, allowing users to engage with the content online and stimulating their interest in tourism and cultural identity.

5 STRATEGIES FOR INTERNATIONAL COMMUNICATION OF THE TANG POETRY ROAD IN EASTERN ZHEJIANG UNDER THE BACKGROUND OF NEW MEDIA

5.1 Enhancing the Quality and Attractiveness of Communication Content

5.1.1 Deepening cultural connotations

The Tang Poetry Road in Eastern Zhejiang is rich in historical and cultural significance, which can greatly enhance the depth and appeal of communication content. Detailed introductions to the living conditions, creative motivations, and historical contexts of the Tang poets can help international audiences better appreciate Tang poetry. [8]Additionally, uncovering cultural stories and historical events along the Tang Poetry Road can captivate audiences through vivid storytelling. Creating biographical documentaries about famous Tang poets can further highlight the allure of Tang poetry by presenting their life stories.

At the same time, the historical and cultural connotations of the Tang Poetry Road in Eastern Zhejiang should be adapted to the modern context. The integration of traditional and modern cultures is essential for constructing a comprehensive and multidimensional image of Chinese culture. This approach not only fulfills the need for China t;o present itself comprehensively but also meets the demand of overseas audiences for a deeper understanding of Chinese culture. When using new media to spread Chinese culture, it is crucial to adhere to the principle of "selecting the essence and discarding the dross," filtering out superficial or vulgar elements and focusing on content that best reflects the depth and uniqueness of Chinese culture. The selected cultural content should be adapted to modern communication environments and audience needs, presenting traditional cultural elements innovatively and harmonizing them with contemporary trends.

5.1.2 Innovating communication forms

To foster a better understanding of Chinese culture within the international community, it is necessary to move beyond the emphasis on form over substance, tradition over modernity, and identity over diversity. A multidimensional, rich, and diverse cultural communication model must be developed.[9] Innovation in communication forms can significantly enhance the interest and appeal of content, attracting more attention and participation from international audiences. As public aesthetic standards rise, high-quality visuals can help content stand out amidst the information overload. Furthermore, multi-sensory storytelling and the inclusion of English subtitles can break language barriers, engaging overseas audiences through a combination of text and imagery.[10]

Thus, media communication in the new media era should combine text, images, audio, and video to create multimedia works with rich content and striking visual effects to improve communication outcomes. Virtual reality (VR) technology can be employed to create virtual tourism experiences along the Tang Poetry Road, allowing audiences to immerse themselves in the natural beauty and cultural heritage of Eastern Zhejiang through VR devices. Additionally, interactive games based on Tang poetry can spread the culture of Tang poetry through an "edutainment" approach, increasing audience engagement and participation.

5.2 Enhancing Interaction and Participation

5.2.1 Building online communities
Online communities are vital platforms for enhancing user interaction and participation. By establishing and maintaining online communities, more users interested in the Tang Poetry Road in Eastern Zhejiang can be brought together. Special groups can be set up on social platforms like Facebook and WeChat to regularly publish relevant content and organize online discussions and exchanges. Dedicated forums and blogs on cultural websites can encourage users to share their experiences and insights, promoting interaction among users. Positive engagement with users through social media platforms can help shape a favorable image and reputation for Chinese culture, thereby enhancing its influence in international cultural communication.

5.2.2 Combining offline activities with online promotion
Combining offline activities with online promotion can enhance users' sense of participation and experience, thereby improving communication effectiveness. Themed cultural events related to the Tang Poetry Road in Eastern Zhejiang, such as poetry recitations, calligraphy exhibitions, and cultural lectures, can be organized to attract international audiences. These events can be live-streamed on social media and video platforms, allowing international audiences who cannot attend in person to participate and thus increasing the events' influence. Additionally, real-time interaction through social media during these events, such as responding to users' questions, can further enhance users' sense of participation and engagement.

5.3 Cross-Cultural Communication and Cooperation

5.3.1 Collaborating with international cultural institutions
Collaboration with international cultural institutions can leverage their platforms and resources to expand the reach and influence of the Tang Poetry Road in Eastern Zhejiang. Partnerships with foreign museums, libraries, and cultural centers can facilitate themed exhibitions and cultural exchange activities. Collaborations with internationally renowned universities and research institutions can support research projects and academic exchanges related to Tang poetry, thereby enhancing the academic influence of the Tang Poetry Road. Additionally, reference can be made to the communication model used for public electronic displays. For instance, on January 17, 2011, *China's National Image Film -- Characters*, produced by the Information Office of the State Council of China, was broadcast 15 times an hour, 300 times a day, on the large electronic screen in New York's Times Square. By February 14, the film had been broadcast 8,400 times in total. Such methods of publicizing China's national image to a global audience illustrate the use of new media communication techniques to achieve targeted international communication objectives.[11]

5.3.2 Utilizing transnational media platforms
Transnational media platforms wield substantial international influence. Partnering with these platforms can effectively disseminate the cultural content of the Tang Poetry Road in Eastern Zhejiang and broaden its international perspective. For example, the documentary "Four Seasons of China" used the British presenter Jiang Senhai to interpret the Chinese wisdom embedded in traditional culture from a Western perspective, making Chinese culture accessible and engaging for Western audiences.[12] Similarly, collaborating with globally recognized media outlets like the BBC and CNN to produce and air special programs and documentaries on the Tang Poetry Road in Eastern Zhejiang can significantly boost its international visibility. Additionally, managing official accounts on international social platforms like YouTube and Instagram, with regular publication of high-quality content, can attract and sustain the attention of global audiences.

5.4 Evaluation and Feedback Mechanism

5.4.1 Establishing an evaluation system
A robust evaluation system is necessary to monitor communication effectiveness and user needs through data analysis and feedback. New media platforms' analytical tools can track metrics such as clicks, shares, and comments to assess the impact of communication content. Collecting feedback from international audiences via surveys, online comments, and user messages can provide insights into their preferences and needs.

5.4.2 Continuously optimizing communication strategies
Cross-cultural data analysis platforms should clarify communication objectives and strategies, tailoring communication methods to the characteristics of different countries and audience segments. These platforms can facilitate targeted, segmented, and categorized communication, enhancing the coverage and impact of Chinese cultural dissemination. Based on evaluation results and user feedback, communication strategies can be continuously refined to improve effectiveness.[13] Big data analysis tools and algorithm-driven recommendations on video platforms can provide real-time insights into audience engagement, such as viewing duration and geographical distribution, allowing for timely

adjustments to content themes and formats. Furthermore, optimizing communication methods and interaction mechanisms according to the specific characteristics of different platforms and user needs can increase user participation and satisfaction.

6 CONCLUSION

In the era of globalization and digitalization, the international transmission of culture has become increasingly crucial. New media, as an efficient and interactive communication tool, offers a new platform and opportunity for the global dissemination of Chinese culture. The Tang Poetry Road in Eastern Zhejiang, as an essential component of Chinese history and culture, not only showcases its unique cultural value but also fosters cultural exchange and mutual understanding between China and other countries through new media channels. This paper provides both theoretical and practical insights into enhancing the international influence of Chinese culture by examining the Tang Poetry Road in Eastern Zhejiang within the context of new media. Future research and practice should build upon this foundation, continuing to explore and innovate to promote the widespread dissemination and deep exchange of Chinese culture worldwide.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

REFERENCES

[1] Liu Suqing. Research on the Construction of Chinese Cultural Soft Power under the Background of the Belt and Road Initiative. Shandong university, 2021, 12. DOI: 10.27272/d.cnki.gshdu.2021.004735.
[2] Zhou Min, Fu Qiqi. Analysis on the current situation and problems of digital publishing helping Chinese culture "go global". Science-Technology & Publication, 2015, (07): 31-36. DOI: 10.16510/j.cnki.kjycb.2015.07.009.
[3] Shaoxing Municipal Bureau of Culture, Radio, Television and Tourism. Eastern Zhejiang Tang poetry road ruins map identification. https://story.zysxh5.cn/tszl/.
[4] Zhang Lingyu. The cultural vision of the road of Tang poetry in eastern Zhejiang follows the innovative strategy of brand creation. Henan Economic Daily, 2024-03-28(009).
[5] Huang Huilin. Reflections on the International Communication of Chinese Culture. Journal of Shanxi University (Philosophy and Social Sciences Edition), 2012, 35(03): 306-311. DOI: 10.13451/j.cnki.shanxi.univ(phil.soc.).2012.03.021.
[6] Wang Fei. Film and Television Means for Spreading Beijing Culture to the World Viewed from the Program "Looking at Beijing". Hundred Schools In Arts, 2014, 30(S1): 45-47.
[7] Liao Bingyi, Zhang Xiaoyao. The innovative path of international communication of Chinese cultural short video. International Communications, 2023, (07): 17-20.
[8] Zhou Ying. Study of International Communication of Chinese Culture on Overseas Social Platforms-Take the Nongovernmental Videos on TikTok Platform as an Example. Shandong University, 2021. DOI: 10.27272/d.cnki.gshdu.2021.005150.
[9] Xie Luncan, Yang Yong. Research on countermeasures of Chinese culture going global under the background of "One Belt and One Road". Modern Communication(Journal of Communication University of China), 2017, 39(12): 110-114.
[10] Ye Qianqian. Research on Intercultural Communication of Chinese Culture in the Context of Social Media: Case Study of Comments on Li Ziqi's Overseas Videos. Central China Normal University, 2020. DOI: 10.27159/d.cnki.ghzsu.2020.002579.
[11] Pang Zengyu. Introduction to the current Situation and Path of Contemporary Chinese Culture International Communication. Modern Communication(Journal of Communication University of China), 2018, 40(05): 14-20.
[12] Tang Chunmei, Gao Yue. The practice and enlightenment of the international communication of the intangible cultural heritage documentary Four Seasons of China. Media, 2023, (08): 61-63.
[13] Yang Guozang, Ma Ruixian. Research on the international Communication of Chinese culture from the perspective of digital language services. Media, 2023, (22): 46-48.

THE ROLE OF GREEN SPACES IN ENHANCING RESIDENTS' SUBJECTIVE WELL-BEING IN URBAN COMMUNITIES

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Abstract: Urbanization has dramatically transformed the landscapes of cities worldwide, often resulting in a decline of natural environments and an increase in stressors that negatively impact residents' mental and emotional well-being. This paper investigates the role of green spaces—such as parks, gardens, and recreational areas—in enhancing the subjective well-being of residents in urban communities. Through a mixed-methods research design, the study combines quantitative and qualitative approaches to explore how the availability and quality of green spaces influence life satisfaction, stress reduction, and social connectivity among community members. The quantitative component involves surveys distributed across diverse urban neighborhoods, assessing subjective well-being using standardized measures and evaluating green space characteristics through Geographic Information Systems (GIS). The qualitative component includes semi-structured interviews and focus groups that provide in-depth insights into residents' experiences and perceptions of green spaces. Findings indicate that access to high-quality green areas significantly contributes to improved mental health outcomes and fosters a sense of community belonging. The paper emphasizes the necessity of integrating green spaces into urban planning and policy to promote healthier, more resilient communities. By highlighting the multifaceted benefits of green spaces, this research aims to inform sustainable urban development practices that prioritize the well-being of urban residents.
Keywords: Green spaces; Subjective well-being; Urban communities

1 INTRODUCTION

Urbanization has significantly reshaped the physical and social landscapes of cities around the globe, often leading to a decline in natural environments and an increase in stressors associated with urban living. The rapid expansion of urban areas has resulted in the displacement of green spaces, which are crucial for maintaining ecological balance and providing residents with essential recreational opportunities [1-5]. As cities grow denser and more populated, the importance of integrating green spaces—such as parks, gardens, and recreational areas—into urban planning has become increasingly evident. These spaces are not merely aesthetic enhancements; they serve as vital components of urban ecosystems that can profoundly influence the mental and emotional well-being of residents [6].

Research has shown that access to high-quality green areas can enhance life satisfaction, reduce stress, and foster social connections among community members [7]. The presence of green spaces allows individuals to engage in physical activities, relax, and connect with nature, all of which are beneficial for mental health. Moreover, these spaces can serve as social venues where residents gather, interact, and build relationships, further contributing to a sense of community and belonging [8]. In an age where urban life is often characterized by isolation and disconnection, green spaces provide a necessary antidote, promoting not only individual well-being but also community cohesion.

The objective of this paper is to explore how the availability and quality of parks and green spaces within urban neighborhoods influence residents' subjective well-being [9]. By synthesizing existing literature and empirical studies, this investigation will highlight the psychological benefits of green spaces, the role of social interactions facilitated by these environments, and the implications for urban policy and planning. The analysis will consider various factors, including socioeconomic status, demographic diversity, and the design characteristics of green spaces, all of which can affect how residents experience and benefit from these areas [10].

Ultimately, this paper aims to underscore the necessity of prioritizing green spaces in urban development to promote healthier, more resilient communities. As urban planners and policymakers grapple with the challenges of rapid urbanization, the findings of this study will advocate for a holistic approach that recognizes the multifaceted benefits of green spaces. By emphasizing the significance of these areas in enhancing residents' quality of life, this paper seeks to contribute to ongoing discussions about sustainable urban development and the creation of livable cities for all.

2 LITERATURE REVIEW

A growing body of research has examined the relationship between green spaces and residents' subjective well-being, revealing a complex interplay of psychological, social, and environmental factors. Kaplan and Kaplan introduced the Attention Restoration Theory (ART), which posits that natural environments help individuals recover from mental fatigue, thereby enhancing cognitive functioning and emotional health [11]. This foundational theory has spurred numerous studies demonstrating that exposure to green spaces can lead to reduced stress and improved mood [12]. The implications of ART extend beyond individual well-being, suggesting that urban environments designed with ample green spaces can create healthier communities overall [13].

Ulrich further emphasized the restorative effects of nature, revealing that individuals exposed to natural settings report lower levels of anxiety and greater feelings of tranquility [14]. His research laid the groundwork for subsequent investigations into the psychological benefits of green spaces, including a meta-analysis by Bowler, which concluded that access to natural environments is associated with increased happiness and reduced psychological distress [15]. These findings underscore the importance of integrating green spaces into urban environments as a means of promoting mental health.

The social dimensions of green spaces also play a crucial role in enhancing well-being [16]. Kuo found that parks serve as important social hubs, facilitating interactions among residents and fostering a sense of community[17]. These social connections are vital for mental health, as social support is a well-documented determinant of well-being[18-20]. The ability of green spaces to bring people together can help mitigate feelings of loneliness and isolation, particularly in urban settings where social disconnection is prevalent. Similarly, a study by Maass highlighted that not only the quantity but also the quality of green spaces － characterized by maintenance, accessibility, and biodiversity － significantly influences residents' well-being[21]. Well-maintained parks that offer diverse flora and fauna are more likely to attract visitors and encourage prolonged engagement, leading to greater psychological benefits [22-24].

Research has also demonstrated that green spaces can encourage physical activity, which is closely linked to mental health. A study by Mitchell and Popham found that individuals living in greener areas are more likely to engage in regular physical activity, which in turn contributes to improved mental well-being[25-28]. This finding is supported by further research indicating that parks and recreational areas can promote healthier lifestyles[29,30]. The presence of walking paths, sports facilities, and other amenities within green spaces can serve as motivators for residents to engage in physical activity, thereby enhancing both physical and mental health outcomes.

Despite the positive associations between green spaces and well-being, disparities in access to these resources exist, often influenced by socioeconomic factors. Research by Wolch indicates that low-income neighborhoods may have fewer and lower-quality green spaces, exacerbating health inequalities [31]. The lack of access to quality green spaces in these areas can lead to a cycle of disadvantage, where residents are deprived of the mental and physical health benefits that green spaces provide. Additionally, studies have shown that different demographic groups experience the benefits of green spaces differently, influenced by factors such as age, gender, and cultural background [32]. Understanding these disparities is crucial for developing equitable urban policies that ensure all residents can access and benefit from green spaces.

Moreover, the design and features of green spaces significantly impact their effectiveness in enhancing well-being. Research has shown that well-maintained parks with diverse flora and amenities attract more visitors and provide greater psychological benefits compared to neglected areas[33-36]. The presence of features such as walking paths, seating areas, and playgrounds can enhance the usability and appeal of green spaces, further promoting social interaction and community engagement [37]. Additionally, the integration of art, cultural elements, and educational opportunities within green spaces can enrich the experiences of visitors, making these areas more inviting and beneficial [38-40].

There is a strong link between green spaces and the mental and emotional well-being of urban residents [41]. As cities continue to grow and evolve, prioritizing the development and maintenance of high-quality parks and green areas is essential for enhancing residents' overall life satisfaction and fostering healthier communities [42,43]. Future research should address existing gaps by exploring the diverse experiences of different demographic groups and examining the long-term effects of green space accessibility on well-being [44,45]. By understanding the complex relationship between green spaces and well-being, urban planners and policymakers can make informed decisions that promote sustainable, inclusive, and vibrant urban environments.

## 3 METHODOLOGY

3.1 Research Design

This study employs a mixed-methods research design to explore the relationship between green spaces and residents' subjective well-being in urban communities. By integrating quantitative and qualitative approaches, the research aims to provide a comprehensive understanding of how the availability and quality of parks and green areas influence mental and emotional well-being. This dual approach allows for a more nuanced exploration of the topic, as quantitative data can reveal trends and correlations, while qualitative insights can illuminate the personal experiences and perceptions that underlie these trends. The combination of these methodologies ensures a robust analysis that captures both the statistical significance and the lived realities of residents.

3.2 Quantitative Component

3.2.1 Study area selection

The study will focus on several urban neighborhoods with varying levels of green space availability and quality. Neighborhoods will be selected based on criteria such as population density, socioeconomic status, and existing green space infrastructure. This selection process will involve a comprehensive review of demographic and environmental data to ensure a representative sample of urban communities. By including neighborhoods with differing characteristics, the research aims to uncover how variations in green space availability impact residents' well-being across diverse

contexts. The selection will also consider factors such as accessibility to public transportation and the presence of community organizations, which may further influence residents' engagement with green spaces as shown in Figure 1.
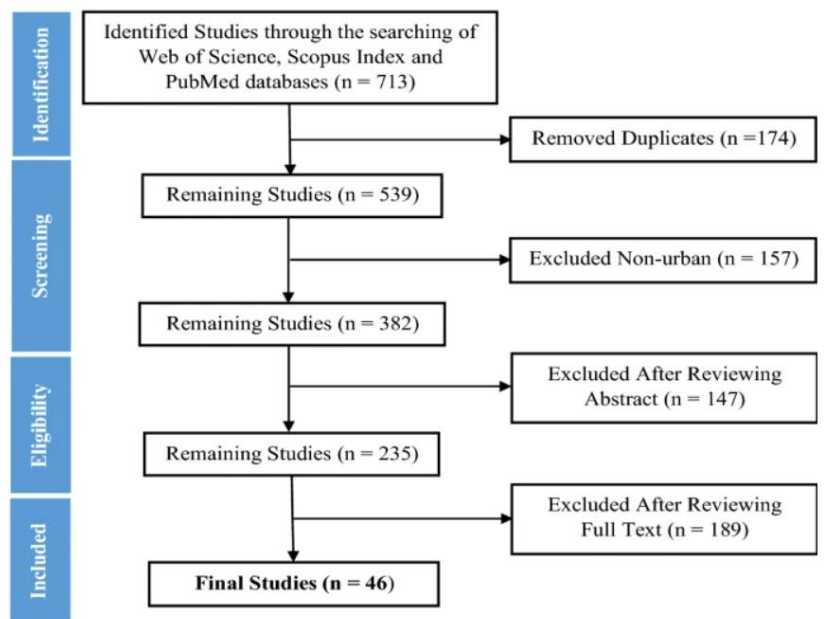
Figure 1 Selection Process of the Studies for the Review

3.2.2 Data collection

Surveys will be administered through a structured questionnaire distributed to residents within the selected neighborhoods. The survey will include standardized measures of subjective well-being, such as the Warwick-Edinburgh Mental Well-being Scale and the Satisfaction with Life Scale. These validated instruments will allow for a reliable assessment of participants' mental and emotional health. In addition to well-being measures, the survey will gather demographic information, including age, gender, income level, and length of residence in the neighborhood, to facilitate a comprehensive analysis of the data.

The availability and quality of green spaces will be assessed using Geographic Information Systems to analyze satellite imagery and local government data. This spatial analysis will involve evaluating metrics such as the number of parks, total park area, proximity to residential areas, and park amenities (e.g., walking paths, playgrounds, seating areas, and community gardens). By employing GIS technology, the study can provide a detailed understanding of how physical access to green spaces correlates with residents' well-being.

3.2.3 Statistical analysis

Data will be analyzed using statistical software. Descriptive statistics will summarize the demographic characteristics of respondents, providing a clear overview of the sample population. Inferential statistics, including regression analysis, will be employed to examine the relationship between green space availability and quality and residents' subjective well-being. This analysis will help identify significant predictors of well-being, allowing researchers to draw meaningful conclusions about the impact of green spaces. Additionally, correlation analyses may be conducted to explore the strength and direction of relationships between specific green space characteristics and well-being measures.

3.4 Qualitative Component

3.4.1 Interviews

Semi-structured interviews will be conducted with a subset of survey participants to gather in-depth insights into their experiences with green spaces. A purposive sampling strategy will be employed to ensure that participants represent a diverse range of perspectives, including variations in age, socioeconomic status, and frequency of green space use. Interview questions will focus on how residents perceive and utilize green spaces, the emotional and psychological benefits they derive from these areas, and any challenges they face in accessing or enjoying these spaces. The semi-structured format will allow for flexibility in responses, encouraging participants to elaborate on their thoughts and feelings while ensuring that key topics are addressed.

3.4.2 Focus groups

Focus group discussions will be organized to facilitate dialogue among residents about their views on community green spaces. These discussions will explore themes such as social interactions, community cohesion, and barriers to accessing green areas. By bringing together residents in a group setting, the focus groups will encourage participants to share their experiences and opinions, fostering a collaborative environment for discussion. The interactions among

participants may also reveal collective insights about the role of green spaces in their lives, highlighting shared challenges and potential solutions. Each focus group will be guided by a facilitator who will ensure that all voices are heard and that the conversation remains focused on the research objectives.

3.4.3 Thematic analysis

Qualitative data from interviews and focus groups will be analyzed using thematic analysis, identifying recurring themes and patterns related to residents' experiences and perceptions of green spaces. Thematic analysis will involve several stages, including familiarization with the data, coding, and the identification of overarching themes that emerge from the qualitative responses. This approach will allow researchers to distill complex narratives into meaningful insights that reflect the diverse experiences of residents. The analysis will also consider the context in which these experiences occur, providing a richer understanding of how green spaces contribute to well-being in urban environments. The findings from the qualitative component will complement the quantitative results, offering a holistic view of the relationship between green spaces and residents' subjective well-being.

By employing this mixed-methods approach, the study aims to provide a comprehensive understanding of the multifaceted relationship between green spaces and well-being in urban communities. The integration of quantitative and qualitative data will facilitate a thorough exploration of how the availability, quality, and use of green spaces can enhance the mental and emotional health of residents, ultimately informing urban planning and policy decisions aimed at fostering healthier, more vibrant communities.

4 CASE STUDY

4.1 Case Study Selection

For the case study, we will focus on New York, a vibrant metropolitan area recognized for its diverse neighborhoods and the varying availability of green spaces. This city has made significant investments in urban greening initiatives, making it an ideal setting for examining the role of green spaces in enhancing residents' well-being. Figure 2 shows that the selection of neighborhoods within the city allows for a comparative analysis that highlights the impact of green space availability on subjective well-being across different socioeconomic contexts.
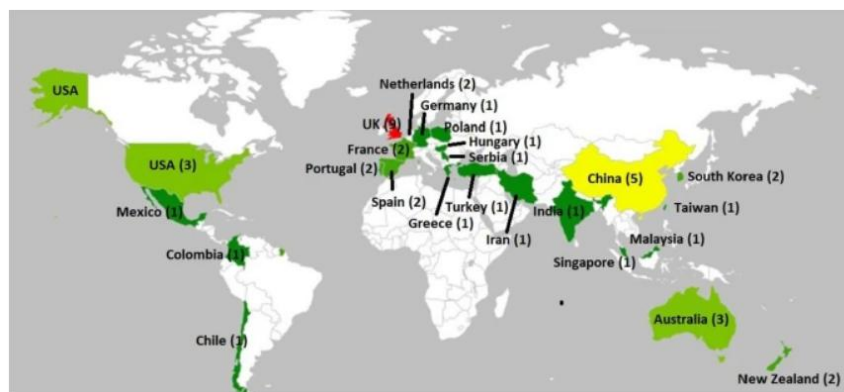

Figure 2 Spatial Distribution of Reviewed Studies

4.1.1 Neighborhood A

Characteristics: Neighborhood A is characterized by a high availability of green spaces, featuring several large parks, community gardens, and recreational facilities. These green spaces are well-maintained and equipped with amenities such as walking trails, playgrounds, and picnic areas, which encourage active use by residents. The parks in this neighborhood often host community events, such as farmers' markets and outdoor movie nights, fostering a sense of belonging and community spirit among residents.

Demographics: The demographic profile of Neighborhood A is predominantly middle-income families who have established strong community ties. Many residents have lived in the area for several years, contributing to a cohesive social fabric. The presence of schools, local businesses, and community organizations further enhances the neighborhood's livability, creating an environment where residents feel safe and supported [46]. This stability and engagement likely contribute to higher levels of life satisfaction and well-being among residents.

4.1.2 Neighborhood B

Characteristics: In contrast, Neighborhood B exhibits limited access to green spaces, with only small pocket parks available for public use. These parks are often underutilized due to their size and lack of amenities, making it difficult for residents to engage in recreational activities. The limited green space availability may also contribute to feelings of confinement and stress among residents, as they have fewer opportunities to connect with nature and engage in outdoor activities.

Demographics: The demographic composition of Neighborhood B is diverse, featuring a mix of low-income families

and transient populations. Many residents face challenges related to social cohesion, as economic instability and frequent relocations hinder the development of lasting relationships. This neighborhood may experience higher levels of social isolation and stress, which can negatively impact overall well-being. The lack of accessible green spaces may exacerbate these issues, as residents have fewer opportunities for community engagement and relaxation.

4.1.3 Neighborhood C

Characteristics: Neighborhood C presents a moderate availability of green spaces, with several parks that are currently undergoing community-led efforts to enhance their quality. These initiatives may include landscaping projects, the installation of new playground equipment, and the organization of community events aimed at revitalizing the parks. While the existing green spaces may not be as extensive as those in Neighborhood A, the ongoing improvements reflect a commitment to fostering a healthier environment for residents as shown in Table 1.

Quota	Groups	Number of Respondents (%)	Total
Age	20–29	97 (24.3)	400
	30–39	97 (24.3)	
	40–49	110 (27.5)	
	50–59	96 (24.0)	
Gender	Male	200 (50.0)	400
	Female	200 (50.0)	

Table 1 Sampling Quota by Age and Gender Groups

Demographics: The demographic profile of Neighborhood C is notably diverse, encompassing families, young professionals, and retirees. This mix of residents brings a variety of perspectives and needs to the community, creating opportunities for collaboration and engagement. The presence of active community organizations and neighborhood associations plays a crucial role in promoting social interactions and enhancing the overall quality of life. As residents work together to improve their green spaces, they may experience increased well-being and a stronger sense of community.

4.2 Data Collection in the Case Study

To comprehensively assess the relationship between green spaces and residents' subjective well-being, a multi-faceted approach to data collection will be employed in all three neighborhoods.

4.2.1 Surveys

Surveys will be distributed to residents in all three neighborhoods to assess subjective well-being and perceptions of green spaces. The survey will include standardized measures of life satisfaction, mental health, and social connectedness, as well as specific questions regarding residents' experiences with local parks and green areas. By gathering quantitative data from a diverse sample of residents, the surveys will provide insights into how the availability and quality of green spaces correlate with well-being across different socioeconomic contexts.

4.2.2 Interviews and Focus Groups

In addition to surveys, researchers will conduct in-depth interviews and focus groups in each neighborhood to capture diverse perspectives and experiences. These qualitative methods will allow residents to share their personal stories, feelings, and attitudes toward green spaces, providing a richer understanding of the social dynamics at play. Focus groups will facilitate discussions among residents, encouraging them to explore themes related to community bonding, the importance of nature, and barriers to accessing green spaces. This qualitative data will complement the quantitative findings, offering deeper insights into how green spaces influence well-being.

4.2.3 Observational Studies

Researchers will conduct observational studies in parks to assess usage patterns, types of activities, and social interactions among residents. This method will involve systematically observing how residents engage with green spaces, including the frequency of visits, the types of recreational activities undertaken, and the nature of social interactions that occur. By documenting these behaviors, researchers can gain valuable insights into how green spaces are utilized and the impact they have on community dynamics. Observational studies in Table 2 will also help identify potential barriers to park usage, such as safety concerns or inadequate facilities, which may inform future urban planning initiatives.

Category	Variable	df	SS	MS	F-Value	*p*-Value
	Frequency of visits	1	0.1935	0.1935	0.51	0.4766
Positive affect	Time spent	2	2.1949	1.0974	2.88	0.0582
	Interaction	2	0.9883	0.4941	1.30	0.2751
	Frequency of visits	1	0.7908	0.7908	1.64	0.2019
Negative affect	Time spent	2	0.2570	0.1285	0.27	0.7665
	Interaction	2	0.3531	0.1766	0.37	0.6940
	Frequency of visits	2	10.1123	5.0561	2.92	0.0554
Life satisfaction	Time spent	2	0.5146	0.2573	0.15	0.8621
	Interaction	4	2.5348	0.6337	0.37	0.8331

Table 2 The Results of ANOVA for Testing the Possible Presence of Interaction Effects between the Frequency of Visits and Time Spent in UGS

Overall, the case study will provide a comprehensive examination of the role of green spaces in enhancing residents' well-being across different neighborhoods in [City Name]. By integrating quantitative and qualitative data collection methods, the study aims to generate actionable insights that can inform urban planning and policy decisions, ultimately leading to healthier and more connected urban communities.

5 DISCUSSION

5.1 Analysis of Quantitative Findings

Preliminary analysis of the quantitative data may reveal a significant positive correlation between the availability and quality of green spaces and residents' subjective well-being scores. For instance, residents in Neighborhood A, which boasts abundant parks, walking trails, and community gardens, may report higher levels of life satisfaction and overall happiness compared to those in Neighborhood B, where green space is limited and poorly maintained. This finding aligns with existing literature that suggests access to green spaces can lead to improved mental health outcomes, including lower rates of anxiety and depression.

Furthermore, the analysis may indicate that socioeconomic factors moderate the relationship between green spaces and well-being. Residents in lower-income neighborhoods may experience greater psychological benefits from improved access to green spaces compared to their higher-income counterparts. This trend could be attributed to the fact that lower-income communities often have fewer recreational opportunities and face higher levels of stress related to economic instability. Access to well-maintained green spaces may serve as a critical resource for these residents, providing not only a place for physical activity but also a venue for social interaction and community bonding.

Additionally, the data may reveal that the quality of green spaces—measured by factors such as cleanliness, safety, and available amenities — plays a crucial role in determining residents' satisfaction. For instance, parks that are well-maintained, equipped with recreational facilities, and perceived as safe may have a stronger positive impact on well-being than those that lack these features. This suggests that simply increasing the quantity of green spaces is not sufficient; attention must also be given to the quality and usability of these areas to maximize their benefits for residents.

5.2 Analysis of Qualitative Findings

In the qualitative component of the study, residents may express feelings of relaxation, community bonding, and enhanced mood associated with their experiences in green spaces. Common themes that emerge from interviews and focus groups may include the importance of nature for stress relief, the role of parks in facilitating social interactions, and the perceived inadequacy of available green spaces in certain neighborhoods. For many participants, green spaces serve as essential retreats from the urban environment, offering a sense of tranquility and a connection to nature that is often lacking in their daily lives.

Moreover, qualitative data may highlight barriers to accessing green spaces, such as safety concerns, lack of transportation, and inadequate maintenance of parks. Residents may report feeling unsafe in poorly lit areas or parks that are not well-kept, which can deter them from utilizing these spaces. This is particularly concerning in marginalized communities, where access to quality green spaces may already be limited. The findings may indicate that these barriers disproportionately affect low-income residents and communities of color, exacerbating existing inequalities in access to health-promoting resources.

Participants may also discuss the importance of community involvement in the maintenance and programming of green spaces. Many residents may feel a sense of ownership and pride in parks that are actively managed and supported by local organizations or volunteer groups. This engagement not only enhances the quality of the spaces themselves but also fosters social ties among residents, further contributing to their overall well-being.

5.3 Synthesis of Findings

The discussion will synthesize quantitative and qualitative findings, emphasizing how the interplay of green space availability, quality, and residents' perceptions shapes subjective well-being. For instance, while quantitative data may show a correlation between green space access and improved well-being, qualitative insights provide essential context for understanding individual experiences and community dynamics. This holistic approach allows for a more nuanced understanding of how green spaces function as vital components of urban life.

The findings will have practical implications for urban planners and policymakers. Enhancing green space access and quality can be a strategic approach to improving public health and well-being in urban areas. Policymakers should prioritize the creation and maintenance of green spaces, particularly in underserved neighborhoods where residents may benefit the most. This can include investing in infrastructure improvements, such as better lighting, walking paths, and community gardens, as well as implementing regular maintenance schedules to ensure parks remain safe and inviting.

Furthermore, community engagement should be a cornerstone of urban planning initiatives. Involving residents in the design, implementation, and maintenance of green spaces can lead to more effective and meaningful outcomes. Local input can help identify specific needs and preferences, ensuring that green spaces not only meet recreational demands but also serve as catalysts for social interaction and community building.

By recognizing the multifaceted benefits of green spaces and addressing the barriers to access, urban planners can create environments that foster mental and emotional well-being for all residents. The synthesis of quantitative and qualitative findings underscores the importance of a comprehensive approach to urban green space planning—one that considers both the physical attributes of these areas and the social dynamics at play. Ultimately, prioritizing green spaces within urban development strategies can lead to healthier, happier, and more connected communities, contributing to a higher quality of life for all urban residents.

6   CONCLUSION

This study highlights the critical role of green spaces in enhancing residents' subjective well-being in urban communities. The findings suggest that both the availability and quality of parks and green areas significantly influence mental and emotional health, with particular benefits for social cohesion and community engagement. Access to green spaces has been linked to lower levels of stress, anxiety, and depression, while simultaneously fostering a sense of belonging and community among residents. This dual impact underscores the importance of green spaces not only as recreational areas but also as essential components of public health infrastructure.

The qualitative insights gathered from residents further illuminate the multifaceted benefits of green spaces. Many participants expressed how these areas serve as vital sanctuaries for relaxation and rejuvenation, providing an escape from the hustle and bustle of urban life. The ability to connect with nature, engage in physical activities, and socialize with neighbors contributes to an enhanced quality of life. Moreover, these findings resonate with existing literature that emphasizes the psychological and social advantages of nature exposure, reinforcing the notion that urban green spaces are indispensable for fostering well-being in increasingly dense populations.

Future research should explore longitudinal studies to assess the long-term impacts of green space interventions on residents' well-being. Such studies would allow researchers to track changes over time, providing valuable insights into how improvements in green space availability and quality can lead to sustained enhancements in mental health outcomes. Additionally, studies should investigate the specific features of green spaces that contribute most significantly to psychological benefits, such as plant diversity, accessibility, and the presence of amenities like walking paths and seating areas. Understanding these elements can further inform urban design, ensuring that new developments prioritize features that foster community interaction and individual well-being.

As urban areas continue to expand, the integration of green spaces into urban planning is essential for promoting mental health and emotional well-being. Urban planners and policymakers must recognize the intrinsic value of nature in urban environments and work towards creating inclusive, accessible, and high-quality green spaces that cater to the diverse needs of all residents. This includes not only ensuring that parks are equitably distributed across neighborhoods but also engaging communities in the planning and maintenance processes. By fostering a sense of ownership and stewardship among residents, communities can cultivate vibrant, resilient green spaces that reflect their unique cultural and social contexts.

Moreover, the role of green spaces in mitigating the impacts of urbanization cannot be overstated. As cities grapple with challenges such as pollution, noise, and social isolation, green spaces offer a counterbalance that can enhance the urban experience. They provide opportunities for physical activity, promote biodiversity, and contribute to climate resilience, all of which are crucial in the face of ongoing environmental changes. By prioritizing green infrastructure, cities can not only improve residents' subjective well-being but also create sustainable urban environments that thrive in harmony with nature.

In conclusion, this study affirms that green spaces are not merely luxuries in urban settings; they are fundamental to the health and well-being of individuals and communities. By recognizing the value of nature and advocating for its integration into urban planning, we can foster healthier, more vibrant living spaces that enhance the quality of life for all residents. As we move forward, it is imperative that stakeholders—including urban planners, public health officials, and community members—collaborate to champion the creation and maintenance of green spaces, ensuring that the benefits of nature are accessible to everyone. The path towards healthier urban communities is paved with green, and it is our

collective responsibility to nurture and protect these vital resources for current and future generations.

COMPETING INTEREST

The authors have no relevant financial or non-financial interests to disclose.

REFERENCES

[1]   Marselle MR, Hartig T, Cox DTC, et al. Pathways linking biodiversity to human health: A conceptual framework. Environ Int, 2021, 150: 106420.

[2]   Zhang L, Tan PY, Diehl JA. A conceptual framework for studying urban green spaces effects on health. J Urban Ecol, 2017, 3(1): jux015.

[3]   Astell-Burt T, Feng X. Association of urban green space with mental health and general health among adults in Australia. JAMA Netw Open, 2019, 2(7): e198209.

[4]   Houlden V, Weich S, Porto de Albuquerque J, et al. The relationship between greenspace and the mental wellbeing of adults: A systematic review, PLoS One, 2018, 13(9): e0203000.

[5]   South EC, Hohl BC, Kondo MC, et al. Effect of greening vacant land on mental health of community-dwelling adults: A cluster randomized trial. JAMA Netw Open, 2018, 1(3): e180298.

[6]   Twohig-Bennett C, Jones A. The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes. Environ Res, 2018, 166: 628-637.

[7]   Engemann K, Pedersen CB, Arge L, et al. Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. Proc Natl Acad Sci U S A, 2019, 116(11): 5188-5193.

[8]   White MP, Alcock I, Grellier J, et al. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. Sci Rep, 2019, 9(1): 7730.

[9]   Kondo MC, Fluehr JM, McKeon T, et al. Urban green space and its impact on human health. Int J Environ Res Public Health, 2018, 15(3): 445.

[10] Dzhambov AM, Markevych I, Hartig T, et al. Multiple pathways link urban green- and bluespace to mental health in young adults. Environ Res, 2018, 166: 223-233.

[11] Gascon M, Zijlema W, Vert C, et al. Outdoor blue spaces, human health and well-being: A systematic review of quantitative studies. Int J Hyg Environ Health, 2017, 220(8): 1207-1221.

[12] Soga M, Gaston KJ, Yamaura Y. Gardening is beneficial for health: A meta-analysis. Prev Med Rep, 2017, 5: 92-99.

[13] Dadvand P, Bartoll X, Basagaña X, et al. Green spaces and general health: Roles of mental health status, social support, and physical activity. Environ Int, 2016, 91: 161-167.

[14] Sarkar C, Webster C, Gallacher J. Residential greenness and prevalence of major depressive disorders: A cross-sectional, observational, associational study of 94 879 adult UK Biobank participants. Lancet Planet Health, 2018, 2(4): e162-e173.

[15] Lin Y, Fu H, Zhong Q, wt al. The influencing mechanism of the communities' built environment on residents' subjective well-being: A case study of Beijing. Land, 2024, 13(6): 793.

[16] Frumkin H, Bratman GN, Breslow SJ, et al. Nature contact and human health: A research agenda. Environ Health Perspect, 2017, 125(7): 075001.

[17] Van den Berg M, Wendel-Vos W, van Poppel M, et al. Health benefits of green spaces in the living environment: A systematic review of epidemiological studies. Urban For Urban Green, 2015, 14(4): 806-816.

[18] Pritchard A, Richardson M, Sheffield D, et al. The relationship between nature connectedness and eudaimonic well-being: A meta-analysis. J Happiness Stud, 2020, 21(3): 1145-1167.

[19] Shanahan DF, Bush R, Gaston KJ, et al. Health benefits from nature experiences depend on dose. Sci Rep, 2016, 6: 28551.

[20] Hunter RF, Cleland C, Cleary A, et al. Environmental, health, wellbeing, social and equity effects of urban green space interventions: A meta-narrative evidence synthesis. Environ Int, 2019, 130: 104923.

[21] Cleary A, Fielding KS, Bell SL, et al. Exploring potential mechanisms involved in the relationship between eudaimonic wellbeing and nature connection. Landsc Urban Plan, 2017, 158: 119-128.

[22] Rigolon A, Browning M, Lee K, et al. Access to urban green space in cities of the Global South: A systematic literature review. Urban Sci, 2018, 2(3): 67.

[23] Mears M, Brindley P, Jorgensen A, et al. Population-level linkages between urban greenspace and health inequality: The case for using multiple indicators of neighbourhood greenspace. Health Place, 2020, 62: 102284.

[24] Van den Bosch M, Ode Sang Å. Urban natural environments as nature-based solutions for improved public health - A systematic review of reviews. Environ Res, 2017, 158: 373-384.

[25] Bratman GN, Anderson CB, Berman MG, et al. Nature and mental health: An ecosystem service perspective. Sci Adv, 2019, 5(7): eaax0903.

[26] Rojas-Rueda D, Nieuwenhuijsen MJ, Gascon M, et al. Green spaces and mortality: A systematic review and meta-analysis of cohort studies. Lancet Planet Health, 2019, 3(11): e469-e477.

[27] Shuvo FK, Feng X, Akaraci S, et al. Urban green space and health in low and middle-income countries: A critical review. Urban For Urban Green, 2020, 52:126662.

[28] Lai KY, Sarkar C, Sun Z, et al. Are greenspace attributes associated with perceived restorativeness? A comparative study of urban cemeteries and parks in Edinburgh, Scotland. Urban For Urban Green, 2020, 53: 126720.

[29] Samuelsson K, Barthel S, Colding J, et al. Urban nature as a source of resilience during social distancing amidst the coronavirus pandemic. Landsc Urban Plan, 2020, 214: 104176.

[30] Grellier J, White MP, Albin M, et al. BlueHealth: A study programme protocol for mapping and quantifying the potential benefits to public health and well-being from Europe's blue spaces. BMJ Open, 2017, 7(6): e016188.

[31] Rugel EJ, Henderson SB, Carpiano RM, et al. Beyond the Normalized Difference Vegetation Index (NDVI): Developing a Natural Space Index for population-level health research. Environ Res, 2017, 159: 474-483.

[32] Wendelboe-Nelson C, Kelly S, Kennedy M, et al. A scoping review mapping research on green space and associated mental health benefits. Int J Environ Res Public Health, 2019, 16(12): 2081.

[33] Kabisch N, van den Bosch M, Lafortezza R. The health benefits of nature-based solutions to urbanization challenges for children and the elderly - A systematic review. Environ Res, 2017, 159: 362-373.

[34] Houlden V, Porto de Albuquerque J, Weich S, et al. A spatial analysis of proximate greenspace and mental wellbeing in London. Appl Geogr, 2019, 109: 102036.

[35] Dempsey S, Lyons S, Nolan A. Urban green space and obesity in older adults: Evidence from Ireland. SSM Popul Health, 2018, 4: 206-215.

[36] Sun T, Yang J, Li J, et al. Enhancing Auto Insurance Risk Evaluation with Transformer and SHAP. IEEE Access, 2024.

[37] Li J, Fan L, Wang X, et al. Product Demand Prediction with Spatial Graph Neural Networks. Applied Sciences, 2024, 14(16): 6989.

[38] Liu M, Ma Z, Li J, et al. Deep-Learning-Based Pre-training and Refined Tuning for Web Summarization Software. IEEE Access, 2024.

[39] Chen X, Liu M, Niu Y, et al. Deep-Learning-Based Lithium Battery Defect Detection via Cross-Domain Generalization. IEEE Access, 2024.

[40] Wang X, Wu YC, Ji X, et al. Algorithmic discrimination: examining its types and regulatory measures with emphasis on US legal practices. Frontiers in Artificial Intelligence, 2024, 7: 1320277.

[41] Wang X, Wu YC, Ma Z. Blockchain in the courtroom: exploring its evidentiary significance and procedural implications in US judicial processes. Frontiers in Blockchain, 2024, 7: 1306058.

[42] Ma Z, Chen X, Sun T, et al. Blockchain-Based Zero-Trust Supply Chain Security Integrated with Deep Reinforcement Learning for Inventory Optimization. Future Internet, 2024, 16(5): 163.

[43] Wang X, Wu YC, Zhou M, et al. Beyond surveillance: privacy, ethics, and regulations in face recognition technology. Frontiers in big data, 2024, 7: 1337465.

[44] Wang X, Wu YC. Balancing innovation and Regulation in the age of generative artificial intelligence. Journal of Information Policy, 2024, 14.

[45] Zuo Z, Niu Y, Li J, et al. Machine Learning for Advanced Emission Monitoring and Reduction Strategies in Fossil Fuel Power Plants. Applied Sciences, 2024, 14(18): 8442.

[46] Asif M, Yao C, Zuo Z, et al. Machine learning-driven catalyst design, synthesis and performance prediction for CO2 hydrogenation. Journal of Industrial and Engineering Chemistry, 2024.

RESEARCH ON THE SERVICE MODEL OF INTELLIGENT READING PROMOTION OF RED LITERATURE IN THE METAVERSE PERSPECTIVE

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Abstract: Exploring the service model of red literature reading promotion in the metaverse perspective, and promoting new development of intelligent reading promotion. The logic of integration between the metaverse and red literature is analyzed, and four aspects of 'Digital and Intellectual Fusion' are proposed to enable smart reading promotion, including promotion technology, promotion content, promotion services and reading experience. Smart reading promotion has changed from the traditional resource-based content-based to demand-based openness, driving the evolution of reading methods into autonomy, precision and adaptiveness. In the context of the metaverse, based on the analysis and excavation of promotion subjects, reading carriers and platforms, and reading ecosystem promotion elements, four promotion service models are proposed to provide countermeasures and guidelines for the promotion of intelligent reading.
Keywords: Metaverse; Red Literature; Reading promotion; Service model

1 INTRODUCTION

Red literature is an important carrier for passing on the red gene was raised in the 19th National Congress report explaining cultural self-confidence. In the new era, the reading and promotion of red literature is of great significance in enhancing the people's sense of national historical identity, spreading the advanced theories of the CPC, passing on and carrying forward the spirit of the revolution, and fostering socialist core values [1].

Under the technological wave of the new round of information revolution, metaverse as an emerging concept and cutting-edge technology has received extensive attention. The development of metaverse is both an opportunity and a challenge for the promotion of reading. The reason is that on the one hand, technological changes have brought innovations and promoted the development of digital economy and industrial upgrading, but on the other hand, the fusion, reform and reorganization of many technologies have led to the dilemma that reading promotion is faced with the difficulties of adapting the promotion methods, technologies and environments to today's technological pattern and the whole reading ecology. Therefore, what academics need to pay attention to is how to accelerate the intelligent upgrading of the information service industry through the integration of metaverse technology and reading promotion so as to stimulate readers' interest in reading and guarantee their basic ability to read and obtain information [2].

2 CURRENT STATUS OF DOMESTIC AND INTERNATIONAL RESEARCH ON THE PROMOTION OF READING OF RED LITERATURE

Intelligent reading and promotion of red literature plays a vital role in spreading the Chinese spirit, Chinese values and passing on the red spirit, and to a certain extent, it also promotes the development of the cultural industry. The reading promotion of red literature has attracted extensive attention from scholars at home and abroad, but due to the special characteristics of red literature, foreign scholars have relatively few research results on it. The research on the promotion of reading red literature in China mainly focuses on the following three aspects: ① the practice and thinking of regional libraries in promoting the reading of local characteristic red culture. The construction of red reading promotion system in college libraries. ③Research on the promotion strategy of red literature under specific background. The research on the promotion of foreign translation of red literature is divided into three periods: germination, exploration and surge. The research content is mainly from the translation science, based on multiple perspectives to explore the translation strategy of the red text: ① red culture and translation science ② red culture translation and the ideological and political construction of the curriculum ③ translation science perspective of the red culture and tourism external promotion. Through combing the research results in the field of red literature, it is found that, whether it is internal promotion or external translation, there is a relative lack of attention to the reading and promotion service mode of red literature based on the metaverse background and led by new technology, and there are fewer related research results, and the breadth and depth of the research are insufficient. In view of this, this paper summarizes the logic of integration of red literature and metaverse based on the attributes of red literature and metaverse, analyses how "Digital and Intellectual Fusion" empowers the realization of reading promotion of red literature in the perspective of metaverse, and designs a service model of intelligent reading promotion, so as to accelerate the construction of an ecosystem of intelligent reading [3].

3 LOGICAL EXTRAPOLATION OF THE PROMOTION OF INTELLIGENT READING OF RED LITERATURE IN A METAVERSE CONTEXT

The purpose of combining the metaverse and red literature reading promotion is to try to create a new knowledge creation, management and service ecosystem that integrates reality and reality. This ecosystem is a form of reading promotion service that is mainly characterized by immersive interactive experience, multifaceted collaborative content production, spatial interaction between the real and virtual worlds, and intelligent reading of 'Red Literature-Knowledge-People'[4].

3.1 The Driving Force of the Metaverse is Similar to That of the Red Literature Reading Promotion

The metaverse has a huge information ecology. This is mainly reflected in the fact that cloud computing lays a solid foundation of arithmetic power and data mining supports the transformation of information value. Cloud computing with dynamic distribution of arithmetic power is the basic guarantee of the metaverse [5]. The red literature reading promotion service also follows the data-driven research paradigm. Red literature reading promotion service is based on different nationalities, cultures and social backgrounds to analyze the readers' behavioral data and feedback data from the perspective of geo-analysis, and discover the potential reading needs and preferences. And accordingly push the corresponding potential resources for them [6]. Metaverse and reading promotion share the same driving force ,that is ′data′. This enables the two to continuously integrate and intersect, and will create an intelligent reading promotion service environment where everything is intelligent [7].

3.2 Metaverse Cracking the Red Literature Reading Promotion Attribute Puzzle

The metaverse will inherit and develop the characteristics of the electronic communication era, and time and space will no longer be the main elements [8]. This cracks the attribute problem of inconvenient access to articles due to the dispersion and disorder of red literature. At the same time, it will further extend the identification of readers' needs and their experiences, making their knowledge acquisition methods richer and their information dissemination capabilities more efficient. Metaverse technology enjoys the immersive experience of spatiotemporal interactivity through immersive experience devices with visual, auditory, and tactile senses, allowing readers to freely choose interaction objects and communication methods in real and virtual scenes [9]. This makes the problem of red literature being highly theoretical, obscure and difficult to read, and lacking in interestingness solved, bringing readers psychological and physiological immersion [10], and obtaining a different cognitive and emotional experience.

3.3 The Spirit of Red Literature Gives Soul to the Development of the Metaverse

The era of the metaverse has irreversibly come, its future as a new social form and way of life, through the extended reality technology for us to bring a convenient and real sense of interactive experience, but the development of science and technology is always human-centered as a starting point, and more need to be in the content level, the spirit of the level of the construction and improvement. As the great spirit of the recorders of the red literature, for the motherland and the people's cause to make selfless contributions to the great revolutionary spirit for the reality of the foundation, relying on the red literature entity for its injection of the source [11]. Realization of virtual reality interaction, red literature will certainly bring excellent content and reality bearing and excellent spiritual culture for the metaverse, forming a way of development with Chinese cultural values [12].
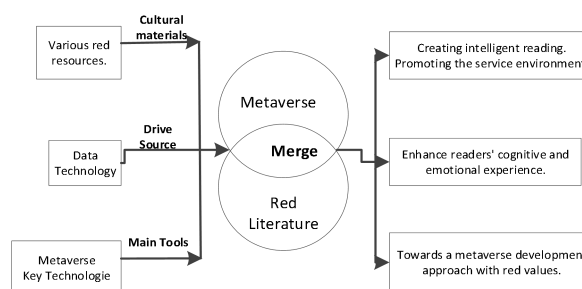
Figure 1 Mechanism of convergence between metaverse and red literature reading promotion

4 THE REALIZATION OF INTELLIGENT READING PROMOTION OF RED LITERATURE IN METAVERSE PERSPECTIVE BY 'DIGITAL AND INTELLECTUAL FUSION'

The purpose of "Digital and Intellectual Fusion" in the field of reading promotion is to learn red ideas and enhance the spirit of patriotism [13]. Based on the fusion of red big data and artificial intelligence, using data mining, language processing and other advanced technologies, to build a dynamic virtual model that maps the physical space and digital space of the red literature in both directions, so that readers and translators can enter into an immersive experience through their personal identity attributes. 'Digital and Intellectual Fusion' is a new development concept for

future-oriented reading promotion, the core of which lies in the fusion and application of various "Intelligent Technologies" [14]. 'Digital and Intellectual Fusion' inspires 'Reader Intelligence' with 'Technical Intelligence', fuses digital space with intelligent space, breaks the traditional purely physical reading space, and builds an intelligent reading service model [15].

4.1 Technology First, Enjoy the Feast of Technology for Promoting Intelligent Reading

Specifically, the reading promotion of red literature in the era of metaverse relies on various kinds of equipment such as cloud computing center, edge computing center and cloud-based architecture to order and visualize the key data of red literature, and process, repair, transform and integrate them [16]. At the same time, special red semantics and scenarios are processed, which are no longer unfolded in the form of text, pictures, sounds, etc., but promote the interaction of information in the metaverse by establishing a direct communication and control channel between the brain and the external devices, and bring the readers a new experience of intelligent reading [17].

4.2 Content-Based, Customized Reading Promotion Personalized Service Content

Due to the long time, the content of red literature is detached from the times, thus it is difficult for readers to get emotional resonance [18]. Intelligent reading, on the other hand, is based on digital, informational and intelligent information technology, with interconnection, efficiency and convenience as the main features, based on reading behavior and reading cloud data with algorithms repeatedly calculated and matched. It not only mines behavioral data, cleans, classifies and filters reading preferences, duration, scenes and readers' beliefs and values, cultural background and social psychology, etc., but also mines the connotative value of red literature and produces content according to demand by using metaverse technology, which truly realizes personalized and customized reading.

4.3 Service Oriented, Building a New Intelligent Reading Promotion Ecology

The association and sharing of red resources is an important guarantee that reading promotion can be maximized. Red literature presents such characteristics as dispersion and fragmentation, and readers need to read a large number of literature if they want to obtain comprehensive information [19]. Under the environment of metaverse technology, different kinds of resources are classified and processed through semantic analysis technology and corresponding category labels are generated, so as to establish the connection between resources and achieve the structured processing of red information. Eventually, the corresponding literature extension service is provided to help readers establish the knowledge service system and achieve the optimization of reading experience. At the same time, the access to red resources becomes more diversified, a virtual network communication space is established, and readers are able to collide with each other based on their own knowledge stock, break through the constraints of traditional reading, and build a reading ecology of value, rationality, and practical intelligent reading [20].

4.4 Experience-Focused, Immersive Reading Promotion

Intelligent reading promotion is not only the dissemination of information, but also a service driven by readers' reading experience. Based on readers' personal experience, it puts them in the reading situation, and uses metaverse technology to fully mobilize readers' sensory stimulation and emotional stimulation, so that they can produce emotional resonance [21]. At the same time, it promotes readers to form a new understanding of red literature, and proceeds to make red culture related products, establishes the association with red literature, and finally makes red culture integrated into readers' life.
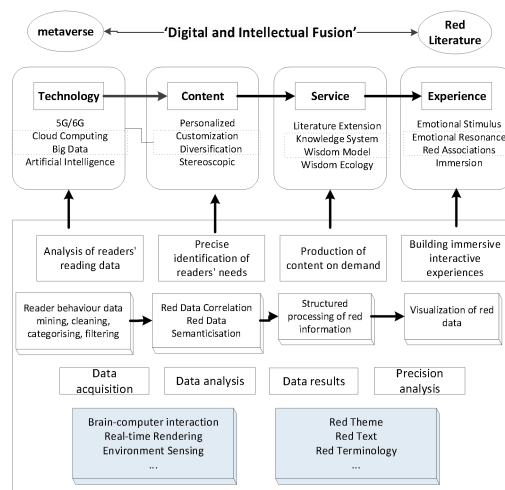

Figure 2 'Digital and Intellectual Fusion' Empowerment Model of Red Literature Reading Promotion Service

5 RED LITERATURE INTELLIGENT READING PROMOTION SERVICE MODEL IN METAVERSE PERSPECTIVE

Intelligent reading promotion of red literature in the context of metaverse has changed the fragmented reading mode of readers, inherited and updated e-reading, and paid more attention to emotional and social reading, and the intelligent reading promotion service should also be improved in various aspects such as reading carriers, promotional subjects, and the creation and learning of knowledge [22].

5.1 Enhancing the Efficiency of Reading Carriers and Broadening the Horizons of Global Promotion of Red Literature

With the help of new technology, we should fully mobilize the tools of new carriers, improve the efficiency of reading carriers, and make good use of both internal promotion and external translation, so as to make the dissemination of red culture smoother.

Internal promotion. Red literature intelligent reading as a new type of reading to promote the spirit of the revolution, according to the characteristics of red literature attributes, the use of new technology will red literature content and scenarios reproduced, so that the red culture live‑up [23]. Let the reading form from plane to three-dimensional, so that the reader immersive experience to feel the red spirit. At the same time, based on the encryption algorithm of blockchain technology, using its asymmetric encryption advantage to identify and meet the personalized knowledge needs of different groups of users, so that the reading of red literature is more in line with the big data era.

External translation. With the wide application of new technologies and modes of metaverse oriented to 5G+IoT in reading promotion, the translator is placed in a specific spatial and temporal situation, selectively adopts the original text information, deconstructs the original text scenarios and narrative perspectives by means of reconstruction, and carries out the scenario selection and setup, so as to deepen the readers' understanding of the red literature. At the same time, relying on cloud computing technology, we can rapidly build a customized machine translation system for red literature, achieve offline access across devices and systems, and obtain translations of red literature in various languages through data computing and provide them to readers [24].

5.2 Creating a Dual Mutual Knowledge Co-creation Community, Crossing the Boundary of Intelligent Reading of Red Literature

There will be a great breakthrough in the way of knowledge exchange in the context of the metaverse. Readers of existing virtual exchange communities can generally communicate only through the form of text, with a low sense of spatial immersion and a single mode of interaction [25]. Under the role of metaverse, the virtual communication platform will become a real sense of "community".

Space sharing. Under the background of the metaverse, a red digital reading community is built based on high technology to help readers understand red culture in multiple ways and in all directions [26]. Everyone in the community has a ʹprivate areaʹ, readers can freely choose and obtain the corresponding knowledge, and there is a corresponding public space outside the private area. In the public space can be held in the red virtual classroom, red academic conferences and other activities, providing community users with a variety of knowledge interaction space.

Resource sharing. Using metaverse technology to reconstruct knowledge to reduce the loss and deviation in the process of knowledge integration, users enter the community and immerse themselves in the scenario in the form of three-dimensional unfolding, experiencing the most complete process of knowledge generation, and absorbing their spiritual culture in a precise and immersive way.

Knowledge co-creation. The value of reading focuses on the creation and production of knowledge. Each participant in the community is not only a reader but also a creator. Breaking down the barriers between different industries, technologies and cultures, this learning method forms a decentralized, multi-dimensional, shared "embedded" cognitive network [27]. Subverting the traditional way of knowledge production, gradually evolving the interconnection of human ideas, to ensure the effective dissemination of knowledge of red literature.

5.3 Cross-Border Co-operation for Intelligent Reading Promotion and Establishment of Multi-Channel Dissemination Mechanism for Red Literature

The main body of reading promotion in the context of the metaverse is gradually becoming more three-dimensional, with greater emphasis on the synergistic promotion of multiple subjects.

"Family" linkage. The influence of family education has a deep impact on the reading promotion of red literature. Driven by the family community, the construction of red literature immersive experience physical space, equipped with the necessary equipment, with the help of metaverse technology to form "online + offline" intelligent reading promotion mode, activate the red spirit inherited from the red literature, to strengthen the function of ideological education, breaking through the traditional cross-border mode [28].

"Celebrity" driven. Reading promotion is not only through digital dissemination, but also the establishment of government funding, cultural promotion and celebrity effect. The importance of cultural communication with the help of celebrity effect is becoming increasingly obvious. Interpretation of the red story in the form of celebrity

interpretation, presented in the form of short videos to cater for the public's habit of receiving information in the metaverse era, to understand the spirit of China at any time and any place.

5.4 Improving the Intelligent Reading Ecosystem and Forming a Closed Loop of National Reading of Red Literature

Smart technology should also focus on humanistic feelings. The intelligent reading ecosystem embodies the equality of all people, and at the same time contains humanistic feelings. Intelligent reading can not only focus on the mapping relationship between technology and reading, humanistic values and emotional transmission is also an important part of the promotion of intelligent reading [29].

"Meta-reading+". Breaking down the reading hierarchy to achieve true universal reading. The metaverse intelligent reading scene enhances the presence and identification of the original red literature, uses hyperlink technology, sets up linking channels between different levels, and according to the reader's own cognitive level and comprehension ability, helps the reader to find the most suitable way to read, and can really internalize the red spirit in the heart.

"Barrier-free Reading". On the basis of enriching the reading promotion service for ordinary people, it also pays attention to the promotion service for special people. Relying on the interactive intelligence capability of Metaverse, integrating multi-modal interaction technology, using machine translation, voice recognition and natural language understanding and other technologies, the red literature and red scenes are shared through the immersive resources of Metaverse, multi-sensory experience, transforming visualization into perceptibility, opening up the "reading blind alley" for people with disabilities, creating a barrier-free reading space, and providing a barrier-free reading space for people with disabilities. The Centre will open up the "blind reading path" for the disabled, create a barrier-free reading space, and facilitate the reading of the disabled [30].
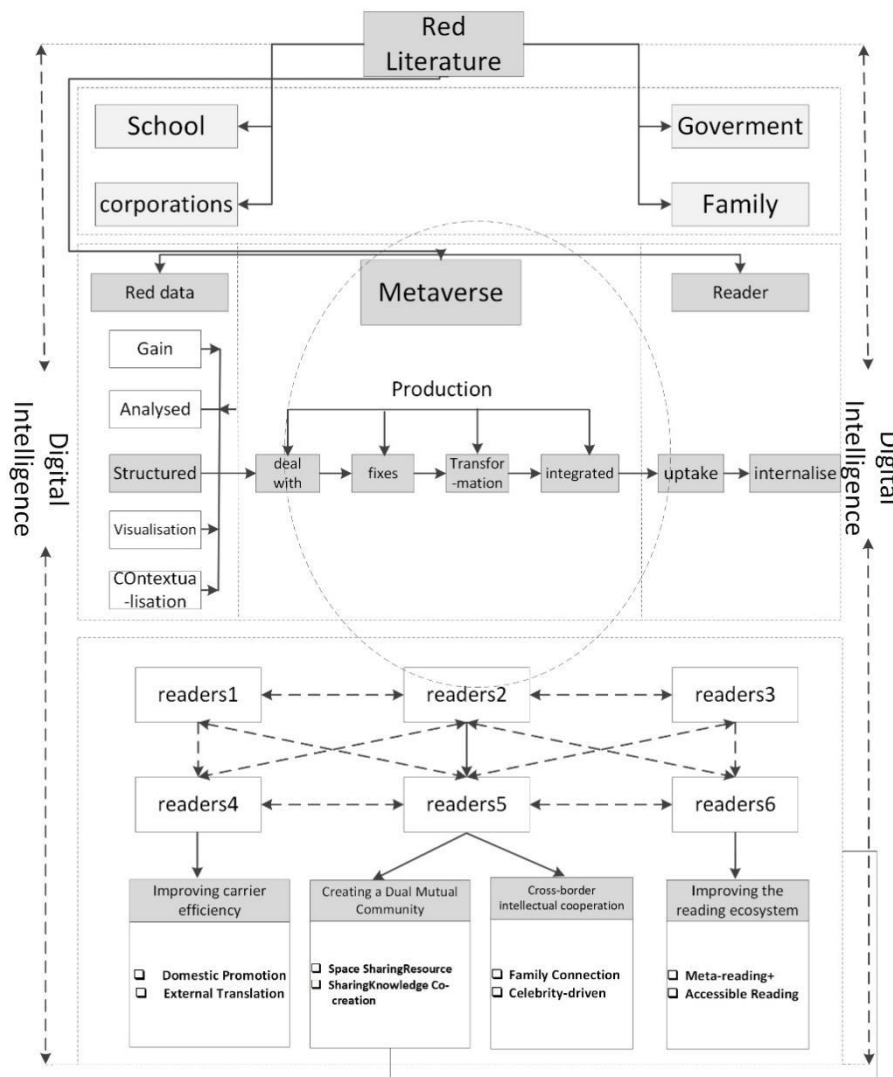

Figure 3 Red literature intelligent reading promotion service model under the metaverse perspective

6 CONCLUSION

The emergence of the metaverse has brought new ideas for the change of intelligent reading promotion. Although the application of metaverse technology is not common at this stage, with the continuous progress of science and

technology and the continuous development of people's thinking concepts, the metaverse will exist in the form of a mature digital network and gradually integrate into people's daily life [31]. Metaverse technology is integrated into the promotion of intelligent reading, and "Digital and Intellectual Fusion" empowers it to eventually form an intelligent reading ecosystem for red literature, and to achieve this goal, it is necessary to explore and study the whole system, rules, processes and other aspects of the metaverse.

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REFERENCES

[1]   Rezk, E, Haggag, M, Eltorki, M, et al. A comprehensive review of artificial intelligence methods and applications in skin cancer diagnosis and treatment: Emerging trends and challenges. Healthcare Analytics, 2023, 4, 100259. DOI: https://doi.org/10.1016/j.health.2023.100259.

[2]   Gandhi, M, Gaur, A, Kar, AK, et al. Crafting user experiences in the metaverse: A design science study. Technological Forecasting and Social Change, 2024, 209, 123759. DOI: https://doi.org/10.1016/j.techfore.2024.123759.

[3]   Wang, L, Shi, X, Liu, C, et al. Innovation and Effect Evaluation Algorithm of Library's Refined Reading Promotion Activities in the 5G Era. Frontiers in Educational Research, 2024, 7(5). DOI: 10.25236/FER.2024.070525.

[4]   Claire, L, Luke, T. Libraries and the metaverse: The rise of augmented and virtual realities. Business Information Review, 2023, 40(4): 156-157. DOI: 10.1177/02663821231216772.

[5]   Ayodeji YA, Tega RE, David, BO, et al. Reincarnation of libraries via metaverse: A pathway for a sustainable knowledge system in the digital age. Business Information Review, 2023, 40(12): 191-197. DOI: 10.1177/02663821231208044.

[6]   Tella A, Ajani AY, Ailaku VU. Libraries in the metaverse: the need for metaliteracy for digital librarians and digital age library users. Library Hi Tech News, 2023, 40(8): 14-18. DOI: 10.1108/LHTN-06-2023-0094.

[7]   Anna VEN, Harisanty D, Ismail N. Libraries on metaverse, do they exist? Library Hi Tech News, 2023, 40(6): 1-2. DOI: 10.1108/LHTN-02-2023-0019.

[8]   Adigun OG, Ajani AY, Enakrire TR. The Intelligent Libraries: Innovation for a Sustainable Knowledge System in the Fifth (5th) Industrial Revolution. Libri, 2024, 74(3): 211-223. DOI: 10.1515/LIBRI-2023-0111.

[9]   Kalbande D, Yuvaraj M, Verma KM, et al. Exploring the Integration of Artificial Intelligence in Academic Libraries: A Study on Librarians'Perspectives in India. Open Information Science, 2024, 8(1): 20240006. DOI: 10.1515/OPIS-2024-0006.

[10] Peipei C, Lin Y. Research on Strategies for the Aging Population in the Intelligent Digital Library of Wenzhou City under the All-Age Friendly Concept. Scientific and Social Research, 2024, 6(8): 1-8. DOI: 10.26689/SSR.V6I8.7653.

[11] Peter F. "Through the looking glass: envisioning new library technologies" musing on artificial intelligence and accessibility. Library Hi Tech News, 2024, 41(6): 1-5. DOI: 10.1108/LHTN-06-2024-0095.

[12] Yang G. Research on the Strategy of Building Intelligent Services in College Libraries under the Background of Big Data. Probe - Media and Communication Studies, 2024, 6(2). DOI: 10.59429/PMCS.V6I2.6491.

[13] Adigun OG, Ajani AY, Enakrire TR. The Intelligent Libraries: Innovation for a Sustainable Knowledge System in the Fifth (5th) Industrial Revolution. Libri, 2024, 74(3): 211-223. DOI: 10.1515/LIBRI-2023-0111.

[14] Baek, J, Hwang, Y. Old tales, new tools: How AI chatbots and the metaverse are transforming premodern classical literature reading activities. International Journal of Educational Research, 2024, 128, 102461. DOI: https://doi.org/10.1016/j.ijer.2024.102461.

[15] Adeleke, AA, Durodolu, OO. Trends in Library and Information Services. In Reference Module in Social Sciences. Elsevier. 2024. DOI: https://doi.org/10.1016/B978-0-323-95689-5.00157-7.

[16] Han, Qing-Long. The era of quality and metaverse. IEEE/CAA Journal of Automatica Sinica, 2023, 10(1): 1-2. DOI: https://doi.org/10.1016/j.asoc.2024.111906.

[17] Miccoli, L, Arias, MÁP, Santiago, J. A network analysis on digital media use, reading enjoyment, and orthography precision in a highly educated sample. Computers & Education, 2023, 207, 104932. DOI: https://doi.org/10.1016/j.compedu.2023.104932.

[18] Smith, C. Smart Libraries and Library 3.0. In Reference Module in Social Sciences. Elsevier. 2024. DOI: https://doi.org/10.1016/B978-0-323-95689-5.00017-1.

[19] Jadhav, D, Shenoy, D. Measuring the smartness of a library. Library & Information Science Research, 2020, 42(3): 101036. DOI: https://doi.org/10.1016/j.lisr.2020.101036.

[20] Ramirez, EM. The Future of Reading and its Promotion. In Reference Module in Social Sciences. Elsevier. 2024.

DOI: https://doi.org/10.1016/B978-0-323-95689-5.00082-1.

[21] Kristensen, MM, Simonsen, P, Lei Pihl, ME, et al. "We're opening 20 doors!": Exploring the collective dimensions of Shared Reading as mental health promotion among newly retired men in Denmark. Social Sciences & Humanities Open, 2023, 8(1): 100639. DOI: https://doi.org/10.1016/j.ssaho.2023.100639.

[22] Ylipulli, J, Pouke, M, Ehrenberg, N, et al. Public libraries as a partner in digital innovation project: Designing a virtual reality experience to support digital literacy. Future Generation Computer Systems, 2023, 149, 594-605. DOI: https://doi.org/10.1016/j.future.2023.08.001.

[23] Ihekwoaba, EC, Okwor, RN, Uzowulu, OO. Access Provision for Students with Reading Disabilities (SRDs) in Nigerian University Libraries. The Journal of Academic Librarianship, 2023, 49, 102622. DOI: https://doi.org/10.1016/j.acalib.2022.102622.

[24] Donovan, JM. Keep the books on the shelves: Library space as intrinsic facilitator of the reading experience. The Journal of Academic Librarianship, 2020, 46, 102104. DOI: https://doi.org/10.1016/j.acalib.2019.102104.

[25] F Wilfrid Lancaster, Warner AJ. Intelligent Technologies in Library and Information Service Applications. Information Today, 2001. DOI: https://doi.org/10.1016/S0098-7913(01)00163-0.

[26] Chen, H. Application of E-Learning entertainment learning based on intelligent interactive experience in English reading assistance mode. Entertainment Computing, 2025, 52, 100762. DOI: https://doi.org/10.1016/j.entcom.2024.100762.

[27] Smith, C. Smart Libraries and Library 3.0. In Reference Module in Social Sciences. Elsevier. 2024. DOI: https://doi.org/10.1016/B978-0-323-95689-5.00017-1.

[28] Tella, A, Ukwoma, SC, Kayode, AI. A two models modification for determining cloud computing adoption for web-based services in academic libraries in Nigeria. The Journal of Academic Librarianship, 2020, 46, 102255. DOI: https://doi.org/10.1016/j.acalib.2020.102255.

[29] Khatib, MME, Opulencia, MJC. The Effects of Cloud Computing (IaaS) on E- Libraries in United Arab Emirates. Procedia Economics and Finance, 2015, 23, 1354-1357. DOI: https://doi.org/10.1016/S2212-5671(15)00521-3.

[30] Yin, Z, Zhang, Z, Ren, T. Beyond surface: Chinese youth's digital reading motivation explored via laddering and the interpretative structural modeling method (ISM). Library & Information Science Research, 2024, 46, 101314. DOI: https://doi.org/10.1016/j.lisr.2024.101314.

[31] Chen, X, Xiao, Y. Pathways to digital reading literacy among secondary school students: A multilevel analysis using data from 31 economies. Computers & Education, 2024, 218, 105090. DOI: https://doi.org/10.1016/j.compedu.2024.105090.

THE ANALYSIS OF ENTERPRISE OPEN INNOVATION PLATFORM CONSTRUCTION AND MANAGEMENT MODE IN THE ERA OF DIGITAL ECONOMY

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Abstract: This study aims to explore the construction and management models of enterprise open innovation platforms in the era of the digital economy and analyze their impact on innovation efficiency and outcomes. Through a literature review and theoretical analysis, the study summarizes the design principles, technological architecture, and management models of open innovation platforms. The results show that the construction of enterprise open innovation platforms relies on clear strategic positioning and scalable technological architecture. Successful platforms require a clear definition of participants' roles and partnerships to ensure synergy among innovation agents. The study concludes that data-driven management models and a balance between openness and control are crucial for the effective operation of the platform. This paper provides theoretical support and practical guidance for enterprises to implement innovation strategies in the context of the digital economy.

Keywords: Open innovation; Digital economy; Platform construction; Management model; Data-driven; Innovation efficiency

1 INTRODUCTION

The rise of the digital economy, especially the rapid development of big data, cloud computing, artificial intelligence and other technologies, has changed the global business environment and Enterprise Innovation model. The traditional closed innovation model has been unable to meet the rapid changes in market demand and the speed of technological change, the open innovation model emerged[1]. The open innovation not only emphasizes the integration of internal resources but also maximizes innovation outcomes by building a platform to absorb external ideas, technology and resources[2]. With the rapid development of these technologies, the open innovation platform provides an effective tool for enterprises to integrate internal and external resources.

In the era of digital economy, enterprises face not only the rapid iteration of technology, but also the fierce competition from the global market. The open innovation provides a flexible and efficient innovation path that enables firms to leverage external resources for knowledge creation and technological innovation[3]. Open innovation platforms not only effectively connect companies, research institutions, suppliers and customers, but also foster synergy and efficiency in innovation through the sharing and analysis of real-time data[4]. This enables enterprises to identify market needs more quickly, mobilize external resources, and accelerate product development and innovation. These platforms extend the boundary of innovation by digital means and break the limitation of traditional enterprise organization structure to innovation.

To raise the open innovation performance of enterprises and achieve sustainable development, we propose three research questions: (1) how do enterprises build open innovation platforms in the context of the digital economy? (2) how does the management mode of open innovation platforms affect innovation efficiency and results? (3) how do enterprises achieve a balance between openness and control in platform management?

This thesis focuses on how enterprises construct and manage open innovation platforms in the era of digital economy. By analyzing the design principles, technology architecture and management models of open innovation platforms, this paper reveals how enterprises can enhance their innovation capabilities through platform collaboration and data-driven. At the same time, the paper will explore how to balance the relationship between resource opening and core competence protection in the process of open innovation.

This research has important theoretical and practical significance. On the one hand, the discussion of these issues will not only help deepen the application of open innovation theory in the context of the digital economy, but also provide theoretical support and practical guidance for enterprises to implement innovation strategies in practice. For companies, on the other hand, open innovation platforms not only facilitate access to external resources and technologies, but also reduce innovation costs, increase innovation speed and market responsiveness. At the same time, a rational management model ensures that companies retain control over core technologies and protect their competitive advantage while opening up partnerships[5].

2 LITERATURE REVIEW

2.1 The Origin and Evolution of Open Innovation

Chesbrough (2003)first proposed the concept of open innovation, which challenges the traditional closed innovation model and emphasizes that enterprises should not only rely on internal resources, but also actively integrate external

resources to promote the innovation process[1]. According to this theory, companies are no longer confined to in-house R & D, but are using open innovation platforms to maximize the value of innovation by combining the knowledge and capabilities of external partners[2]. The core of this innovation model is to break the traditional innovation boundary, so that enterprises can be more flexible and more efficient to respond to the fast-changing market demand.

The evolution of open innovation follows two main patterns: fission and fusion. Under the fission model, firms create new innovation units or businesses by separating their core business from their innovation resources in order to quickly capture new needs in the market[6]. By contrast, the fusion model emphasizes the cooperation between enterprises and external innovators to realize the integration of internal and external resources, and to promote the scale and systematization of innovation.

Over time, open innovation have evolved from original ideas to important strategies in practice, especially in the context of the digital economy, where they have become more versatile[7]. Through open innovation, companies can obtain new technologies, ideas and even market feedback through external channels, thereby reducing the cost of innovation and shortening the R & D cycle. In addition, there is a growing body of literature suggesting that open innovation can be applied not only to technology-oriented enterprises but also to a wide range of industries[3].

2.2 The Digital Technology's Impact on the Open Innovation Platform

With the rise of digital economy, digital technology has not only changed the production and management of enterprises, but also greatly affected the driving mechanism of innovation. The widespread use of technologies such as digital platforms, cloud computing, and artificial intelligence allows enterprises to share and utilize external knowledge resources more efficiently, greatly increasing the flexibility and openness of innovation[4]. Digital technologies not only enhance the ability of enterprises to respond to market changes, but also accelerate the cooperation between enterprises and external innovators[7]. For example, the rise of open innovation platforms has made cross-border innovation collaborations more common, enabling firms to interact and collaborate with global innovation resources in real time through digital platforms[8].In the healthcare sector, open innovation platforms have also been utilized to enhance educational and collaborative processes. For instance, Wu et al. explored the application of MOOC-based blended teaching models in medical internships, demonstrating how digital platforms can facilitate the integration of external educational resources and promote collaborative learning among students and instructors[9]. This example illustrates the versatility of open innovation platforms beyond traditional business applications, emphasizing their role in fostering knowledge sharing and innovation across various industries.

Digital technologies, particularly big data, artificial intelligence and cloud computing, have given a big boost to open innovation platforms. Nambisan et al points out that the digital economy enables enterprises to integrate global innovation resources through platform models, increasing the scale and collaboration of innovation activities[4]. In particular, digital platforms enable companies to collaborate across regions and industries, obtain real-time market information and customer feedback, and facilitate the efficient operation of open innovation platforms. Digital technology has also changed the nature of innovation collaboration. Not only can companies share resources and information through open platforms, but they can also leverage data analysis tools to optimize innovation processes and increase market responsiveness[10] . This makes the open innovation platform more flexible and adaptable in the digital economy, further enhancing the innovation ability and competitive advantage of enterprises.

2.3 Successful Cases of the Open Innovation Platform

Many companies have successfully applied open innovation platforms in practice. Tesla, for example, continues to improve its autonomous driving technology through its open automotive software system, which engages developers and partners from around the world. In addition, the open platform strategy of Alibaba is a typical example of a platform that can quickly respond to market changes and launch innovative products and services by integrating a large number of external partners[5]. These success stories show that companies can effectively integrate external resources and collaborate on innovation by building open innovation platforms. At the same time, the platform's openness and extensibility enable enterprises to keep the core competitiveness at the same time, rapid capture of innovation opportunities, improve market adaptability [11].

2.4 Open Innovation and Intellectual Property Management

Intellectual Property Management is a key challenge in open innovation platforms. The literature points out that enterprises face the problem of how to balance knowledge sharing and protection in the process of open innovation[3]. Intellectual property protection in open innovation platforms often takes the form of patents, copyrights, contracts and the like, but the application of these tools still requires a delicate balance between openness and control. Companies need to ensure openness in order to attract more outside innovators, but also to avoid the leakage of core technology. In addition, many literature also pointed out that enterprises in the global innovation platform also need to consider the different countries of intellectual property rights protection system. This is particularly important for multinationals, as differences in Intellectual Property Law laws across countries can pose potential risks to innovation collaboration across platforms[6].

3 THEORETICAL ANALYSIS

3.1 The Construction Mechanism of Open Innovation Platform

3.1.1 The framework and design principles of the platform

Building open innovation platform relies first and foremost on clear architectural design and technical support. The literature suggests that companies need to adopt modular design open innovation in order to flexibly adjust the platform's functionality and openness to meet the needs of different innovation projects[5]. The Modular design of the platform not only reduces build costs, but also provides greater flexibility for future technology upgrades and resource integration. In addition, at the technical level, digital technologies such as big data and cloud computing are an important foundation for supporting platform construction[4]. Through the Modular design of the platform architecture, companies can quickly adjust their innovation networks to respond flexibly to changes in the external environment. Unlike traditional closed innovation, the core of open innovation platform is to maintain a degree of openness to engage external partners and innovators for efficient integration and sharing of resources[7].

3.1.2 The roles and relationships of platform participants

In open innovation platforms, the roles and partnerships of different players are crucial. In theory, participants in a open innovation platform typically include the enterprise itself, suppliers, customers, research institutions, universities, and so on[2]. The platform promotes synergy and cooperation among participants through effective interaction mechanisms. The literature points out that when designing and managing open innovation platforms, platform managers need to allocate innovation roles in a rational manner according to the strengths and resource advantages of different participants to ensure the efficient operation of innovation networks [12].

The difficulty in managing these external relationships, however, is how companies balance openness with protection. Knowledge flows among participants are an important force driving innovation, but firms need to protect their core technologies and intellectual property at the same time to avoid misuse or leakage by external players[6]. Therefore, enterprises must establish a clear intellectual property management system to ensure that innovation can be reasonable use, while protecting the core competitiveness of enterprises.

3.1.3 The ecosystem of the platform

The open innovation platform is not only a technology platform, but also a dynamic innovation ecosystem. The literature points out that the success of the platform depends on the construction of an innovation ecosystem composed of multiple participants and the design of effective incentive mechanisms, rules and systems, ensuring the sustainability of innovation ecosystems[5]. Through this innovation ecosystem, enterprises can attract more innovation subjects to participate and promote the platform of continuous innovation.Moreover, integrating multidisciplinary approaches can significantly enhance the effectiveness of open innovation platforms. Pang et al. examined the reform of general medical education based on ideological education concepts, demonstrating how incorporating diverse knowledge systems and interdisciplinary collaboration can lead to more comprehensive and sustainable innovation outcomes[13]. This aligns with the notion that open innovation platforms benefit from the inclusion of varied perspectives and expertise, thereby fostering a more robust innovation ecosystem.An ecosystem-based open innovation platform emphasizes deep collaboration and collaborative innovation among different innovation actors. Participants play different roles in the platform and share innovative resources and results. Apple's App Store, for example, is a open innovation ecosystem in which developers innovate through the tools and rules provided by the platform, and Apple manages and coordinates those innovations, ensure the platform runs efficiently and the innovation ecosystem continues to grow healthily[2].

3.2 The Management Pattern of Open Innovation Platform

3.2.1 Data-driven management mode

In the era of digital economy, data has become the core tool for managing open innovation platforms. Through technologies such as big data and artificial intelligence, enterprises can monitor innovation activity on the platform in real time, analyze the behavior of external actors and market feedback, and thereby dynamically adjust the innovation process[4]. This data-driven Management model enables enterprises to better control the progress of open innovation, identify potential innovation opportunities or problems, and respond quickly. A data-driven management model not only helps to optimize the innovation process but also improves the accuracy and efficiency of innovation. By analyzing the huge amount of data generated on the platform, enterprises can accurately predict market demand and technology trends, reducing innovation uncertainty and risk[10]. In addition, a data-driven management model enhances the transparency of the platform and promotes trust and collaboration among innovation participants. In addition to technological integration, targeted interventions based on data analysis are crucial for optimizing innovation processes. Cui and Yang investigated the effects of nursing interventions on stress and emotional states in children with scoliosis, demonstrating how data-driven strategies can effectively improve patient outcomes[14]. Furthermore, the integration of diverse data sources is essential for comprehensive innovation management. Huang et al. studied the relationship between traditional Chinese medical diagnostic categories and clinical observations such as tongue and gastroscopic images, illustrating the importance of combining multiple data streams to achieve a holistic understanding. Similarly, open innovation platforms benefit from integrating various data types to enhance decision-making processes and support multifaceted innovation strategies[15].

3.2.2 A balance of openness and control

One of the biggest challenges in managing open innovation platforms is striking a balance between openness and control. The advantage of open innovation is the ability to diversify and collaborate widely on innovation activities through open resource sharing and knowledge flows[3]. But at the same time, companies need to ensure that core technologies and sensitive information will not be abused or leaked, which requires the platform has a certain control mechanism.

Theoretical analysis shows that enterprises can ensure the security of the platform through legal means (such as patents, IP protection agreements) and technical means (such as encryption technology, rights management)[6]. In addition, management should design clear rules and processes to ensure that the core resources and technological advantages of the enterprise are not compromised while opening up [16]. Successful examples of balancing openness and control include Tesla's open patent strategy, which allows outside firms to use their patented technology while ensuring that the long-term interests of the firm are not compromised through laws and contracts.

4 CONCLUSION

4.1 The Path to Build the Enterprise Open Innovation Platform

Based on the analysis of the construction and management models of open innovation platforms in the digital economy era, this study summarizes several key paths. First, the open innovation platform relies on a clear strategic positioning and a modular technology architecture. Enterprises must choose appropriate open innovation models according to their own market needs and technological development directions to ensure that the platform can integrate external resources and effectively collaborate with internal innovation systems[1]. Digital technologies provide powerful data processing and collaboration capabilities for platforms, and companies can leverage technologies such as big data and artificial intelligence to adjust innovation strategies in real time and accelerate the marketization of innovation outcomes [4].

Second, successful open innovation platforms need to clearly define the roles and partnerships of participants to ensure synergy among the innovators. By building an innovation ecosystem that includes external innovators such as suppliers, customers, and universities, firms promote collaborative innovation[2]. This process not only increases the speed of innovation, but also increases the flexibility of enterprises to respond to changes in the market.

4.2 Management Model Optimization Implications

The management model of the open innovation platform is the key to maximizing the value of innovation. The study found that the data-driven management model can significantly improve the platform's innovation efficiency, enterprises through real-time data monitoring and analysis, can quickly optimize the innovation process, and make timely adjustments based on external feedback[10]. In addition, the management model should pay attention to the balance between openness and control. Enterprises need to ensure that core technologies and competitiveness are protected while sharing external resources through intellectual property protection mechanisms and platform rights management[6].

In the practice of innovation, enterprises should establish a flexible and safe management framework, which not only ensures the innovation vitality of open platform, but also controls the risk of innovation activities through rules and processes. The success of the open innovation platform lies in the ability of enterprises to choose appropriate management methods at different levels of openness, maximize the synergy of innovation resources, and protect the long-term interests of enterprises.

4.3 Future Research Directions

This study provides theoretical support for the construction and management of enterprise open innovation platform in the era of digital economy, but there are still some issues worth further exploring in the future. First, open innovation platforms in different industries vary widely in practice, and future research could provide insights into best practices across industries. Secondly, in the context of globalization, cross-border co-operation between open innovation platforms is challenged by different legal and market environments, future studies should further explore how to regulate open innovation activities within the legal frameworks of different countries.

In addition, emerging technologies such as artificial intelligence are likely to have a profound impact on how open innovation platforms are managed as a result of rapid technological development. How these technologies further enhance the security, transparency and efficiency of the innovation platform is an important research direction in the future.

COMPETING INTERESTS

REFERENCES

[1] Chesbrough H. The logic of open innovation: managing intellectual property. Calif Manage Rev, 2003, 45(3): 33-58. DOI: https://doi.org/10.1177/000812560304500301.

[2] West J, Bogers M. Leveraging external sources of innovation: A review of research on open innovation. J Prod Innov Manag, 2014, 31(4): 814-831. DOI: https://doi.org/10.1111/jpim.12125.

[3] Dahlander L, Gann DM. How open is innovation?. Res Policy, 2010, 39(6): 699-709. DOI: https://doi.org/10.1016/j.respol.2010.01.013.

[4] Nambisan S, Lyytinen K, Majchrzak A, et al. Digital innovation management. MIS Q, 2017, 41(1): 223-38.

[5] Chesbrough H, Brunswicker S. A fad or a phenomenon?: The adoption of open innovation practices in large firms. Res Technol Manag, 2014, 57(2): 16-25. DOI: https://doi.org/10.5437/08956308X5702196.

[6] Pisano GP. The hard truth about innovation. Harv Bus Rev, 2019, (1): 62-71.

[7] Bogers M, Zobel AK, Afuah A, et al. The open innovation research landscape: Established perspectives and emerging themes across different levels of analysis. Ind Innov, 2017, 24(1): 8-40. DOI: https://doi.org/10.1080/13662716.2016.1240068.

[8] Von Hippel E. Democratizing innovation: the evolving phenomenon of user innovation. Int J Innov Sci, 2009, 1(1): 29-40.

[9] Wu P, Lan Z, Huang W, et al. Application of a blended teaching model based on MOOCs in undergraduate medical interns. J Youjiang Med Univ Natl, 2020, 42(1): 119-122.

[10] Nambisan S, Wright M, Feldman M. The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. Res Policy, 2019, 48(8): 103773. DOI: https://doi.org/10.1016/j.respol.2019.03.018.

[11] Sedera D, Lokuge S, Grover V, et al. Innovating with enterprise systems and digital platforms: A contingent resource-based theory view. Inf Manag, 2016, 53(3): 366-79. DOI: https://doi.org/10.1016/j.im.2016.01.001.

[12] Abbate T, Codini AP, Aquilani B. Knowledge co-creation in open innovation digital platforms: processes, tools and services. J Bus Ind Mark, 2019, 34(7): 1434-1447. DOI: https://doi.org/10.1108/JBIM-09-2018-0276.

[13] Pang X, Liu F, Li L, et al. A preliminary exploration of the reform of "General Practice Introduction" teaching under the concept of curriculum ideology and politics. J Youjiang Med Univ Natl, 2020, (06): 806-809.

[14] Cui X, Yang M. The impact of nursing interventions based on the Rosenthal effect on stress response and emotional states in children with scoliosis. J Youjiang Med Univ Natl, 2019, 41(06): 713-715.

[15] Huang N, Liu Y, Xu Z, et al. A study on the relationship between TCM syndrome differentiation of peptic ulcer in active phase, tongue diagnosis, and gastroscopic imaging. J Youjiang Med Univ Natl, 2018, 40(05): 466-468, 471.

[16] Wang M, Zhang R, Abdulwase R, et al. The construction of ecosystem and collaboration platform for enterprise open innovation. Front Psychol, 2022, 13: 935644. DOI: https://doi.org/10.3389/fpsyg.2022.935644.

RESEARCH ON THE PATHWAYS AND EFFECTS OF DATA-DRIVEN VALUE CREATION IN ENTERPRISES: A CASE STUDY OF SANY HEAVY INDUSTRY

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Abstract: With the rapid development of information technology, data has become an indispensable core production factor in the era of digital economy. In the context of this era, how enterprises can effectively explore and utilize the value of data elements to promote business innovation and management change has become an important way to enhance the core competitiveness of enterprises and achieve sustainable development. This paper analyzes the effect of data elements driving enterprise value creation of SANY Heavy Industry by using financial performance and non-financial performance, and selects data for a total of 10 years from 2013 to 2023. Through in-depth analysis of SANY Heavy Industry, we find that data elements play a crucial role in the process of enterprise value creation. By deeply mining and applying advanced technologies such as big data and artificial intelligence, SANY Heavy Industry has successfully constructed a data-driven decision support system and intelligent manufacturing system, and realized the intelligent upgrading of production operation, product development, marketing and other aspects. The value of data elements lies in their analysis and application capabilities. Enterprises should establish a perfect data analysis team and mechanism, use advanced data analysis techniques and tools, and dig deep into the laws and trends behind the data to provide a scientific basis for their strategic planning and business decisions.
Keywords: Data elements; Enterprise value; Data-driven; SANY Heavy Industry

1 INTRODUCTION

With the rapid development of information technology, data has become an indispensable core production factor in the era of digital economy. In this era, how enterprises can effectively explore and utilize the value of data elements to promote business innovation and management change has become an important way to enhance the core competitiveness of enterprises and achieve sustainable development. SANY Heavy Industry, as a leader in China's construction machinery industry, has made remarkable achievements in the field of digital transformation in recent years, and its practical experience of utilizing data elements to drive enterprise value creation not only provides valuable insights for the industry, but also provides useful reference for enterprises in other industries.

Against the background of increasingly fierce competition in the global manufacturing industry and the diversification of customer demands, SANY Heavy Industry has deeply realized the importance of data elements for enterprise development. Facing the rapidly changing market environment, the traditional production and management mode has been difficult to meet the enterprise's demand for efficient, precise and flexible development. Therefore, SANY Heavy Industry actively responds to the national strategic plan on the development of digital economy and establishes digital transformation as the core strategy to enhance the competitiveness of the enterprise. By building a comprehensive and perfect data collection, processing, analysis and application system, SANY Heavy Industry has realized the in-depth integration and wide application of data elements in the whole chain of enterprise operations, such as R&D and design, production and manufacturing, supply chain management and customer service. This process not only greatly improves the operational efficiency and market response speed of the enterprise, but also opens up new value growth points for the enterprise, and strongly promotes the transformation and upgrading of the enterprise and high-quality development. Based on this, this study aims to explore how SANY Heavy Industry utilizes data elements to drive the path of enterprise value creation and its actual effect, with a view to providing experience and reference for other enterprises.

In terms of theoretical significance, firstly, it can enrich the theory of data elements to a certain extent, by exploring how data elements affect the enterprise value chain, this study can provide more perspectives and frameworks for the theoretical system of data elements, especially for understanding how enterprises can reshape the process of value creation through the use of data resources and technologies. Second, it can extend the theory of value creation, and this study helps to deepen the understanding of the logic, process and model of value creation, especially in its new form in the context of the digital economy. By analyzing how data technology affects value creation at different stages, it can provide new additions and updates to existing theoretical models of value creation. In terms of practical significance, on the one hand, it enriches policy formulation and adjustment, and the research results can provide empirical analyses and suggestions on the development of the digital economy for management agencies, which can help formulate and adjust relevant policies, optimize the digital economy ecosystem, and promote the healthy and sustainable development of the industry. On the other hand, it can help enhance the competitiveness of enterprises. The research results of the project can help enterprises better understand and cope with the challenges of the digital era, enhance their market competitiveness and achieve long-term development by optimizing the allocation of resources, innovating the business

model, and improving operational efficiency.

2 THEORETICAL FOUNDATIONS

2.1 Technological Innovation Theory

The theory of technological innovation occupies a pivotal position in the field of economics, and was first systematically articulated by Schumpeter in his classic work, The Theory of Economic Development. The concept of "innovation" he proposed refers to the formation of new modes of production by integrating factors and conditions of production in a unique way and introducing them into the production system. This "innovation" covers five key aspects: the development of entirely new products, the application of new production technologies that have not yet been generalized to the industry, the creation of entirely new markets that have not yet been reached, the discovery of new supply channels, and the construction of new organizational models. The neoclassical school takes Solow's Technical Progress and the Aggregate Production Function as an example, and his research shows that from 1909 to 1949, the contribution of technical progress was as high as 88% in the remarkable growth of the total output value of the U.S. manufacturing industry. The institutional innovation school believes in injecting new dynamics into economic growth by reforming the organization or business management of the economy. The national innovation system school, on the other hand, emphasizes that technological innovation is a systematic project, which not only relies on the individual ability of entrepreneurs, but also relies on the overall promotion of the national innovation system. Combined with the current research hotspots, it is not difficult to find that there is an inseparable relationship between data elements and technological innovation. Therefore, future research should pay more attention to technological innovation in the context of data elements, explore its influence mechanism on enterprise performance, and provide strong theoretical support and practical guidance for enterprise development.

2.2 Value Chain Theory

Value chain theory, is the exploration of how a company creates value through a series of specific, interrelated activities. These activities do not exist in isolation, but are closely interconnected and together form a dynamic, value-creating process. It contains a triple meaning, first, the interconnectedness of activities, the activities within the enterprise are closely linked, they influence each other, promote each other, and jointly promote the value growth of the enterprise; second, the multiplicity of value, whether explicit or implicit value, each activity is contributing to the enterprise's unique value; third, the external extension of the value chain, the value chain not only covers the internal activities of the enterprise, it also extends to activities outside the enterprise, such as the network of relationships established with customers, suppliers, etc.

2.3 Value Creation Theory

In the process of exploring enterprise value creation, it is first necessary to clarify a core point, that is, enterprise value creation is mainly embodied in the part of its operating activities to create income over the cost of capital invested by shareholders' capital. With the depth of academic research, the theory of value creation has been continuously enriched and developed. Referring to the value network theory, the concept originated from Slywotzky's insight in 1997, which continued the "customer value-centered" viewpoint of Peter's new value chain theory. However, this theory was further enriched by Prabakar and David in 2001, who not only emphasized the importance of satisfying customers' needs, but also introduced the perspective of suppliers and other stakeholders and the need to create customer value. This theoretical framework contains three core elements: superior customer value, the core competencies of the value network, and the interactions among the members of the value network. Under the value network model, enterprises need to examine their position and role in the value network and think about how to enhance their core competencies. Based on this theoretical background, this paper will conduct an in-depth value creation analysis of the internal and external value chains of enterprises. Through this analysis, we will have a more comprehensive understanding of the value creation activities of enterprises in each link.

2.4 Factor Theory of Production

Factors of production, in short, are all resource inputs that can be used in the production process. In the field of economics, this concept has been interpreted in various ways, but the core idea is the same: they are the resources necessary to drive productive activity. The form and priority of these resources are closely linked to the state of productivity and evolve with the times in a distinctly contemporary and developmental way. From a broad perspective, all intermediate inputs that are not transformed into final use form can be considered as factors of production, which reflects the idea of the expenditure and production approach. Therefore, factors of production are a dynamic concept, whose type, quality and quantity all affect the material creation and product production of society, and are both social and economic in nature. With the restructuring of the economy and society and the development of productive forces and production relations, the composition of factors of production is also expanding. From William Gundry's "two-factor theory", to Say's "three-factor theory", to Marshall's "four-factor theory", and later on, Gao Fuping and Ran Gora proposed the "five-factor theory"[1]. The connotation of factors of production is constantly enriched by the

"five-factor theory" summarized, followed by the "six-factor theory" proposed by Xu Bin and Xu Shoubo[2]. In the era of digital economy, data, as a new production input resource, has expanded the boundary of knowledge creation and has been widely used in the sale of existing goods and the continuous development of new services or products. As a result, data has also been established as a new factor of production.

3 LITERATURE REVIEW

3.1 Data Elements

From the perspective of economics, data as a factor of production has become a much-anticipated research hotspot. With the rapid development of the digital economy era, data plays an increasingly important role in various aspects of production, distribution, exchange and consumption. As a result, theoretical studies and empirical analyses on data production factors have been springing up, attracting the attention of many Chinese and foreign scholars and experts. The theme of "Data, National Accounts and Public Policies" was widely discussed at the 2020 ASSA Annual Forum. Participants had an in-depth discussion on the construction of data value assessment methods and accounting systems, aiming to better understand and quantify the value of data in the economy. At the same time, they also focused on the use of data in the economy, exploring how to more effectively utilize data to drive economic development and policymaking. And at AEA's 2021 Annual Meeting, the use of big data technology in the economy was also at the center of the discussion. As big data technology continues to evolve and spread, its use in the economy is becoming more widespread. Participants had in-depth exchanges and discussions on how big data technology can change the traditional economic model and provide more accurate data support for enterprises and governments, etc. Farboodi and Veldkamp provided a narrow interpretation of data elements, which they defined as information that is encoded as binary sequences and processed and stored in the form of bits. Based on this, a Solow-like growth framework was used for the study and it was found that data elements have a positive effect on increasing productivity[3]. The increase in productivity further attracts more investment, thus expanding the scale of production. This expanded scale of production in turn facilitates the production of more data, creating a process of cyclical data accumulation.Carriere-Swallow and Haksar define data as an economic good, which consists of a string of binary bits and refers specifically to the portion of information that does not contain knowledge and creativity[4]. They point out that data elements have unique characteristics such as non-exclusivity and non-competitiveness, which enable them to match supply and demand in a precise and efficient manner, there by improving the operational efficiency of the macroeconomy and reducing the market failure caused by information asymmetry. Jones and Tonetti share the same viewpoint in this regard, and they argue that the data elements have the zero marginal cost of use The characteristics of the data element. Due to the non-rivalrous nature of data, any number of machines, individuals or firms can use the same data at the same time without reducing the amount of data available to others[5]. As a result, data can lead to productivity gains and exhibit the law of increasing returns to scale. However, Posner and Weyl hold the opposite view ofT this[6]. hey argued that the study found that data elements exhibit increasing marginal returns when invested upfront. However, when the input reaches a certain value, the data factor still follows the law of diminishing marginal returns. Therefore, the overall remuneration of data factors shows a phased form of increasing and then decreasing.

Related research has also received much attention in recent years in China, and in exploring the impact of data factors on production efficiency, Xie Kang et al. started from the perspective of product innovation, and studied in depth how data factors affect the mining of business value and the enhancement of dynamic capabilities of enterprises[7]. Their study found that the input of data factors can significantly expand the productivity of the original production factors and play an important role in improving production efficiency. The publication of relevant literature on data factors in China has only begun to gradually increase in the past two years. The following is a compendium of major studies on data factors by domestic industry and scholars. In terms of the perception of data elements, Kong Yanfang et al. argue that data elements, as the "new oil of the future", have deeply penetrated into the production process in various fields[8]. They emphasize that the use of modern information technology for data collection and activation, and its conversion into 0 and 1 binary symbols can enhance data productivity and make it participate more actively in production activities. Li Zhiguo and Wang Jie suggested that the data factor not only has the same importance as traditional factors such as capital and labor, but also it can improve the established ratio of factor inputs, optimize the allocation efficiency of multidimensional resource factors, and have a significant channeling effect on the improvement of manufacturing productivity[9]. On the other hand, Qi Yudong and Liu Huanhuan , from the perspective of consumer demand, argue that the consumer's induced demand is an important factor in promoting data as a factor of production[10]. At the same time, they emphasize that with the empowerment of digital technology, data, as the digital carrier of information and knowledge in the digital economy era, can further enhance the effectiveness of access to resources and knowledge, thus promoting the high-quality development of productivity.In 2020, the Central Committee of the Communist Party of China (CPC) and the State Council explicitly put forward that the data factor can follow the value reward mechanism of the traditional factors, and leave it to the market to be evaluated and determine its value according to the size of its contribution. This decision further clarified the identity of data as a factor of production, forming the "seven-factor theory" in the era of digital economy. Thanks to the development of modern technology, the value of data factors has become increasingly prominent, and has been compared to the "new oil" and the most important raw material of the twenty-first century.

In summary, data elements have become important factors of production and socialized resources, fully and deeply

involved in value creation. Today's factors of production are characterized by broad connotation, dynamic content, diverse themes and high degree of scarcity, which have a profound impact on the development and reform of society and economy. In this paper, the terms "factors of production" and "factors" will be used synonymously in most cases, unless otherwise specified in specific guidelines.

3.2 Factors Affecting Enterprise Value Creation

For the influencing factors of enterprise value creation, different scholars at home and abroad have different perspectives: by studying A-share listed companies, Yang Qingxiang and Liao Dangtian carried out theoretical analysis and empirical test on the interactive relationship between internal control, technological innovation and value creation ability, and came to the conclusion that technological innovation can enhance the value creation ability of enterprises[11]. Technological innovation can on the one hand increase the knowledge stock of the enterprise, reduce the production cost of the enterprise, and enhance the operating profit of the enterprise; on the other hand, it can also enhance the confidence of investors in the future development of the company, and stimulate the improvement of the stock price.MICHAEL PORTER put forward the concept of the value chain in his book Competitive Advantage, and he believes that every enterprise is in the process of designing, producing, selling, sending and supporting its products[12]. All these activities can be indicated by a value chain, and the value creation of a firm is constituted through a series of activities. Zhang Renzhi studied the conclusion that digital transformation of enterprises mainly promotes the efficiency of intellectual capital value creation by improving human capital, enhancing the innovation capability of enterprises and strengthening the relationship between enterprises and suppliers and customers[13]. Pan Liurong suggests that technological progress intervenes in novelty-type (efficiency-type) business model innovation and enhances corporate value creation through the technology introduction path[14].

3.3 Literature Review

In summary, according to the above research, it can be seen that scholars have conducted in-depth research from multiple perspectives and put forward many valuable views and conclusions, and this trend has triggered extensive attention from scholars in the boom of data elements development. At present, domestic and foreign academics have shown a spurt of discussions on data elements, and many scholars have proposed that the application of data elements has a positive effect on the creation of enterprise value, and at the same time, enterprise value creation as a more mature field of study, its theoretical and practical application has a long history, and the research results are also quite rich. However, it is worth noting that, although these two fields have been relatively mature in their respective studies, the in-depth exploration of combining the two is still insufficient, and the start time is relatively late, and the existing combined research stays at the theoretical level and lacks in-depth analysis of the actual application of the enterprise, especially at the level of empirical research and enterprise practice, which has a broad space for exploration. Therefore, this paper will take SANY heavy work as a case enterprise, and try to combine the data element related and enterprise mechanism creation for research.

4 CASE PRESENTATIONS

4.1 Introduction to SANY Heavy Industry

Since its establishment, SANY Heavy Industry Co., Ltd. has always been adhering to the corporate mission of "Quality Changes the World", adhering to independent innovation, and has rapidly risen to become a leader in the global equipment manufacturing industry. The development course of the company is full of challenges and opportunities, but SANY Heavy Industry has always maintained a steady development trend. With the corporate vision of "creating a first-class enterprise, creating first-class talents and making first-class contributions", SANY Heavy Industry is committed to becoming a leading equipment manufacturing enterprise in the world. The company focuses on the construction of corporate culture, advocates the core values of "being a human being first, doing things later", and encourages employees to be honest, dedicated, innovative and devoted. Meanwhile, SANY Heavy Industry also actively fulfills its social responsibility, pays attention to environmental protection and sustainable development, and strives to promote the green transformation of the industry. 2003, SANY Heavy Industry was successfully listed on the A-share market, becoming the first privately listed company in China's construction machinery industry. SANY Heavy Industry attaches great importance to technological innovation and invests more than 5% of its annual sales revenue in research and development. Up to now, the company has applied for more than 10,000 patents and authorized more than 7,000 patents, which is in the leading position in the industry. In terms of cost structure, SANY has achieved significant optimization through digital transformation.

4.2 Status of SANY Heavy Industry's Application of Data Elements

4.2.1 Process of applying data elements
Digital transformation strategy-Since 2018, SANY Heavy Industry has clearly put forward a digital transformation strategy, and with the deepening of digital transformation, it has begun to gradually increase the investment in and use of data elements. The core of this strategy lies in realizing the strategic transformation goals of "all business data" and

"all data business". Under the guidance of this strategy, SANY Heavy Industry has launched a comprehensive digital transformation process, and is committed to transforming all business activities into data, and optimizing business processes, improving operational efficiency, and innovating products and services through the analysis and application of data. Digital transformation for SANY Heavy Industry is not only a technical innovation, but also a profound business and management change. By introducing advanced technologies such as big data, cloud computing and artificial intelligence, SANY Heavy Industry has comprehensively reshaped and optimized its traditional business model and management processes. From product design, production and manufacturing to marketing and after-sales service, every link is integrated with digital elements, realizing the comprehensive coherence and intelligent application of data. Driven by digital transformation, SANY Heavy Industry has achieved high performance growth. Through the accurate analysis and application of data, the company is able to more accurately grasp market demand, optimize product design, improve production efficiency and reduce operating costs. At the same time, digital transformation has also improved SANY's market response speed and customer service capability, enabling the enterprise to better meet customers' individual needs and enhance market competitiveness.

Data analysis and application-SANY Heavy Industry makes full use of big data, artificial intelligence and other advanced technologies. Since 2008, SANY Heavy Industry has started to build a "terminal + cloud" industrial big data platform, which marks an important step for SANY Heavy Industry in the application of data elements. With the deepening of digital transformation, especially in the stage of comprehensive digital transformation (2018 to the present), SANY Heavy Industry has made full use of big data and artificial intelligence technology to an ever-deepening extent. The massive data collected is deeply mined and analyzed. Using advanced data analysis algorithmic models, it is able to extract valuable information and knowledge from the data, providing powerful data support for various business activities of the enterprise. In product development, SANY Heavy Industry uses data analysis technology to optimize product design and improve product performance and quality. By analyzing market feedback, customer usage data, etc., the enterprise can more accurately grasp the market demand and product performance requirements, so as to develop products that are more in line with market demand. In the manufacturing process, data analysis technology is used to optimize the production process and improve production efficiency and quality. Through real-time monitoring and analysis of various data in the production process, the enterprise can timely identify problems in production and make adjustments to ensure the stability and efficiency of the production process. After-sales service link, the use of data analysis technology to provide more efficient and intelligent after-sales service. Through the analysis of equipment operation data, enterprises can real-time monitoring of equipment operation status, timely detection of potential failures and early warning, to provide customers with more proactive, attentive service.

Intelligent service platform construction-Relying on the advanced industrial Internet platform, SANY Heavy Industry has successfully built a smart service platform covering the whole world. This platform integrates advanced technologies such as big data, cloud computing and artificial intelligence to realize real-time monitoring and intelligent management of SANY Heavy Industry' equipment worldwide. Through the intelligent service platform, SANY Heavy Industry is able to monitor the operation status of the equipment in real time, including the working hours, operation status and fault information of the equipment to ensure the normal operation of the equipment. Once the equipment is found to be abnormal or faulty, the platform can immediately carry out fault diagnosis and provide remote troubleshooting services to quickly solve the equipment problems and reduce the customer's downtime and maintenance costs. The intelligent service platform can also optimize the operation mode of the equipment. Through the analysis and mining of equipment operation data, the platform can discover the operation pattern and potential problems of the equipment, provide customers with more scientific operation suggestions and maintenance programs, and improve the operation efficiency and stability of the equipment.

The construction of the intelligent service platform not only improves the after-sales service level of SANY Heavy Industry, but also brings customers a more efficient and intelligent after-sales service experience. Customers can understand the operation status and maintenance situation of the equipment at any time through the platform, and obtain fault warning and maintenance suggestions in time to ensure the normal operation and productivity of the equipment.

4.2.2 Status of application of data elements

Intelligent Operation Ecosystem-SANY Heavy Industry has successfully built a comprehensive and intelligent operation ecosystem since 2018 through the in-depth application of data elements and relying on the advanced industrial internet operating system. In this ecosystem, SANY makes full use of the powerful functions of the industrial internet operating system to achieve comprehensive intelligence in all aspects of equipment, production and supply chain. Through real-time data collection and analysis, the enterprise can accurately grasp the production status, equipment status and market demand, so as to make more accurate decisions. This data-based decision-making not only improves production efficiency, but also reduces operating costs, bringing significant economic benefits to the enterprise. At the same time, the construction of the intelligent operation ecosystem also further enhances the market competitiveness of SANY Heavy Industry. Through digital transformation and the realization of intelligent manufacturing, the enterprise is able to respond more quickly to market changes and provide more personalized, high-quality products and services.

Lighthouse factory construction-Since the beginning of 2020, SANY Heavy Industry has built a number of lighthouse factories, becoming a leader in the global heavy industry. Among them, Beijing Piling Plant and Changsha Plant 18 stand out as the only two world lighthouse factories in the global heavy industry, which signifies that SANY Heavy Industry has reached the international leading level in intelligent manufacturing and application of data elements. The construction of these lighthouse factories is an important result of SANY Heavy Industry's in-depth application of data

elements and the construction of an intelligent operation ecosystem relying on the industrial Internet operating system. Through the in-depth integration of the manufacturing operation system, the Internet of Things management platform and other advanced systems, it realizes the intelligence and high efficiency of production and manufacturing, and greatly enhances the production efficiency and product quality of the enterprise. In the lighthouse factory, the manufacturing operation system is tightly integrated with the IoT management platform and other systems, realizing the comprehensive digitalization and intelligence of all aspects of equipment, production and supply chain. Through real-time data collection and analysis, companies can accurately grasp production conditions, equipment status and market demand, so as to make more accurate decisions. This data-based decision-making approach not only improves production efficiency, but also reduces operating costs, bringing significant economic benefits to the enterprise.

Data-driven product development-In the field of product development, SANY Heavy Industry has made full use of big data analysis technology to comprehensively optimize the product development process, significantly improving the efficiency and quality of product development. SANY Heavy Industry applies big data analysis technology to the whole process of product development, from demand analysis, design, testing to market, every link is integrated with the wisdom and power of data. At the early stage of product development, SANY Heavy Industry is able to accurately grasp the trends and changes in market demand for products by analyzing equipment operation data and market feedback data. This enables the company to fully consider the actual and potential needs of the market when designing products, avoiding blind development or excessive design. Big data analysis technology also plays an important role in the process of product development. Through real-time analysis and mining of design data, enterprises can identify problems in design and optimize them in time to ensure the progress and quality of product development. When the product enters the testing phase, big data analytics also plays an irreplaceable role. Through comprehensive analysis and mining of test data, enterprises can accurately assess the performance and stability of the product, and identify and solve potential problems in a timely manner. Ultimately, when the product is launched, big data analytics still provides strong support for the enterprise's marketing strategy. Through real-time analysis and mining of market feedback data, enterprises are able to keep abreast of product market performance and changes in customer demand, providing strong data support for continuous product improvement and upgrading.

Data-driven decision support-SANY Heavy Industry has built an advanced decision support system by fully utilizing the powerful capabilities of big data and artificial intelligence technology. This system provides real-time business data analysis and decision-making suggestions for the top management of the enterprise, enabling the enterprise to more accurately grasp the market dynamics and competitive situation, and providing powerful data support for the formulation of scientific and reasonable strategic planning and business strategies. The core of the decision support system lies in its powerful data analysis and forecasting capabilities. Through the real-time collection, storage and analysis of massive business data, the system is able to dig deeper into the laws and trends behind the data, revealing the nature and causes of market changes. This enables corporate executives to keep abreast of the latest market dynamics, including changes in customer demand, competitors' strategic adjustments, etc., so that they can make more rapid and accurate responses. In addition to data analysis and forecasting capabilities, the decision support system also provides rich visualization tools and interactive interfaces. This makes it easier for corporate executives to view and analyze data and discover key information and potential opportunities in the data. The ability to provide personalized decision-making suggestions and optimization solutions based on user preferences and needs further enhances the scientific and practical nature of decision-making.

5 DATA ELEMENTS DRIVE ENTERPRISE VALUE CREATION

This paper analyzes the effect of SANY Heavy Industry's data element-driven enterprise value creation using financial performance and non-financial performance. Among them, SANY Heavy Industry actively researches and develops and manufactures intelligent equipment in the process of realizing value creation, optimizes the industrial chain in the internal process of the enterprise, improves the production efficiency, and reduces the cost.

5.1 Financial Indicators

5.1.1 Total assets
The larger the size of an enterprise, the easier it tends to be able to access various resources, including capital, manpower, technology, etc. Therefore, this paper selects the company's total assets from 2013-2023 as the value of the company's size. These resources are the foundation for the development of the enterprise, which can support the enterprise to conduct more R&D, marketing and business expansion, so as to enhance the competitiveness and market position of the enterprise. At the same time, large-scale enterprises usually have a stronger ability to integrate resources, and can effectively allocate various resources to all aspects of the enterprise, improve the efficiency of resource use, reduce costs and increase profits, which can reflect the company's enterprise value from the side. As shown in Figure 1, since 2018, SANY Heavy Industry has vigorously developed the application of data elements, the company's scale has developed rapidly, even during the new crown epidemic, the company's scale is still showing an overall upward trend, and in 2022 it is more than double that of 2017, which can be intuitively seen that the application of data elements has a high impact on the development of enterprises.
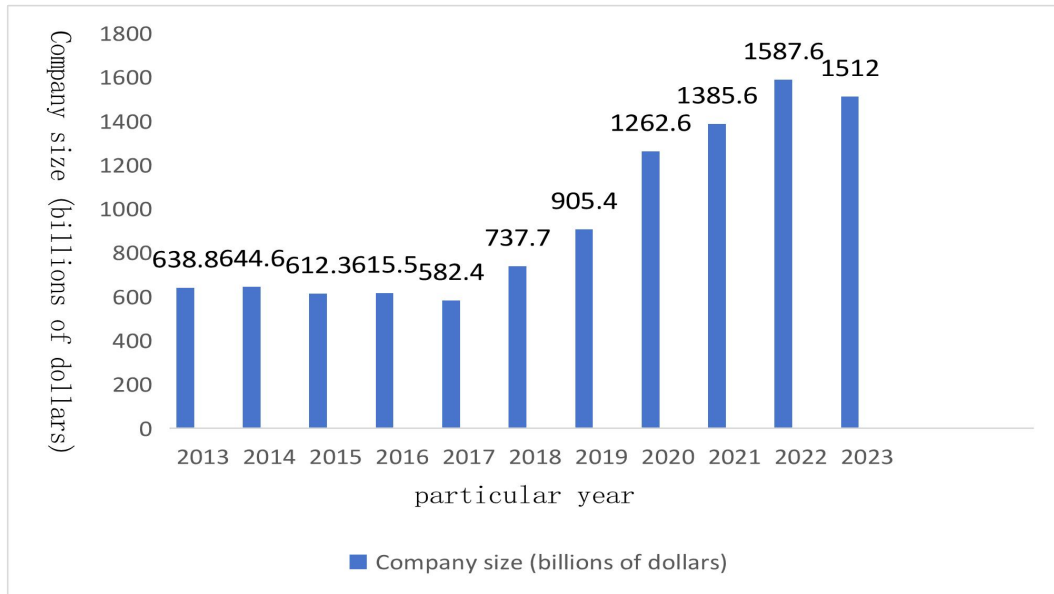
Figure 1 Total Assets of SANY Heavy Industry, 2013-2023

Data source: SANY Heavy Industry annual report collated

5.1.2 Total market capitalization

The total market capitalization indicator is selected by taking the value of the company's total market capitalization for the calendar years 2013-2023, because the change in the company's total market capitalization is usually closely related to the company's performance and growth. When a company performs well and has good growth, investors are confident in the future development of the company and are willing to buy the company's shares at a higher price, thus driving up the total market capitalization of the company. Conversely, when a company performs poorly or has limited growth, investors' confidence in the company declines, which may lead to a decline in the company's total market capitalization. As can be seen in Figure 2, since Trinity Heavy Industry vigorously developed the application of data elements in 2018, the market capitalization doubled in the following year, and then doubled again in 2020, reflecting strong investor support for the policy, and although the market capitalization slowly declined after 2020, it is still a great progress compared to before 2018, which side by side reflects the impact of data elements on the company's enterprise value.
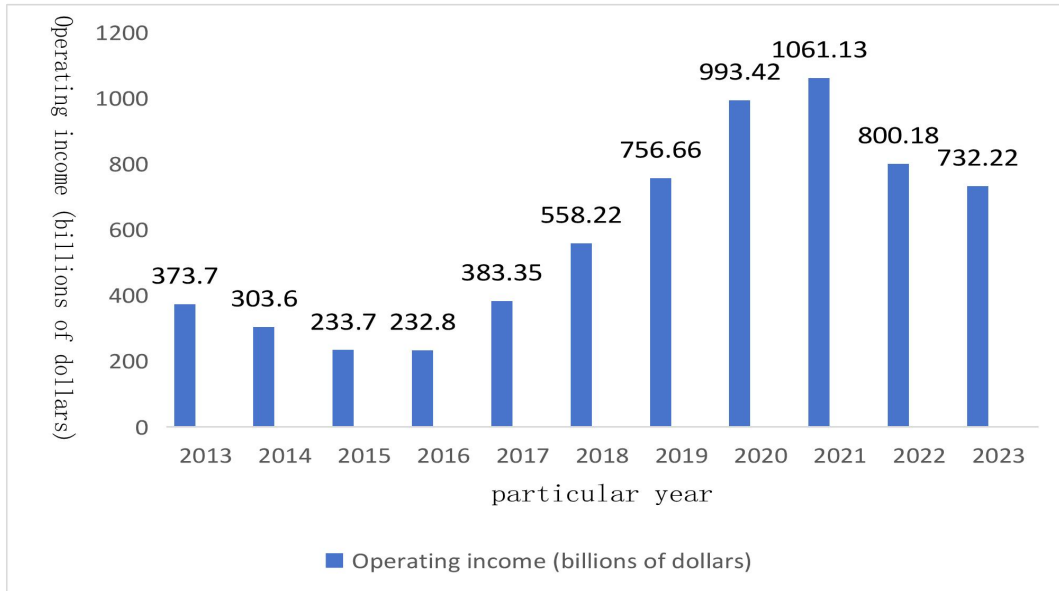

Figure 2 Total Market Capitalization of SANY Heavy Industry, 2013-2023

5.1.3 Operating income

The operating income indicator is selected by taking the value of the company's operating income for the calendar years of 2013-2023, because the growth speed and quality of operating income also reflect the operating efficiency and

market competitiveness of the enterprise. Under the same conditions, enterprises with faster growth in operating income tend to have higher operating efficiency and stronger market competitiveness, and can better meet market demand and resist market risks, thus enhancing enterprise value. As can be seen from Figure 3, the company's operating income is generally showing an upward trend, with rapid development and fast growth since 2018, and there is a decline in operating income in 2021 due to the impact of the epidemic, but the overall trend is showing an increase, which also side by side reflects that the application of the data elements in 2018 has a significant impact on the enterprise value of Trinity Heavy Industry.

Figure 3 Annual Operating Income of SANY Heavy Industry, 2013-2023

5.1.4 Enterprise value

In terms of enterprise value, the enterprise value calculated in Figure 4 is measured using the (total market capitalization/total assets) measure, as can be seen in the table, it reached 2.3 in 2020, indicating that at this time, SANY Heavy market performance is high, also from 2018 onwards, significant growth, in 2018, SANY Heavy began to focus on the development of the importance of the data elements, even if the challenges of the epidemic are faced in 2021, SANY Heavy also can realize the gradual expansion of the company's size, the overall trend of the total market capitalization is upward, and the company's growth is generally upward task shows that investors recognize the value of the enterprise.
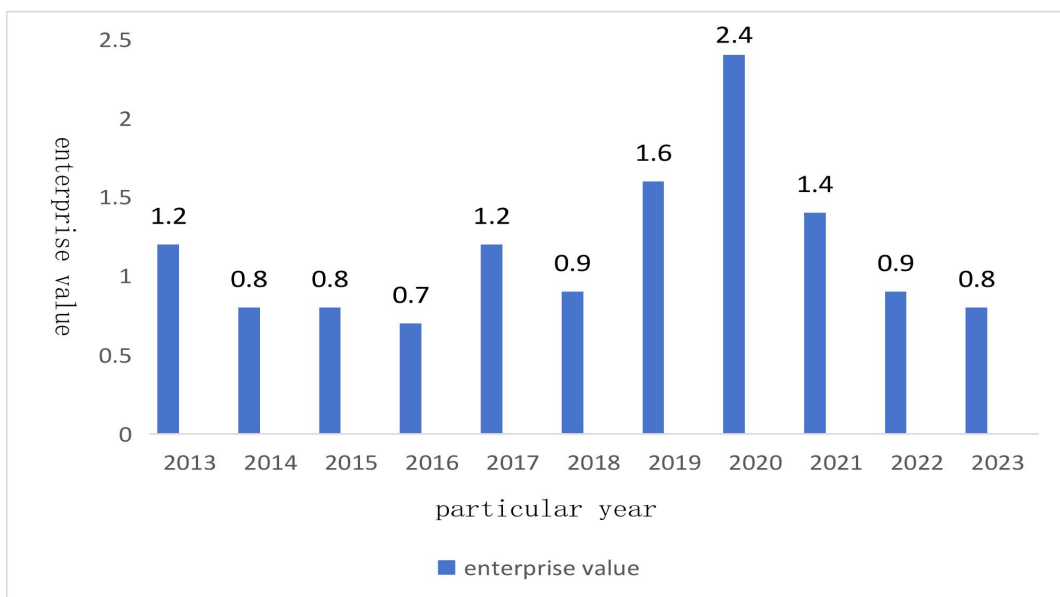
Figure 4 SANY Enterprise Value, 2013-2023

5.1.5 Selling and administrative expense ratios

As can be seen from Figure 5, after optimizing the internal value chain, SANY Heavy Industry enhances the flexibility and adaptability in storage, transportation and sales, and improves the efficiency of the flow. The application of data

elements improves the level of enterprise operation and management, and the position in the value chain has been improved, with the right to speak. From the point of view of sales expense ratio and management expense ratio, the overall ratio is getting lower and lower, and the cost of spending on product sales has been reduced; the management expense ratio has a large change, and the whole is in a downward trend, which indicates that its management costs have been controlled, reflecting that SANY Heavy Industry has improved the utilization rate of expenses through the use of digital technology, automated equipment, etc., which in turn has improved the value creation of the enterprise.
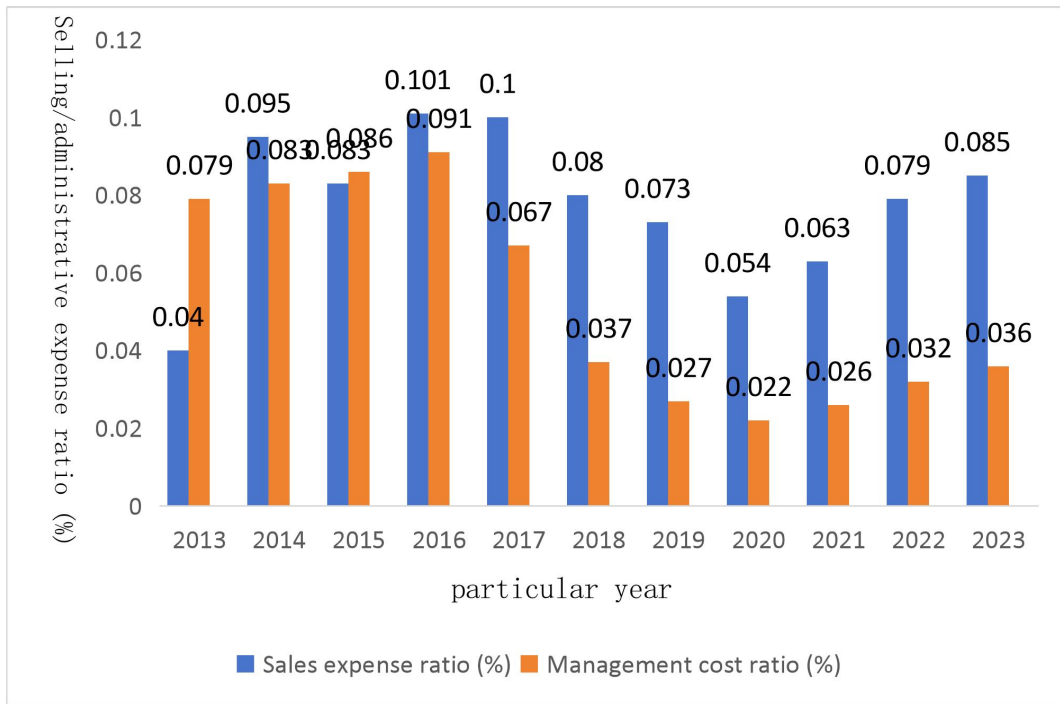

Figure 5 Selling Expense Ratio and Administrative Expense Ratio of SANY Heavy Industry 2013-2023

5.2 Non-financial Indicators

5.2.1 Breadth of data element coverage

We can make an in-depth analysis from multiple dimensions such as the breadth of data element coverage, innovation ability, brand value and market position. The following is a specific analysis, the breadth of data element coverage refers to the frequency of keywords related to data elements in the annual report of each year, Figure 6 can be seen that SANY Heavy Industry is focusing on the development of this direction precisely on the occasion of 2018, and SANY Heavy Industry has realized the operation status of the equipment on a global scale through the industrial Internet platform of real-time monitoring and data analysis. This not only covers all kinds of data in the production process, but also includes multi-dimensional information such as market feedback, equipment operation, etc., showing the breadth of data elements covered.
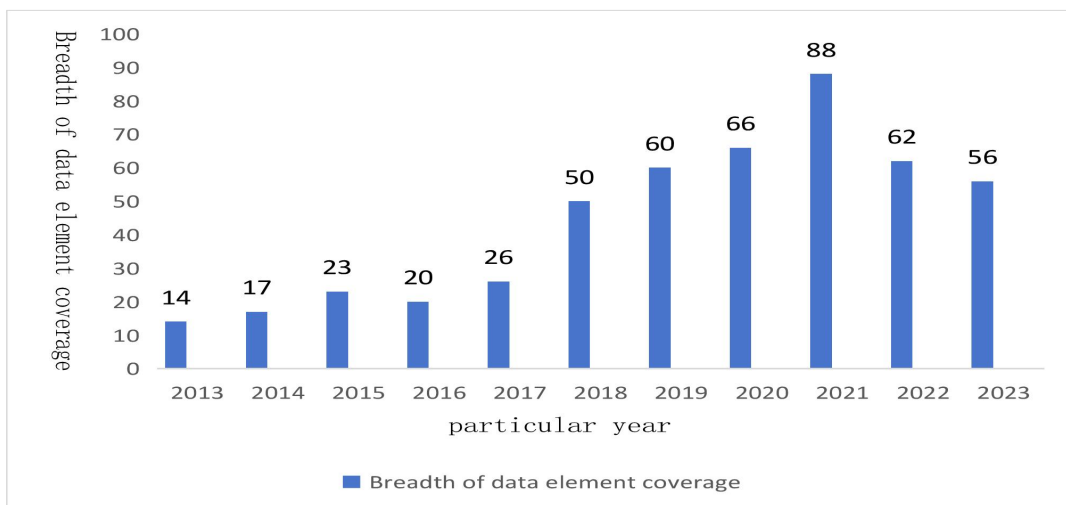

Figure 6 Breadth of SANY Heavy Industry's Data Element Coverage Rate from 2013-2023

5.2.2 Creative ability

SANY Heavy Industry has made remarkable achievements in the field of intelligent manufacturing, significantly improving the level of manufacturing processes and production efficiency by introducing robots, automation systems, IoT, visual recognition, AI and other technologies. The company also actively promotes digital transformation and has established several digital platforms, such as MES (Manufacturing Execution System) and MOM (Manufacturing Operation Management Platform), realizing the digitization of the whole process from product design, manufacturing to sales and service. Meanwhile, SANY spares no effort in innovation, constantly launching new products and technologies. For example, the company's self-developed L4-class driverless dump trucks, intelligent all-ground cranes, and disaster relief robots are all innovative products in the industry, demonstrating the company's strong strength in technology research and development.

5.2.3 Market position or market power

SANY Heavy Industry's share of the construction machinery market has continued to expand, and the company's market position and influence have increased significantly through digital transformation and the promotion of intelligent manufacturing. In several segments, such as excavators and concrete machinery, SANY occupies a leading position. Meanwhile, SANY Heavy Industry' business and industrial bases are spread all over the world, with overseas R&D and manufacturing bases in many domestic cities as well as in India, the United States, Germany and Brazil. This globalization layout not only enhances the company's market competitiveness, but also improves its international influence.

5.2.4 Brand value or brand influence

As SANY Heavy Industry continues to make breakthroughs in intelligent manufacturing and digital transformation, the company's brand influence is also increasing. The company has repeatedly won recognition and awards from domestic and international authorities, such as the "Lighthouse Factory" certified by the World Economic Forum, etc. These honors have further enhanced SANY Heavy Industry's brand image and market position. As shown in Figure 7, SANY Heavy Industry did not appear on the Forbes Global 2000 list during the period of 2013-2019, but has been vigorously developing the application of data elements since 2018, and the maturity of the technology will enable the company to enter the Global 2000 in 2020, and even the Global 500 in 2021.
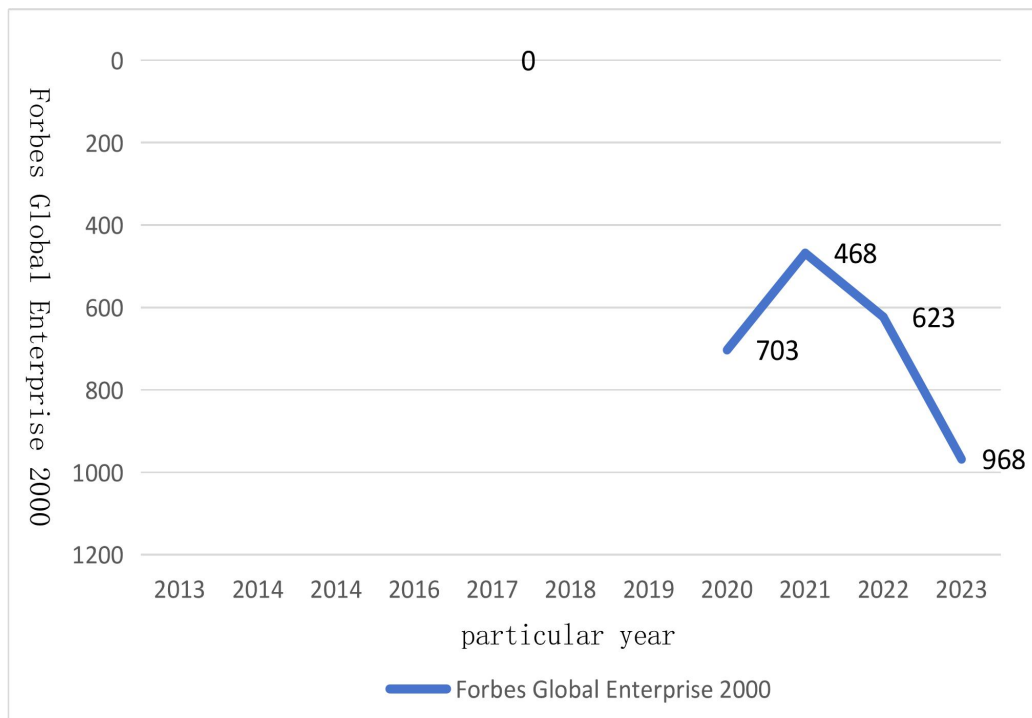

Figure 7 SANY Heavy Industry World Ranking 2013-2023

6 CONCLUSIONS AND IMPLICATIONS

Through in-depth analysis of SANY Heavy Industry, we find that data elements play a crucial role in the process of enterprise value creation. SANY Heavy Industry has successfully constructed a data-driven decision support system and intelligent manufacturing system through the deep excavation and application of big data, artificial intelligence and other advanced technologies, realizing the intelligent upgrading of production operations, product development, marketing and other aspects. In this process, data has not only become a key tool for enterprises to gain insight into market demand, optimize resource allocation, and improve product quality and efficiency, but also promotes the innovation of business models and the reconstruction of the value chain. SANY Heavy Industry's practice shows that the effective utilization of data elements can significantly enhance the core competitiveness of enterprises and drive the continuous growth of enterprise value. Enterprises should fully recognize the importance of data as a new production

factor, strengthen the accumulation, integration and management of data resources, and ensure the authenticity, integrity and timeliness of data. Through the establishment of a perfect data governance system, the quality and usability of data can be improved to provide strong support for enterprise decision-making. SANY Heavy Industry's successful experience tells us that enterprises should actively introduce advanced information technology, promote the optimization and reengineering of business processes, and realize the intelligent upgrading of production operations, product development, marketing and other aspects. By building a data-driven decision support system and intelligent manufacturing system, the operational efficiency and innovation ability of the enterprise is enhanced. The value of data elements lies in their analyzing and application capabilities. Enterprises should establish a perfect data analysis team and mechanism, use advanced data analysis technology and tools, dig deep into the laws and trends behind the data, and provide a scientific basis for the strategic planning and operational decision-making.

COMPETING INTERESTS

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REFERENCES

[1] Gao Fuping, Ran Gaora. Data Factor Market Formation Theory--A Mechanism Framework for Data Factor Governance. Shanghai Economic Research, 2022, (09): 70-86.

[2] Xu Bin, Xu Shoubo. Hierarchy theory of factors of production. Journal of Beijing Jiaotong University (Social Science Edition), 2006, 5(4): 15-18.

[3] Farboodi M, Veldkamp L, A Growth Model of the Data Economy. SocialScience Electronic Publishing, 2020, 28(8): 13-58.

[4] Carriere-Swallow Y, Haksar V. The Economics and Implications of Data; AnIntegrated Perspective. IMF Departmental Papers / Policy Papers, 2019, 19(13): 1-51

[5] Jones C I, Tonetti C. Nonrivalry and the Economics of Data. American Economic Review, 2020, 110(9): 2819-2858.

[6] Posner E, Weyl E. Radical Markets: Uprooting Capitalism and Democracy for a Just Society. Princeton: Princeton University Press, 2021: 205-249.

[7] Xie Kang, Xia Zhenghao, Xiao Jinghua. Enterprise realization mechanism of big data becoming a real production factor: A product innovation perspective. China Industrial Economy, 2020, 386(5): 42-60.

[8] Kong Yanfang, Liu Jianxu, Zhao Zhongxiu. Research on market allocation of data factors: connotation deconstruction, operation mechanism and practice path. The Economist, 2021, 275(11): 24-32.

[9] Li Zhiguo, Wang Jie. Digital economy development, data factor allocation and manufacturing productivity improvement. The Economist, 2021, 274(10): 41-50.

[10] Qi Yudong, Liu Huanhuan. Research on production factor attributes of data and its market-oriented allocation mechanism under digital economy. Economy, 2020, 420(11): 63-76+2.

[11] Yang Qingxiang, Liao Sweet. Research on the relationship between internal control, technological innovation and value creation ability. Journal of Management, 2017, 14(08): 1190-1198.

[12] Michael Porter. Competitive Advantage: Creating and Sustaining Superior Performance. New York: Free Press, The Academy of Management Review. 1985.

[13] Zhang Renzhi. Can enterprise digital transformation improve the efficiency of intellectual capital value creation? Research on Financial Issues, 2023, (5): 89-100.

[14] Pan Liurong. Technological Progress Path, Business Model Innovation and Corporate Value Creation--Taking Listed Companies in Distribution Industry as an Example. Research on Business Economy, 2023, (4): 150-153.

RESEARCH ON METHODS TO IMPROVE AUDIT EFFICIENCY OF RURAL REVITALIZATION PROJECTS USING BIG DATA TECHNOLOGY

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Abstract: With the deepening implementation of the rural revitalization strategy, audit work plays a crucial role in ensuring the reasonable use of project funds and the proper execution of policies. This paper aims to explore methods to enhance the audit efficiency of rural revitalization projects under the big data information technology environment. By analyzing the current state of auditing rural revitalization projects, it reveals issues such as poor fund management, ineffective project execution, and insufficient auditing capabilities. It also proposes countermeasures such as optimizing policy design, strengthening whole-process supervision, enhancing interdepartmental collaboration, applying big data information technology, and cultivating multidisciplinary auditing talents. The research results indicate that using information technology and scientific management methods can effectively improve audit efficiency, enhance project transparency, and promote the precise implementation of rural revitalization policies. The conclusion suggests that building an intelligent and efficient audit system will help ensure the sustainable development of rural revitalization projects and the achievement of strategic goals.
Keywords: Rural Revitalization Projects; Audit efficiency; Big data information technology; Fund management; Policy implementation; Whole-Process supervision

1 INTRODUCTION

With the comprehensive implementation of China's rural revitalization strategy, the development and revitalization of rural areas have been placed at the core of the national development agenda. Rural revitalization is not only an important measure to address rural poverty but also a crucial step in promoting balanced urban and rural development and achieving national modernization. As a key component of the rural revitalization strategy, rural revitalization projects involve substantial financial investments, resource allocation, and project management. Therefore, ensuring the efficient operation of these projects, the reasonable and compliant use of funds, is a necessary safeguard for achieving the goals of rural revitalization. In this context, the importance of audit work becomes increasingly prominent. Through audits, it is possible to monitor the flow of funds, ensure transparency in project execution, and enhance the effectiveness of policy implementation.

However, auditing rural revitalization projects faces complex practical challenges. Due to the extensive and intricate nature of these projects, the auditing process is often plagued by issues such as irregular fund management, low project execution efficiency, and inadequate policy implementation [1]. These problems not only affect the efficiency of audit work but also adversely impact the effectiveness of the rural revitalization strategy's implementation. For example, some regions experience fund stagnation, slow project progress, and imperfect supervision mechanisms, leading to resource waste and reduced project benefits [2].

To address these issues, it is particularly urgent to improve the audit efficiency of rural revitalization projects. With the rapid development of information technology, especially the widespread application of big data technology, auditing work has acquired new technical means to enhance efficiency and quality. Big data technology can help auditors comprehensively grasp key information such as fund flows and project execution status, enabling the monitoring and analysis of the entire project lifecycle [3]. Therefore, this study will focus on the application of big data technology in audit work, exploring how technological means can optimize audit processes and improve audit quality and efficiency.

The purpose of this study is not only to identify the key issues in the current auditing of rural revitalization projects but also to propose innovative auditing methods to address these challenges. By utilizing big data information technology, the accuracy and timeliness of audits can be enhanced, ensuring reasonable fund allocation and effective policy implementation, thereby providing solid support for the successful implementation of rural revitalization projects.

2 CURRENT STATE OF AUDITING RURAL REVITALIZATION PROJECTS

In the implementation of rural revitalization projects, the current state of fund management and project execution directly affects the efficiency and quality of audit work. Although national and local governments place high importance on rural revitalization projects, many management issues have still been identified during audits, leading to project progress falling short of expectations. These problems are not only evident in fund management but also exist in project execution and the implementation of supervision mechanisms.

2.1 Analysis of the Current State of Fund Management

The funding sources for rural revitalization projects mainly include national special funds, local government matching funds, and social capital. The scale of funding is substantial, and the scope of projects is extensive. However, in actual operations, numerous problems in fund management have been exposed. Firstly, some projects have issues with arbitrarily expanding the scope of fund usage beyond the predetermined purposes, thereby questioning the effectiveness of fund utilization [4]. Secondly, the lack of adequate matching funds from local governments affects the overall progress of projects [5]. Lastly, the scheduling and disbursement of funds for some projects are not timely, leading to project implementation delays and even instances of fund idleness [6]. These issues severely impact the efficiency of rural revitalization fund usage.

2.2 Analysis of the Current State of Project Execution and Supervision Mechanisms

In terms of project execution, governments at all levels and relevant departments have set clear goals, tasks, and responsibilities to promote rural revitalization projects. However, due to deep-seated rural poverty and weak infrastructure, project execution is particularly challenging in some regions [7]. Although local governments have formulated detailed implementation plans, some projects still experience slow progress and poor outcomes during execution [8]. Moreover, although China has established relatively comprehensive supervision mechanisms for rural revitalization projects, including internal supervision, financial audits, and social supervision across multiple levels, the effectiveness of these mechanisms is limited in some regions. The supervision methods are singular and lack sufficient collaboration, making it difficult to promptly identify and resolve issues in project execution [9].

2.3 Analysis of the Current State of Policy Implementation and Effectiveness Evaluation

The core of rural revitalization policy lies in precise execution to ensure the implementation and effectiveness of policies. However, in the actual process of policy implementation, some regions still exhibit inadequate policy execution and unclear responsibilities [10]. Additionally, the work of policy effectiveness evaluation is neither timely nor comprehensive, failing to systematically reflect the actual progress and benefits of projects. For example, some regions do not provide timely feedback or make adjustments during policy evaluations, resulting in the positive effects of policies not being fully realized and the overall effectiveness of policy implementation being weakened.

2.4 Main Problems in the Audit Process

During the audit process, issues such as chaotic asset management and imperfect supervision mechanisms in rural revitalization projects have also been identified. Many rural revitalization projects have unclear asset bases and lack management systems, affecting project operational efficiency [11]. Furthermore, the level of audit informatization is low, with dispersed grassroots data and inconsistent data quality, making it difficult for auditors to accurately grasp fund flows and project progress during audits, thereby limiting the improvement of audit efficiency [12].

Overall, numerous problems in fund management and policy execution of rural revitalization projects have been exposed during audits. To improve audit efficiency, it is necessary to further refine fund management mechanisms, strengthen project execution supervision, and enhance the level of informatization management, ensuring that funds and projects can truly serve the long-term goals of the rural revitalization strategy.

3 PROBLEMS IN AUDITING RURAL REVITALIZATION PROJECTS

In actual audit work, the complexity and breadth of rural revitalization projects have introduced numerous institutional and execution-related issues. These problems not only constrain the efficiency of audit work but also affect the effective use of rural revitalization funds and the precise implementation of policies. Through the analysis of the current state of auditing, the following main issues can be summarized.

3.1 Issues in Fund Management and Usage

Fund management problems are among the most prominent issues in the current auditing of rural revitalization projects. Audits in some regions have revealed significant instances of fund idleness, delayed disbursement, or misappropriation. For example, audits have found that some funds were not used according to the predetermined purposes, posing risks of fund misappropriation, embezzlement, and even corruption. The lack of adequate fund coordination and integration has also led to unreasonable fund distribution, causing some projects to progress slowly or even come to a standstill due to insufficient funds. Additionally, there are loopholes in the fund supervision mechanisms, preventing the timely detection and correction of irregularities in fund usage, thereby exacerbating fund management issues.

3.2 Issues in Project Construction Management and Policy Implementation

Ineffective project construction management and policy implementation are also commonly observed problems in the auditing of rural revitalization projects. In some regions, there is a lack of scientific justification during the project planning and implementation phases, leading to inadequate management during project progression, resulting in slow progress or substandard construction quality. During audits, it was also found that some projects lack technical support

during execution, and maintenance after project completion is inadequate, affecting the long-term benefits of the projects. Furthermore, some local governments have insufficient understanding of rural revitalization policies, leading to imprecise policy implementation and even forms of formalism, resulting in an increasing gap between project execution and policy objectives.

3.3 Issues in Auditing Capacity and Efficiency

Regarding auditing capacity and efficiency, some auditors do not have a comprehensive understanding of rural revitalization policies, and their professional technical methods are outdated, affecting the depth and breadth of audit work. The information systems relied upon for audit work are insufficiently developed, with dispersed and low-quality data, limiting auditors' ability to fully grasp fund flows and project progress. Moreover, audit rectifications are not timely, and recurrent issues persist, significantly diminishing the actual effectiveness of audit work. Auditors lack innovation in technical methods, employing relatively traditional audit approaches, and have not fully leveraged big data information technology's potential in audit work.

3.4 Issues in Supervision Mechanisms and Audit Rectifications

Incomplete supervision mechanisms have resulted in audit findings not being effectively rectified. There is a lack of coordinated cooperation between internal and external supervision, with supervision methods being singular and insufficient in intensity, preventing in-depth audit work. In some regions, audit rectification mechanisms are merely formalities, with rectifications being untimely and inadequate, leading to the recurrence of certain issues. Auditors face high work pressure and limited resources, making long-term tracking and rectification difficult, further increasing the challenges of audit work.

In summary, the current auditing of rural revitalization projects faces multiple dilemmas, including irregular fund management, weak project construction management, limited auditing capacity, and incomplete supervision mechanisms. These issues not only hinder the improvement of audit efficiency but also impact the comprehensive advancement of the rural revitalization strategy. Therefore, it is necessary to overcome these challenges by strengthening policy design, optimizing management processes, and enhancing the quality of auditing personnel.

4 COUNTERMEASURES AND RECOMMENDATIONS TO IMPROVE THE AUDIT EFFICIENCY OF RURAL REVITALIZATION PROJECTS

Facing the numerous problems in auditing rural revitalization projects, it is necessary to adopt comprehensive measures from multiple dimensions, including policy design, management mechanisms, technological applications, and talent cultivation, to enhance audit efficiency and quality. The following are several specific countermeasures and recommendations to help audit work better serve the implementation of the rural revitalization strategy.

4.1 Optimize Policy Design and Establish Cross-Departmental Collaboration Mechanisms

Optimizing the policy design of rural revitalization projects is the primary task to improve audit efficiency. To ensure that funds and projects closely align with the national rural revitalization strategy, the systematization and synergization of policies should be strengthened. In the early stages of project implementation, cross-departmental working groups should be established to coordinate and manage various project processes, ensuring that projects proceed smoothly within the policy framework. Cross-departmental collaboration can effectively reduce information asymmetry issues and enhance the efficiency of fund and resource allocation. At the same time, cross-departmental collaboration incentive mechanisms should be developed to evaluate the collaborative outcomes of each department and implement rewards and penalties, thereby motivating relevant departments to actively participate in project collaboration.

4.2 Enhance Local Governance Capacity and Implement Whole-Process Supervision Mechanisms

During project execution, the quality and efficiency of audit work depend on the governance capacity of local governments. To ensure whole-process supervision of projects, it is recommended to implement a whole-process tracking audit mechanism. Just as the 'curriculum ideological education' concept in teaching reform emphasizes systematization, audit work should also adopt a systematic management approach to ensure that audit work covers the entire project lifecycle, thereby enhancing the effectiveness of policy execution [13]. Through close cooperation between audit agencies and local governments, every stage from project planning to fund disbursement, project implementation, and subsequent management should be supervised to ensure the depth and continuity of audits. Local governments can also introduce third-party accounting firms to supervise projects and use remote monitoring methods to enhance supervision effectiveness. Additionally, electronic archive management systems should be promoted, with all project archives digitized to ensure that auditors can access the latest project information at any time, reducing information lag in audit work.

4.3 Strengthen Interdepartmental Collaboration and Build Information Sharing Mechanisms

In auditing rural revitalization projects, enhancing interdepartmental information sharing can significantly improve audit efficiency. Utilizing big data information technology, especially blockchain technology, can establish a shared audit platform, enabling information interoperability and connectivity between audit agencies and relevant departments. Through a shared audit platform, auditors can quickly access project-related data, reduce the workload of manual verification, and improve the accuracy and efficiency of audit decision-making. Just as nursing interventions can significantly improve the rehabilitation outcomes of patients with scoliosis, early intervention and risk warning mechanisms in audit work can similarly reduce fund management and execution deviations in rural revitalization projects, ensuring smooth project progression [14]. Information sharing can also eliminate information barriers between departments, promote data circulation and integration across different systems, thereby enhancing overall audit quality.

4.4 Utilize Big Data Information Technology to Enhance Audit Accuracy and Efficiency

Big data information technology has brought unprecedented opportunities to audit work. Just as MOOC technology is effectively applied in medical education, by introducing big data and information technology, auditors can flexibly address various fund flow issues in rural revitalization projects, improving audit accuracy and efficiency [15]. During the audit process, the use of big data analysis tools can comprehensively collect information on project fund flows and project progress, conducting multi-dimensional data mining and analysis to enhance the coverage and accuracy of audits. Similar to the precise analysis of complex data in medical research, auditing rural revitalization projects also requires precise monitoring of complex fund flows through big data technology to ensure the reasonable allocation and use of funds [16]. By constructing a big data analysis system for rural revitalization projects, auditors can quickly identify anomalies in project fund usage and make timely adjustments and rectifications. Additionally, big data technology can facilitate comparative analysis of historical audit data, effectively improving the timeliness of audit work.

4.5 Cultivate Multidisciplinary Auditing Talents

Enhancing the quality and capabilities of auditing personnel is an important guarantee for improving audit efficiency. Rural revitalization projects involve multiple fields; auditors not only need financial knowledge but also must understand specialized knowledge in agriculture, engineering, environmental protection, and other areas. Therefore, it is essential to intensify the cultivation of multidisciplinary auditing talents. It is recommended to enhance auditors' capabilities in big data auditing and information management through regular training, professional certification, and practical exercises. Additionally, audit departments should encourage auditors to learn and accumulate cross-disciplinary knowledge to improve their professionalism and decision-making abilities when dealing with complex project audits.

By implementing these countermeasures and recommendations, audit work can gradually achieve precision, intelligence, and efficiency. Supported by information technology, auditors can better grasp the overall picture of projects, enhance the comprehensiveness and effectiveness of audit supervision, and thereby safeguard the smooth implementation of the rural revitalization strategy.

5 CONCLUSION

Through the analysis of the current state of auditing rural revitalization projects, it is evident that although audit work plays an important role in ensuring the reasonable use of rural revitalization funds and the efficient advancement of projects, it still faces multiple challenges such as poor fund management, inadequate project execution, insufficient auditing capacity, and incomplete supervision mechanisms. These issues not only constrain the efficiency of audit work but also affect the precise implementation of rural revitalization policies and the maximization of project benefits. Therefore, improving audit efficiency and quality is of significant importance for the smooth implementation of the rural revitalization strategy.

To effectively address the problems in audit work, this study has proposed several countermeasures and recommendations to enhance audit efficiency. Firstly, optimizing policy design and establishing cross-departmental collaboration mechanisms to ensure close alignment between policies and projects, thereby improving the systematization and scientific management of projects. Secondly, enhancing local governance capacity through whole-process supervision and tracking audits to ensure that audit work covers every critical aspect of the project. Thirdly, utilizing big data information technology to build shared audit platforms, achieving information sharing and resource integration, thereby enhancing audit transparency and decision-making efficiency. Additionally, promoting the cultivation of multidisciplinary auditing talents to strengthen the professional quality of the audit team, enabling them to cope with increasingly complex audit tasks.

The application of big data and information technology, especially the introduction of blockchain and data analysis tools, will significantly enhance the precision and efficiency of audit work. By constructing an audit big data platform, auditors can more comprehensively grasp fund flows, project progress, and policy implementation statuses, achieving supervision and real-time feedback for the entire project lifecycle. At the same time, big data technology can help audit departments identify potential risks and issues from vast amounts of data, enabling timely response measures to minimize audit blind spots.

In the future, as the rural revitalization strategy continues to deepen, audit work will face more new challenges. Therefore, audit agencies and relevant departments should continue to improve audit mechanisms, continuously innovate audit methods, keep pace with technological developments, and continuously enhance the intelligence and technological levels of audit work. This will not only help improve the efficiency of audit work but also provide a solid guarantee for the comprehensive success of the rural revitalization strategy.

In summary, constructing a scientific and efficient audit system for rural revitalization projects will provide strong support for ensuring the transparency of fund usage, the effectiveness of policy implementation, and the maximization of project benefits. Through the continuous optimization of audit work and the application of technological means, the implementation effects of the rural revitalization strategy will become more significant, and rural development will thus reach a new level.

COMPETING INTERESTS

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REFERENCES

[1] Rong X, He XR, Yuan XF, et al. Research on the Path of Effective Integration of Poverty Alleviation and Rural Revitalization in Yunnan Province from an Audit Perspective. Sustainable Development, 2022, 12(6): 1532-1537.

[2] Wang CL, Yang HT, Zhang FJ, et al. Analysis of the Problems and Causes of Fund Management in Rural Revitalization in Zhejiang Province. Sustainable Development, 2022, 12(3): 697-702.

[3] Liu JN. Strategies for Improving the Audit of Government Investment Projects in the New Normal. Modern Engineering Project Management, 2022, 1(2): 194-196.

[4] Su SM. Exploration of the Construction of Grassroots Agricultural Technology Promotion Systems under the Background of Rural Revitalization. Agricultural Science and Development, 2024, 3(4): 70-72.

[5] Bao SG, Feng XY. Current Situation, Problems, and Improvements of Agricultural Infrastructure Investment. Rural Finance Research, 2021, 8: 3-10.

[6] Li GZ, Luo H, Hu HY, et al. Research on the Training Models and Main Problems of Professional Farmers under the Background of Rural Revitalization. Journal of Yunnan Agricultural University (Social Sciences), 2023, 17(1): 35-41.

[7] Song BS, Wu QL, Wang PF. Practical Demands and Countermeasures for Collaborative Governance of Rural Ecological Environment. Zhongzhou Journal, 2021, 43(06): 39-45.

[8] Lin C, Guo YJ, Jiao FV. Analysis of the Dilemmas and Countermeasures of the New Round of Homestead System Reform Pilot Based on Pilot Implementation and Institutional Reform Perspective. Taiwan Agricultural Exploration, 2022, 44(3): 21-26.

[9] Wang WL. Altruistic Rent-Seeking and Its Correction in the Implementation of Rural Revitalization Projects: A Case Study of S Town in Central Region. Journal of Jiangxi University of Finance and Economics, 2023, (6): 84.

[10] Wang F, Sun YX. Rural Revitalization Audit: Key Issues and Optimization Paths. Accounting Friend, 2023, (24): 13-19.

[11] Tian YP, Liao WK. Practical Exploration of the "Three Rights Separation" Reform of Homestead in Ethnic Tourism Areas: An Example from Dali City, Yunnan Province. Journal of Yunnan Agricultural University (Social Sciences), 2021, 15(4): 104-110.

[12] Xia SY, Wang G, Ma SJ. The Internal Mechanism, "Block Points," and Path Choices of Financial Technology Assisting Rural Revitalization. Oriental Forum—Journal of Qingdao University (Social Sciences Edition), 2022, (5): 92-103.

[13] Pang XR, Liu F, Li L, et al. Preliminary Exploration of Teaching Reform of "General Medicine Introduction" Based on the "Curriculum Ideological Education" Concept. Journal of Youjiang Ethnic Medical College, 2020, (06): 806-809.

[14] Cui XL, Yang ML. The Impact of Nursing Interventions Based on the Rosenthal Effect on Stress Responses and Emotional States of Scoliosis Patients. Journal of Youjiang Ethnic Medical College, 2019, (06): 713-715.

[15] Wu PX, Lan ZY, Huang W, et al. Exploration of the Application of MOOC-Based Blended Teaching Model in Medical Undergraduate Interns. Journal of Youjiang Ethnic Medical College, 2020, (01): 119-122.

[16] Yang MX, Niu SR. Culturing and G-banding Karyotype Analysis of Peripheral Blood Lymphocytes from Couples with Adverse Pregnancy History Using 5309. Journal of Youjiang Ethnic Medical College, 2019, (05): 520-522.

THE INTERSECTION OF PUBLIC ADMINISTRATION AND NONPROFIT ORGANIZATION RESEARCH: PERSPECTIVES ON GOVERNANCE NETWORKS AND SOCIAL EQUITY

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Abstract: This study aims to explore the intersection between public administration and nonprofit organization research, particularly from the perspective of governance networks and social equity. By analyzing their synergy and interaction in terms of theory, research themes, and methodology, the study employs systems theory, network theory, organizational theory, management theory, sociology theory, and economics theory. It utilizes qualitative, quantitative, and mixed research methods through literature reviews and theoretical analyses to reveal the significance of social equity, governance networks, organizational change, and public participation in the study of public administration and nonprofit organizations. The results indicate that the collaborative relationship between public administration and nonprofit organizations in social services, policy-making, and resource allocation is crucial for advancing social equity and justice. The conclusion asserts that interdisciplinary research and collaboration not only enhance governance efficiency but also provide important theoretical and practical guidance for future public services and social development.

Keywords: Public administration; Nonprofit organizations; Governance networks; Social equity; Interdisciplinary research; Organizational change; Public participation

1 INTRODUCTION

As social problems become increasingly complex and diverse, the theories and methods of a single discipline often prove inadequate in addressing public issues. To better address complex problems such as social equity, public participation, and resource management, the study of public administration and nonprofit organizations has increasingly moved toward integration. This integration not only provides researchers with a rich theoretical framework but also brings practical advantages through multi-stakeholder collaboration. Public administration focuses on government management and policy implementation, while nonprofit organizations are more concerned with the provision of social services and advocacy. In the current governance network, the relationship between government, market, and society is becoming more complex, and the role of nonprofit organizations is growing in importance, particularly in areas of social equity and resource distribution. Thus, exploring the intersection between public administration and nonprofit organizations has significant practical relevance.

In recent years, scholars have increasingly focused on how integrating theories and methods from different fields can achieve social equity and efficient governance. For instance, governance network theory posits that, in modern society, no single government institution can fully address public problems on its own, and the involvement of multiple stakeholders is required to enhance governance efficiency. [1]. At the same time, nonprofit organizations, as part of society, collaborate with governments to jointly shoulder social service responsibilities, contributing positively to the realization of social equity. The collaboration between public administration and nonprofit organizations in social governance is not only a critical direction for theoretical development but also a key basis for policy formulation and implementation.

This paper aims to analyze the intersection of public administration and nonprofit organization research, especially from the perspective of governance networks and social equity. It will explore the theoretical framework, research themes, and methodologies in this field, providing insights for future research and practice. The paper is structured as follows: First, it introduces the major theoretical frameworks, including systems theory, network theory, organizational theory, management theory, sociology theory, and economics theory. Next, it analyzes key research themes, such as social equity and governance networks. Following this, the paper discusses the impact of qualitative, quantitative, and mixed research methods on the field. Finally, it provides an outlook on future research trends.

2 THEORETICAL FRAMEWORK

The intersection between public administration and nonprofit organization research is based on multiple theoretical foundations. These theories provide a framework for understanding the relationship between the two fields and lay the groundwork for interdisciplinary collaboration. This paper explores the theoretical intersections from three key perspectives: systems theory and network theory, organizational theory and management theory, and sociology theory and economics theory.

2.1 Systems Theory and Network Theory

Systems theory and network theory are core frameworks in the study of public administration and nonprofit organizations. Systems theory posits that organizations or societies are interconnected wholes, with complex and dynamic relationships between their parts. It offers theoretical support for the collaboration between the public sector and nonprofit organizations. For example, the "New Public Management" theory in public administration emphasizes that governments should operate like businesses, focusing on improving efficiency and performance [2]. Similarly, nonprofit organizations, in serving society, analyze the internal collaboration and interaction between their departments using systems theory to ensure the rational allocation and efficient utilization of resources.

Network theory, on the other hand, emphasizes the connections and interactions between organizations or individuals. In modern society, individual organizations often cannot independently solve complex public problems and must collaborate within networks to balance diverse interests. Governance network theory suggests that collaboration between governments, businesses, and nonprofit organizations is an effective way to address complex social issues. In public administration, network theory is widely used to analyze the operational models of governance networks, such as how governments collaborate with nonprofit organizations to improve the quality and coverage of public services [1][3]. In nonprofit organization research, network theory is used to analyze the ways different nonprofit organizations cooperate, ensuring resource sharing and information exchange to meet evolving social needs.

2.2 Organizational Theory and Management Theory

Organizational theory focuses on the structure, culture, and behavior of organizations, providing an important perspective for understanding the operations of the public sector and nonprofit organizations. The "New Public Management" theory in public administration draws on the flat organizational structures found in business management, emphasizing that governments should reduce hierarchical layers and enhance information flow to improve decision-making efficiency [2]. Meanwhile, nonprofit organizations can use organizational theory to analyze internal leadership, cultural atmosphere, and the execution of organizational goals, thereby enhancing their adaptability and innovation. In recent years, nonprofit organizations have played an increasingly important role in public services, with research emphasizing their innovation in organizational management [4].

Management theory further focuses on improving organizational efficiency and performance, offering guidance for management practices in both the public sector and nonprofit organizations. For example, performance management theory in public policy research proposes that governments should establish scientific performance evaluation systems to improve the efficiency of public sector operations [5]. Nonprofit organizations can draw on management theory to optimize resource allocation and service processes, ensuring that limited resources are maximally directed toward target populations. Integrating interdisciplinary management theories can effectively enhance the collaborative efficiency of public administration and nonprofit organizations, creating synergy.

2.3 Sociology Theory and Economics Theory

Sociology theory provides rich tools for analyzing social backgrounds, particularly in relation to social equity and citizen participation. Sociology theory examines social structures, culture, and behavior, and the "New Public Service" theory in public administration highlights the need for governments to focus more on citizen needs and promote public participation in decision-making processes [6]. Nonprofit organizations use sociology theory to analyze their roles in society and explore how they can promote social equity and justice through services and advocacy activities.

Economics theory, meanwhile, focuses on resource allocation and efficiency, providing valuable references for financial management in the public sector and nonprofit organizations. For instance, cost-benefit analysis in public policy research uses economic methods to assess the costs and benefits of policies, offering scientific evidence for resource allocation by governments [7]. Nonprofit organizations, facing challenges in efficiently utilizing resources to achieve social goals, can optimize their use of funds under the guidance of economics theory to maximize social impact. Additionally, economics theory offers a market-based management approach for collaboration between the public sector and nonprofit organizations, improving the efficiency and effectiveness of their social services.

By integrating systems theory, network theory, organizational theory, management theory, sociology theory, and economics theory, the intersection of public administration and nonprofit organization research gains systematic theoretical support. These theories not only provide a framework for understanding the relationship between the two fields but also lay the theoretical foundation for cooperative models in practical operations.

3 RESEARCH THEMES

In the intersection of public administration and nonprofit organization research, the key themes include social equity and justice, governance networks and collaboration, organizational change and innovative management, and public participation and civil society building. These themes reflect the common concerns of both fields in theory and practice and provide researchers with interdisciplinary perspectives for theoretical innovation and practical guidance.

3.1 Social Equity and Justice in Public Administration and Nonprofit Organizations

Social equity and justice are core issues shared by both public administration and nonprofit organizations. Public administration primarily promotes social equity through the formulation and implementation of public policies. For

example, governments implement policies related to public housing, healthcare, and education to alleviate poverty and reduce social inequality [6]. Nonprofit organizations, on the other hand, play an important role in filling gaps in public services and advocating for social justice. These organizations provide social services and advocate for equity, directly assisting vulnerable groups and protecting their basic rights.

Public administration and nonprofit organizations can form complementary relationships in promoting social equity. While government policies may encounter inefficiencies or imbalances in resource allocation during implementation, nonprofit organizations can address these gaps with their flexible mechanisms and diversified service approaches. For instance, nonprofit organizations integrate resources to provide targeted services to specific groups, directly influencing the realization of social equity. This collaborative relationship enhances the coverage and effectiveness of policies, helping to create a fairer social environment.

In some areas, nonprofit organizations also play an active role in advocating for policy reform to ensure the protection of disadvantaged groups. For instance, in the field of healthcare, nonprofit organizations promote more equitable distribution of medical resources by advocating for optimized resource allocation, thus contributing to social equity and justice [13].

3.2 Governance Networks and Cross-Sector Collaboration

Governance networks and collaboration are crucial themes in the study of public administration and nonprofit organizations. In modern society, single government agencies often find it difficult to solve complex public problems on their own and need to collaborate with businesses, nonprofit organizations, and other actors to form governance networks that jointly address social challenges [2]. Governance network theory emphasizes that collaboration between different sectors can create more flexible governance models, improving the efficiency and quality of public services.

Within governance networks, nonprofit organizations often serve as key partners, participating in the formulation and implementation of public policies. Public administration can more effectively address public issues through collaboration with nonprofit organizations, especially when resources are limited. For instance, in the area of environmental governance, nonprofit organizations provide technical support, education, and advocacy to promote public participation, helping governments achieve their environmental protection goals [1].

Furthermore, cross-sector collaboration through governance networks can enhance transparency and participation in decision-making processes. By working with nonprofit organizations, public administration can gain a better understanding of the needs and opinions of various social groups, allowing for the formulation of policies that are more responsive to public demands. In governance networks, the government acts as a policymaker, while nonprofit organizations serve as both implementers and watchdogs. Their collaboration helps to develop more comprehensive and sustainable policy solutions [3].

3.3 Organizational Change and Innovative Management

Organizational change and innovative management are key avenues for improving the performance of public administration and nonprofit organizations. Government agencies, when faced with increasingly complex social problems, need to continually reform their organizational structures to improve administrative efficiency and the quality of public services. For instance, the application of information technology in public administration has led to the adoption of more intelligent and streamlined management models, resulting in the development of e-government and smart city initiatives [8].

Similarly, nonprofit organizations must innovate in their management practices to enhance their impact on social services. Nonprofit organizations can adopt new technologies and management models to increase their adaptability and service efficiency. For example, some nonprofit organizations have used social media and other modern communication tools to improve public engagement and advocacy efforts, thereby expanding their social influence [14]. In addition, nonprofit organizations need to continuously reform their internal management practices to improve transparency and flexibility, allowing them to better respond to changes in the external environment.

Through interdisciplinary research, public administration and nonprofit organizations can draw on each other's management experiences and theoretical frameworks to achieve the goals of organizational change and innovative management. Nonprofit organizations can benefit from public administration's performance management theories to optimize their resource allocation and evaluation systems, while governments can learn from the flexible management practices of nonprofit organizations to enhance the adaptability and responsiveness of public services [5].

3.4 Public Participation and Civil Society Building

Public participation and the building of civil society are important themes in the intersection of public administration and nonprofit organization research. In public administration, public participation refers to the involvement of citizens in the decision-making process of public affairs, enhancing the responsiveness of public policies and social recognition [9]. Nonprofit organizations play a vital role in promoting public participation. They mobilize the public to participate in social affairs through community organizations, public education, and advocacy activities, contributing to the development of civil society.

In modern governance systems, public administration has strengthened the role of citizens in policymaking by establishing public consultation and feedback mechanisms. For example, some government agencies use public

hearings and online platforms to gather public opinions, ensuring that policies better respond to public needs. Meanwhile, nonprofit organizations, by mobilizing community resources, help governments gain a deeper understanding of grassroots needs, improving policy implementation effectiveness [15].

The role of nonprofit organizations in building civil society is particularly evident in their work with vulnerable groups. By giving these groups a greater voice, nonprofit organizations can prompt governments to pay more attention to their needs and provide appropriate responses. For instance, some nonprofit organizations strengthen citizens' sense of social responsibility and participation awareness through community service, advocacy, and educational activities, thereby promoting civil society development. This cross-sector collaborative model of public participation helps to improve the inclusiveness and transparency of social governance [7].

4 METHODOLOGY

In the intersection of public administration and nonprofit organization research, a diversity of research methods is essential for a deep understanding of complex social issues. Qualitative research, quantitative research, and mixed-method research are widely applied in both fields, providing vital support for interdisciplinary collaborative studies. Additionally, comparative research methods serve as valuable tools for identifying the strengths and applicability of different governance models.

4.1 Qualitative Research Methods

Qualitative research methods focus on exploratory and descriptive studies, emphasizing an in-depth understanding of participants' experiences and the underlying mechanisms of social phenomena. Case studies, participant observation, and in-depth interviews are commonly used qualitative methods in the research of public administration and nonprofit organizations.

Case studies are often employed to analyze specific instances in public administration or nonprofit organizations, providing detailed descriptions of complex social phenomena. For example, in public administration, the "New Public Service" theory has utilized case studies to explore how governments can improve public service quality by listening to citizens' needs and enhancing their participation [6]. In nonprofit organization research, case studies help to analyze the internal operations of different organizations and their roles in providing social services. Through participant observation, researchers can deeply understand the internal culture and values of nonprofit organizations, especially how they enhance performance through innovative management in resource-limited contexts [14].

Qualitative research methods enable researchers to more closely analyze the collaborative models between public administration and nonprofit organizations, revealing the mechanisms and challenges of their interactions within governance networks. For example, the collaborative models between nonprofit organizations and governments may differ across countries or regions, and qualitative methods provide a deeper perspective for studying these differences [1].

4.2 Quantitative Research Methods

Quantitative research methods, through data collection and statistical analysis, help researchers uncover patterns and trends in social phenomena. In public administration and nonprofit organization research, quantitative methods are widely applied in policy evaluation, performance assessment, and public satisfaction surveys.

In public administration, quantitative research is often used to evaluate the effectiveness and efficiency of government policies. For instance, performance management theory uses quantitative indicators to assess the work efficiency of government departments, ensuring effective policy implementation [5]. Governments use surveys, statistical analysis, and economic models to evaluate the impacts of policies on different social groups, providing data to support policy optimization.

In nonprofit organization research, quantitative methods are also widely used to assess public satisfaction with organizational services. Through surveys, researchers can collect data on nonprofit organizations' performance in providing social services and draw conclusions through statistical analysis [7]. Moreover, quantitative research methods help nonprofit organizations evaluate the efficiency of resource allocation and optimize internal management processes.

Interdisciplinary quantitative research provides a scientific basis for collaboration between public administration and nonprofit organizations. For example, government agencies can evaluate the efficiency of their collaborations with nonprofit organizations using data analysis and adjust their cooperation models based on the quantitative results. Nonprofit organizations, in turn, can use quantitative data to optimize their resource allocation strategies, improving the quality and efficiency of social services.

4.3 Mixed-Method Research

In recent years, mixed-method research has gradually become a mainstream approach in the study of public administration and nonprofit organizations. Mixed-method research combines the strengths of both qualitative and quantitative research, allowing researchers to understand complex social problems from multiple perspectives.

In public administration research, mixed-method research integrates qualitative and quantitative data to enhance policy evaluation. For example, research on participatory budgeting uses a combination of qualitative interviews and

quantitative surveys to explore the needs and preferences of the public regarding government budgets. This approach reveals both the subjective experiences of participants and the actual effects of policy implementation through quantitative analysis [8].

In nonprofit organization research, mixed-method approaches help researchers comprehensively assess organizational social impact. For instance, by combining case studies with statistical analysis, researchers can explore the social influence and audience reach of specific nonprofit organizations. This method not only analyzes the innovative models of nonprofit services but also quantifies their social and economic impact [14].

The application of mixed-method research enhances the depth of research and promotes interdisciplinary collaboration. Complex policy issues often arise in government-nonprofit collaboration studies, and a single research method may not fully capture these problems. Mixed-method research provides a more comprehensive framework through multidimensional data and theoretical analysis, delivering richer research outcomes [1].

4.4 Comparative Research Methods

Comparative research methods analyze the practices of different countries, regions, or organizations, revealing commonalities and differences in public administration and nonprofit organization collaborations. Cross-national comparative research is especially important, as it identifies the strengths and weaknesses of various governance models and provides policy makers and nonprofit organizations with useful insights.

In public administration, comparative research methods are commonly used to study different public management models across countries. For example, cross-national research on "New Public Management" theory has revealed the successes and failures of government reforms in different countries, helping researchers better understand global trends in public administration [4]. Through comparative analysis, researchers can identify how different political systems, social environments, and cultural contexts influence public administration reforms.

In nonprofit organization research, comparative methods are used to analyze the operational models and performance of different types of nonprofit organizations. For instance, through comparative research, scholars can explore the developmental paths of nonprofit organizations in various countries and examine their differences in resource acquisition, organizational management, and social service provision [7]. These comparisons provide valuable references for nonprofit organizations' cross-national collaborations or localized operations.

Comparative research methods are also widely applied in studies of collaboration between public administration and nonprofit organizations. By comparing governance networks in different regions, researchers can identify the most effective collaborative models, providing theoretical support and empirical evidence for interdisciplinary research [15]. This method not only helps improve the quality of public services but also fosters policy innovation and social transformation.

5 CONCLUSION AND OUTLOOK

This paper systematically explores the intersection of public administration and nonprofit organization research, particularly from the perspective of governance networks and social equity. It analyzes the synergy and convergence between these two fields in terms of theoretical frameworks, research themes, and methodologies. Through the integration of systems theory, network theory, organizational theory, management theory, sociology theory, and economics theory, we gain a deeper understanding of the collaborative relationship between public administration and nonprofit organizations, providing theoretical support for interdisciplinary research between the two.

In terms of research themes, social equity and justice, governance networks and cross-sector collaboration, organizational change and innovative management, and public participation and civil society building are the main intersections between public administration and nonprofit organization research. These themes not only reflect the theoretical integration between disciplines but also provide researchers with new directions for exploring public governance and social service innovation. By analyzing how social equity manifests in both fields, we can better understand how multi-stakeholder collaboration enhances social justice. In governance networks and collaboration research, nonprofit organizations, as key members of governance networks, can work together with governments to solve social issues. Additionally, organizational change and innovative management, public participation, and civil society building provide new perspectives and pathways for improving public service quality and social governance.

In terms of methodology, qualitative, quantitative, and mixed research methods play essential roles in the study of public administration and nonprofit organizations. These methods not only offer researchers different perspectives for analysis but also lay a solid foundation for empirical research in interdisciplinary collaboration. Qualitative research methods delve into case studies and participants' experiences, revealing the complex collaborative mechanisms between public administration and nonprofit organizations. Quantitative research methods, through data analysis, demonstrate the effectiveness of policies and the performance of nonprofit organizations in social service provision. Mixed-method research combines the strengths of both qualitative and quantitative methods, offering researchers a more comprehensive framework for analyzing complex issues. Additionally, comparative research methods, by examining different countries, regions, or organizations, provide valuable practical references for policymakers and organizational managers.

5.1 Theoretical Contributions

This paper presents three major theoretical contributions through the exploration of the intersection between public administration and nonprofit organization research, particularly from the perspective of governance networks and social equity:

First, by combining systems theory and network theory, this paper reveals the complex interactive relationships between public administration and nonprofit organizations within governance networks. The research indicates that public administration and nonprofit organizations have evolved from a relationship of a single policy executor and overseer to governance network members collaboratively solving complex social problems. This theoretical contribution calls for further research into the cross-sector collaboration mechanisms within governance networks.

Second, the paper combines sociology theory and economics theory, emphasizing the importance of social equity and justice in the research of public administration and nonprofit organizations. Particularly in the areas of resource distribution and service provision, nonprofit organizations effectively fill the gaps in public services through collaboration with the government, thereby promoting the realization of social equity. This theoretical contribution provides valuable insights for future research in public service and social security fields.

Finally, the paper highlights the potential of mixed-method research in interdisciplinary studies within public administration and nonprofit organizations. Mixed-method research not only integrates the advantages of qualitative and quantitative research but also provides a solid foundation for multi-angle analysis of complex issues. In particular, when studying the implementation of public policies and social services, mixed-method research offers researchers more refined analytical tools.

5.2 Practical Implications

On the practical level, the findings of this paper provide several implications for the collaboration between public administration and nonprofit organizations:

First, the establishment and improvement of governance networks require close cooperation between governments and nonprofit organizations. Nonprofit organizations' flexibility and innovation in social services can effectively supplement government deficiencies in public service provision. Policymakers should encourage the participation of nonprofit organizations in the design and implementation of public service projects, enhancing the coverage and quality of social services through tighter cooperation mechanisms.

Second, nonprofit organizations should further leverage their unique advantages in resource integration and service provision for vulnerable groups in promoting social equity and justice. Governments can enact policies that encourage nonprofit organizations to play a larger role in sectors such as education, healthcare, and social security, jointly fostering a more equitable and just society.

Third, public administration and nonprofit organizations should draw from each other's organizational management experiences, continuously pursuing organizational change and innovation. Nonprofit organizations can adopt public administration's performance management systems to optimize their internal management processes and improve resource utilization efficiency. Governments, on the other hand, can learn from the innovation mechanisms of nonprofit organizations to enhance the adaptability and responsiveness of public services.

5.3 Future Research Directions

Although this paper provides a comprehensive discussion of the theoretical and practical aspects of the intersection between public administration and nonprofit organizations, some areas warrant further exploration:

First, the issue of collaboration between public administration and nonprofit organizations in cross-national governance networks requires more empirical research to reveal the differences in collaboration models across countries and regions. This will help provide more systematic solutions to global governance challenges.

Second, with the rapid development of information technology, the collaborative models between public administration and nonprofit organizations are constantly evolving. Future research should focus on the application of digital technology in improving the efficiency and quality of public services, particularly how technological tools can be used to enhance the transparency of governance networks and diversify public participation.

Finally, future studies should continue to explore the roles of public administration and nonprofit organizations in the realization of social equity, especially in the context of globalization, where the cross-border flow of resources and the diverse needs for social services present new challenges and opportunities for collaboration between these two fields.

COMPETING INTERESTS

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REFERENCES

[1]   Bodin Ö, Mancilla García M, Robins G. Reconciling conflict and cooperation in environmental governance: a social network perspective. Annu Rev Environ Resour, 2020, 45(1): 471-495.

[2]   Wang H, Ran B. Network governance and collaborative governance: a thematic analysis on their similarities, differences, and entanglements. Public Manag Rev, 2021, 25(6): 1187-1211.

[3]   Farazmand A, editor. Global encyclopedia of public administration, public policy, and governance. Springer Nature; 2023.

[4]   Bryhinets OO, Svoboda I, Shevchuk OR, et al. Public value management and new public governance as modern approaches to the development of public administration. Revista San Gregorio, 2020, 1(42): 205-214.

[5]   Roy S, Bahuguna PC, Rawat N. Performance management in public sector organizations: A bibliometric analysis. Int J Organ Leadership, 2023, 12(Special Issue): 115-141.

[6]   Qian W, Liu H, Pan F. Digital economy, industry heterogeneity, and service industry resource allocation. Sustainability, 2022, 14(13): 8020.

[7]   Soelton M, Noermijati N, Rohman F, et al. Improving the performance of nonprofit organizations? Acad Strateg Manag J, 2021, 20: 1-13.

[8]   Rakšnys AV, Valickas A, Vanagas R. Challenges of creation and implementation of collaborative innovations in public sector organisations. Public Policy Adm, 2020, 19(1): 9-21.

[9]   Trein P, Biesbroek R, Bolognesi T, et al. Policy coordination and integration: A research agenda. Public Adm Rev, 2021, 81(5): 973-977.

[10] Vu TA, Plimmer G, Berman E, et al. Performance management in the Vietnam public sector: The role of institution, traditional culture and leadership. Int J Public Adm, 2022, 45(1): 49-63.

[11] Nkrumah Agyabeng A, Preko A. A stakeholder analysis of government policy intervention in the Ghanaian slum communities. Hous Care Support, 2021, 24(2): 41-53.

[12] Kuhlmann J. Mechanisms of policy transfer and policy diffusion. In: Handbook of policy transfer, diffusion and circulation. Edward Elgar Publishing, 2021, 43-57.

[13] Yang MX, Niu SR. Chromosome karyotyping by G-banding in peripheral blood lymphocyte cultures of 5309 couples with adverse reproductive history. J Youjiang Med Coll Nationalities, 2019, (5): 520-522.

[14] Huang N, Liu YP, Xu ZF, et al. Study on the relationship between syndrome differentiation types, tongue features, and gastroscope results in active peptic ulcer. J Youjiang Med Coll Nationalities, 2018, (5): 466-468, 471.

[15] Rao ZF, Chen JY, Zhao LY, et al. Comparison of ultrasound-guided microwave ablation and laparoscopic resection for benign thyroid nodules. J Youjiang Med Coll Nationalities, 2018, (6): 583-585.