

# Analysis of a New Service Model for Time Banking in Pension Services: A Case Study of Guangdong Province, China

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Information of Article	ABSTRACT
<p><i>Article history:</i> Received: Jul 2024 Revised: Aug 2024 Accepted: Sep 2024 Available online: Oct 2024</p> <p><b>Keywords:</b> Time bank Elderly Care Service Service Model Guangdong Province Adaptability Analysis</p>	<p>As population aging intensifies, traditional elderly care models struggle to meet rising demand. Time banking, an innovative model of social mutual assistance, addresses this by enabling elderly care services through time exchanges among members, offering both economic and social benefits. This model has emerged as a significant trend in elderly care services. Using Guangdong Province as a case study, this paper provides a comprehensive analysis of the new time banking service model. It begins with an overview of time banking research, both domestically and internationally, and explores the relevance and value of this model in elderly care amid Guangdong's aging population. A framework for a novel time banking service model is then proposed, detailing its theoretical foundation, operational processes, management mechanisms, and the specific challenges it faces in elderly care services in Guangdong. The study includes an empirical evaluation of implemented time banking cases in Guangdong, assessing their operational status, effectiveness, feasibility, and practical challenges. Based on both theoretical and empirical insights, this paper summarizes the advantages and limitations of time banking in elderly care services in Guangdong and offers policy recommendations to foster sustainable development of time banking within an aging society. This study not only contributes insights for advancing the time banking model in Guangdong and other Chinese provinces but also serves as a valuable reference for innovating elderly care models in other regions.</p>

## 1. Introduction

### 1.1 Proposal and Development of the Time Banking Concept

#### 1.1.1 Origin and Development of Time Banking

Time banking emerged in the late 20th century as an innovative model for exchanging social services to address social isolation and low participation among the elderly. Initially designed as a non-monetary system, time banking fosters mutual support within communities by exchanging time rather than money, thus creating an interdependent and supportive environment. Operating on the principle that one person's service time can be exchanged for time contributed by others, time banking gained early traction in countries like the United States and Japan and has since expanded across Europe, Asia, and other regions. Amidst aging populations, many countries now explore time banking as a potential solution for pension services, increasing elderly participation in community activities and alleviating traditional elderly care's financial strain on governments (Chen, 2022). In Japan, where an advanced welfare system contends with a high aging rate, time banking has become a prominent model in elderly care services. Studies reveal that time banks strengthen mutual aid among community members, boost social engagement for the elderly, and enhance community cohesion. However, challenges remain, including organizing activities, motivating participants, and designing regulatory and incentive mechanisms. Although data on time bank development remains limited, existing studies and case analyses indicate that time banks can reduce welfare costs while offering value-added services. In Japan, time bank participants report receiving essential services, expanding their social networks, and enhancing social engagement (Zhao, 2021).

#### 1.1.2 Global and Domestic Status of Time Banking

Time banking, a mutual aid-based service exchange system, enables participants to earn credits through time contributions, redeemable for future assistance. Since Professor Edgar Cahn introduced it in 1995, time banking has become widely applicable, especially in elderly care, healthcare, education, and community development. In developed

countries like the United States, the United Kingdom, and Japan, time banking systems have matured significantly (Xu, 2020). By 2022, Time banking UK managed nearly 300-time banks with over 40,000 members, expanding its initiatives into areas like environmental protection and community revitalization. In Japan, time banking addresses its substantial aging challenges. In China, time banking is relatively recent yet has expanded rapidly in first- and second-tier cities due to increasing aging rates and advancements in internet technology. Since 2016, pilot projects in Guangdong Province have leveraged digital technology to improve service transparency and efficiency, yielding significant social benefits. However, challenges remain, including financial support, management, legal frameworks, and fostering social trust. Specifically, integrating time banking with China's local culture and family structures requires further exploration, and gaps in insurance, tax, and legal systems hinder its widespread adoption. Nevertheless, with policy support and technological advancements, time banking is poised to expand into broader applications, addressing aging and fostering community development (Song, 2021).

## *1.2 Research Background and Significance*

### *1.2.1 Elderly Care Services in Guangdong Province*

With global aging accelerating, healthy aging has become a strategic goal worldwide. As life expectancy rises and birth rates fall, aging presents a major challenge globally. A region is considered “aging” when over 7% of its population is 65 or older, “aged” at over 14%, and “super-aged” at over 20%. Healthy aging aims to extend the healthy lifespan of the elderly, improving quality of life beyond merely preventing disease. The World Health Organization defines health as encompassing physical, mental, and social well-being. Many countries have integrated healthy aging into development strategies, emphasizing elderly quality of life and minimizing illness periods. Guangdong Province exemplifies a rapidly aging region in China, with 12.6% of its population now aged 65 or older. As traditional family-based elderly care models struggle to meet the demand, establishing a socialized elderly care system has become a priority. Guangdong's elderly care services are transitioning from home-based to community-based models, but service quality, trained professionals, and information systems still require improvement. To address these challenges, Guangdong has begun exploring innovative models like time banking to enhance elderly care quality and social participation (Song, 2019).

### *1.2.2 Importance of Time Banking in Elderly Care in Guangdong Province*

Guangdong and other Chinese regions face growing elderly care challenges due to changing population structures and economic growth. By the end of 2020, Guangdong's population over 60 surpassed 14.73 million, or 14.6% of the population—exceeding the national average. Time banking offers a critical solution to these needs by providing personalized and flexible elderly care services through a mutual aid system, enhancing social value and accomplishment for the elderly (Chen, 2016). By fostering intergenerational connections, time banking strengthens ties between younger and older generations while modernizing the traditional culture of filial piety. Economically, time banking can reduce Guangdong's elderly care burden, promote diversified service development, and support social stability and sustainable economic growth. Time banking integrates community resources and provides innovative elderly care strategies, blending traditional culture with modern service methods. In sum, time banking in Guangdong supports elderly care needs, promotes innovative models, and offers valuable insights for sustainable development (Wu, 2015).

## *1.3 Study Purpose and Content*

### *1.3.1 Study Purpose*

This study aims to assess the feasibility of time banking as an innovative elderly care model in Guangdong Province, analysing potential operational challenges. It also examines time banking's influence on traditional elderly care systems, elaborating on its concept, theoretical foundation, and operational mechanisms to provide a basis for elderly care strategies in Guangdong (Li, 2014). By evaluating Guangdong's elderly care services, this study identifies existing challenges and assesses time banking's potential to address them. The study evaluates time banking's implementation in Guangdong, exploring its impact across age groups and its role in improving elderly care efficiency and quality. Based on empirical findings, the study offers recommendations to refine the model and guide policymakers in fostering sustainable elderly care development in Guangdong (Li, 2012).

### *1.3.2 Study Content and Chapter Outline*

This study explores time banking's potential and practical impact as an elderly care model in Guangdong. Through rigorous analysis and empirical research, we design a time banking model tailored to Guangdong's social and economic context, evaluating its effectiveness in practice. Chapter 1 introduces time banking's concept and its relevance to

modern elderly care, followed by an analysis of global and regional implementations. Chapter 2 reviews literature on time banking's theoretical foundations, operational mechanisms, benefits, and applications in elderly care, highlighting gaps specific to Guangdong's needs. Chapter 3 constructs a time banking model for Guangdong, analysing its adaptability within the province's socio-economic context, and addressing challenges and solutions. Chapter 4 presents an empirical evaluation of time banking cases in Guangdong, assessing management structures, service outcomes, and key insights. Chapter 5 concludes the study, offering policy recommendations and future research directions, proposing an effective time banking model for elderly care and policy guidance for Guangdong and other regions.

### *1.3.3 Research Questions*

1. How feasible is time banking as an innovative elderly care model in Guangdong Province, and what challenges might arise in its implementation?
2. What impact does time banking have on traditional elderly care systems, and what are its conceptual and theoretical underpinnings?
3. How does time banking address current challenges in Guangdong's elderly care services, and what are its potential outcomes?
4. What effects does time banking have on different age groups in Guangdong, and how does it improve elderly care efficiency and quality?
5. What policy and operational recommendations can empirical analysis provide to optimize the time banking model for sustainable elderly care in Guangdong Province?

## **2. Literature Review**

### *2.1 Review of Time-Banking Theory Research*

#### *2.1.1 Basic Principles of Time Banking*

Time banks facilitate equal service exchanges by using time as a currency, where each participant, regardless of occupation or social status, contributes value equally, embodying social equity. Often organized by communities or through online platforms, time banks rely on information technology for transaction records and time credit management, fostering participatory democracy, resource sharing, and strengthening community cohesion (Shu, 2010). Globally, time banking practices, such as those by Time Banking UK and U.S. time banking communities, play vital roles in promoting community development and mutual support among residents. In China, time banking has emerged as an innovative response to the aging population, enhancing the quality of life for the elderly and alleviating the pressure on traditional elderly care services. However, challenges persist in ensuring service quality, fairness, operational sustainability, and integration with the broader social welfare system. Effective time banking relies on the collaboration of governments, social organizations, and public engagement to address these issues (Chen, 2024).

#### *2.1.2 Service Models of Time Banking*

Time banking is an innovative mutual-aid pension model based on time exchange, where individuals accumulate time credits through services they provide, redeemable for future assistance. This model enhances community cohesion, improves resource utilization efficiency, and complements traditional elderly care. The main time banking models include:

1. **Mutual Aid:** Community members earn and use time credits through volunteer services.
2. **Incentive-Based:** Attracts more participants through material or spiritual rewards.
3. **Professional Matching:** Emphasizes professional skills for high-quality service, ideal for settings with stringent service requirements.
4. **Collaborative Model:** Allows multiple time banks or organizations to cooperate, expanding the service range.

In different countries, time banking has evolved uniquely. Japan has a mature model, while Europe and the U.S. emphasize community services. Despite progress, challenges include regulatory complexities, service quality, and limited participation. Proposed solutions involve third-party regulation and government subsidies. The adaptability of time banks allows for continuous improvements to better serve future societal needs in elderly care.

### *2.2 Research on Elderly Care Service Models*

#### *2.2.1 Traditional Elderly Care Service Models*

Traditional elderly care includes family care, community support, and basic medical security. Family care depends on support from family members, which is economically efficient but highly dependent on family resources. With the aging population, changing family structures, and increased female workforce participation, family care is becoming less feasible (Nie, 2024). Community support provides neighborhood-based mutual assistance, supplementing family care, but uneven resources and a shortage of professionals hinder the formation of an effective service network. Government-provided medical security offers basic medical services, but coverage and service quality remain low in remote areas, such as rural regions (Yu and Xiao, 2024). As aging progresses, traditional care models face issues like misallocation of resources, low service quality, and lack of personalized care, making it challenging to meet elderly needs. Scholars suggest a synergy among family, community, government, and market resources to improve service quality, establish a diversified elderly care system, and support the development of the elderly care industry (Zhang, Cao and Li, 2024).

### *2.2.2 Innovations in Modern Elderly Care Models*

With societal and economic development and the rising aging population, traditional family-based elderly care struggles to meet diverse needs, prompting new care models. Modern elderly care includes:

1. Home Care: Preferred by over 70% of the elderly, integrating wearable devices and monitoring systems for real-time health tracking and telemedicine consultations.
2. Community-Based Care: Allows the elderly to remain in familiar settings, offering services such as cultural education, sports, entertainment, and psychological support to reduce loneliness.
3. Institutional Care: Enhances traditional models with IoT and other technologies, providing a safer and more comfortable environment.
4. Internet + Care: Uses online platforms and information technology to increase service availability and personalization, meeting the elderly's varied needs.

By integrating technology with traditional services, modern elderly care models enhance service quality and efficiency, addressing personalized and diverse elderly care needs.

## *2.3 Review of Related Studies*

### *2.3.1 Evaluation of Time Banking in Elderly Care*

Time banking, an innovative mutual-aid model, is widely used in developed countries. Its fundamental concept is to store and exchange time through mutual assistance, preparing participants for future care needs. In elderly care, time banking has strengthened community mutual aid, facilitated intergenerational communication, improved service efficiency and coverage, and positively impacted the elderly's social participation and quality of life (Cheng and Xue, 2024). The effectiveness of time banking in elderly care is mainly evaluated in terms of efficiency and participant satisfaction. For instance, a study in Milan, Italy, found that time banking activities significantly reduced long-term care costs, alleviated loneliness, and improved life satisfaction among participants. However, further empirical studies are needed to confirm the model's long-term effectiveness and universality (Wang, Li and Liang, 2024). Challenges in implementing time banking include ensuring volunteer reliability, achieving service standardization, and addressing service quality and accessibility issues, which affect sustainability. Social and cultural factors also impact time banking's acceptance and effectiveness. For example, the models used in Japan and Sweden reflect variations due to different social, cultural, and institutional contexts (Huang, Duan and Li, 2024). Policy and regulatory support are essential for time banking. This includes privacy protection, tax policy incentives, and appropriate participant incentives. For example, Japan's introduction of the "NPO legal person" system facilitates time banking operations, while the U.S. tax exemption policies support its financial viability. The application of time banking in elderly care shows promise globally. However, addressing service quality, sustainability, and institutional support is essential for broader adoption. With the intensifying aging issue, time banking, as an effective mutual-aid model, is expected to become a significant field of social innovation.

### *2.3.2 Research Status of Elderly Care Services in Guangdong Province*

As a highly developed region, Guangdong faces significant challenges from its aging population, with individuals over 60 comprising more than 17% of the population. Guangdong has implemented various elderly care models, including family, institutional, community, home care, and Internet-based services, encouraging social capital participation to increase care service supply. However, the distribution of elderly care resources between urban and rural areas remains uneven, with lower service quality and a shortage of professionals, especially in rural regions with underdeveloped facilities. To improve service accessibility and quality, Guangdong has integrated smart elderly care through modern

information technology, offering online consultation and remote diagnosis. Although these initiatives have achieved positive results, maintaining sustainability in elderly care requires continued alignment of policy and practice to meet future demands.

### 2.3.3 Conceptual Framework and Roadmap

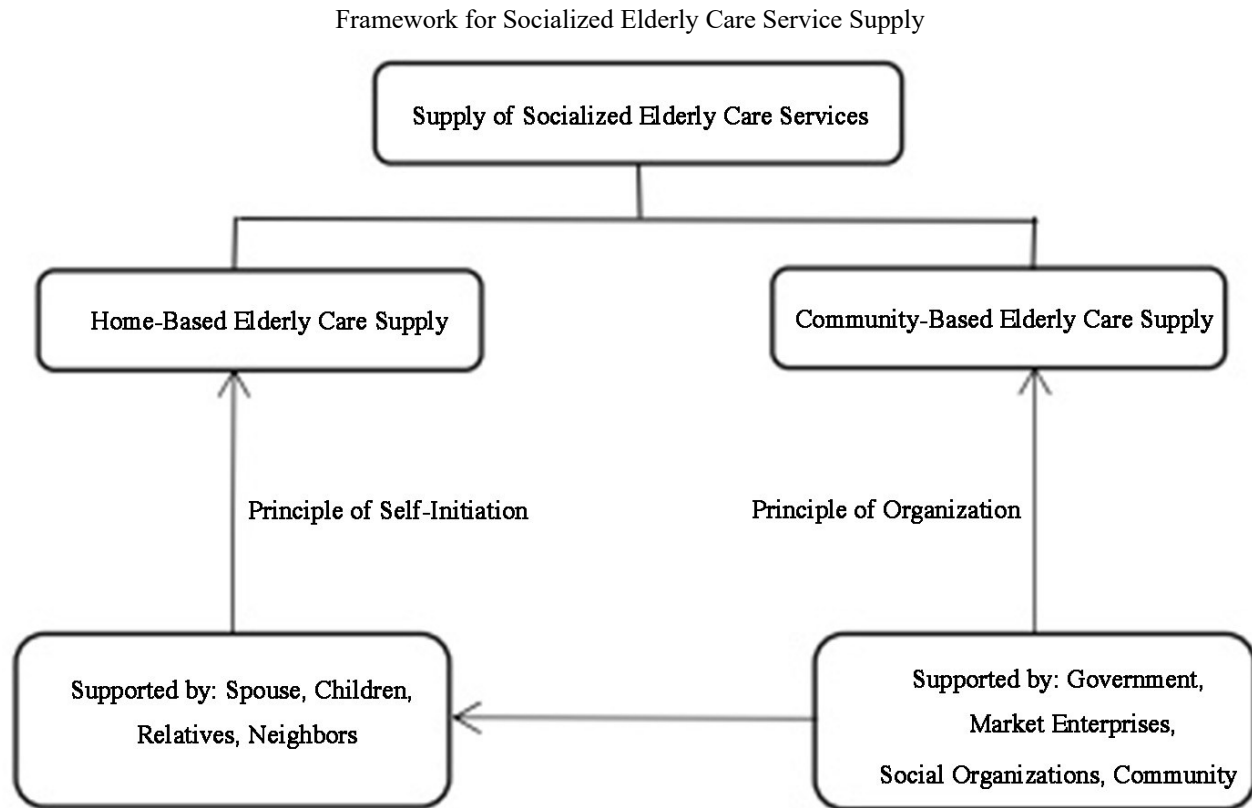


Figure 1: Technical roadmap of the paper

## 3. New Service Model and Adaptability Analysis

### 3.1 Discussion on the New Service Model of Time Banking

#### 3.1.1 Theoretical Basis for Model Construction

With the evolution of the social economy and demographic shifts, traditional pension models struggle to meet the diverse needs of the elderly. Time banking, as an innovative approach to elderly care, has gained significant attention. Its core principle is to enhance the sharing of social resources and improve elderly care efficiency through the accumulation and exchange of time credits. The theoretical foundations of time banking include:

1. Social Exchange Theory: Emphasizes non-material exchange; time banking encourages community members to provide services to each other through a reciprocity mechanism, optimizing resource allocation.
2. Time Value Theory: Views time as an exchange medium, allowing community members to contribute time in exchange for services.
3. Mutual Aid Theory: Strengthens community support and mutual assistance, enhancing the quality of life for the elderly and promoting social harmony.
4. Sustainable Development Theory: Ensures the sustainability and adaptability of elderly care services through collective participation and continuous service updates.

In Guangdong Province, where the population aged 60 and above has reached 17.1%, promoting the time-banking model can enhance social engagement and service quality for the elderly, contributing to a harmonious aging society. Model design should consider fairness, point management, and legal support to align with social needs and regional characteristics.

### *3.1.2 Components of the New Service Model*

Key components of the time banking model include the concept of time currency, service delivery and acceptance mechanisms, mutual assistance systems, supervisory and incentive mechanisms, and support from information technology. These elements are essential for effective operation and sustainable development.

1. **Time Currency Concept:** Uses time instead of money for exchange, ensuring equitable time value. Exchange rates should be informed by social research and demand analysis.
2. **Service Delivery and Acceptance Mechanism:** Establishes a smooth platform for matching service providers with demanders, ensuring services are demand-driven rather than supply-oriented.
3. **Mutual Aid and Symbiosis System:** Promotes cooperation and resource sharing among community members, enhancing resource efficiency and community cohesion.
4. **Supervisory and Incentive Mechanism:** Establishes rules and regulations, monitors service quality, and incentivizes participation through rewards and point systems.
5. **Information Technology Support:** Optimizes service matching and demand forecasting using mobile apps, cloud computing, and big data analysis. Guangdong's high internet and mobile payment penetration rates support these technological needs.

By integrating these components, an effective time banking model can address the diverse elderly care needs in Guangdong and improve service efficiency and quality.

## *3.2 Adaptability Analysis of the Time-Banking Model in Guangdong Province*

### *3.2.1 Analysis of Elderly Care Demand in Guangdong Province*

As society rapidly evolves and the aging population grows, Guangdong's elderly care system faces significant challenges. By the end of 2022, individuals aged 60 and over made up 17.6% of Guangdong's population, with this proportion expected to continue rising. Despite economic growth attracting young labor, aging remains a major issue, with the elderly's health and care needs increasingly requiring high-quality, personalized services. The elderly in Guangdong seek various services, including health care, home care, community support, and institutional care. Demand for home care includes assistance with daily activities, housekeeping, and medical services. Currently, service availability does not fully meet these diverse needs, especially in economically disadvantaged areas where professional care institutions and skilled personnel are scarce. While elderly care facilities and services have increased, they still fall short of demand. The lack of personalized services and limited offerings restricts the sector's ability to meet the elderly's multi-level needs. To adapt to modern elderly care expectations for personalized, high-quality services, Guangdong needs to reform its care system by diversifying and professionalizing services and optimizing supply structures. The time-banking model offers potential for improving service efficiency and expanding offerings, particularly for home care.

### *3.2.2 Social and Economic Environment Adaptability Analysis*

As one of China's economic powerhouses, Guangdong has a strong foundation for implementing the time-banking model. High disposable incomes, robust social spending capacity, and extensive economic resources support financial assistance, material allocation, and technological advancements for time banking. Guangdong's per capita GDP exceeds \$10,000, reflecting a growing demand for quality elderly care services. The time-banking model can cater to this increasing demand. Guangdong's elderly population continues to rise, with those aged 65 and above surpassing the national average. Rich labor resources and a socially inclusive culture support time banking's expansion. High informatization levels in the Pearl River Delta region further boost service efficiency. However, rural and mountainous areas with lower levels of digital infrastructure may face challenges. Guangdong should consider regional disparities

during implementation, adopting differentiated strategies to ensure the effective roll-out and broad benefits of time banking.

### *3.3 Challenges and Strategic Solutions*

#### *3.3.1 Barriers to the Development of Time Banking in Guangdong*

While Guangdong's time banking initiatives have positively impacted elderly care, several obstacles impede progress:

1. **Lack of Public Awareness:** Over 60% of surveyed elderly are unfamiliar with time banking's concept and operation, limiting its adoption.
2. **Insufficient Legal Support:** A lack of comprehensive legal frameworks for regulating time banking operations, time value determination, and dispute resolution impacts participant rights.
3. **Limited Technology and Infrastructure:** Incomplete internet coverage in some rural and peri-urban areas, along with low digital literacy among the elderly, reduces time bank utilization.
4. **Weak Incentive Mechanisms:** Inadequate material and moral incentives lead to low volunteer participation, with participation rates below 20% in some Guangzhou communities.
5. **Challenges in Service Quality Management:** Services often rely on non-professional volunteers; insufficient training and standardization result in variable service quality.

To advance time banking in Guangdong, these issues need to be addressed through improved system design, increased investment in capital and technology, and enhanced service quality.

#### *3.3.2 Strategic Solutions and Policy Recommendations*

To promote time banking in Guangdong, several strategic and policy adjustments are necessary:

1. **Establish a Provincial Steering Committee:** This committee would oversee planning, monitoring, and information sharing, coordinating time-banking projects, solving volunteer-service mismatches, and regularly updating service standards.
2. **Create Incentive Policies:** Encourage participation through financial subsidies, tax incentives, and integrate time-banking services with social insurance to provide long-term benefits.
3. **Enhance Public Awareness:** Use new media, lectures, and community seminars to raise public awareness. Encourage schools to incorporate time-banking education to foster a culture of volunteerism among younger generations.
4. **Integrate Technological Innovation:** Utilize big data, cloud computing, and other technologies to develop intelligent matching systems, improving service efficiency and management.

These measures will effectively address strategic challenges, supporting the healthy and sustainable development of time banking in Guangdong Province.

## **4. Empirical Analysis**

### *4.1 Operational Process and Management Mechanism of the Time Banking Model*

#### *4.1.1 Model and Process of Elderly Care Services in Time Banking*

1. **Registration:** Users provide personal information and service requirements for registration. Guangdong Province offers both online platform registration and offline community service center registration to ensure accurate service matching.
2. **Service Matching:** Big data and intelligent algorithms are used to match users with service providers based on needs. Once matched, the system notifies the user to confirm the service type and timing.
3. **Time Currency Transactions:** Service hours provided are converted into time currency points, which users can exchange for services from others in the future.

4. **Service Provision:** Service providers deliver agreed-upon services, such as companionship or household assistance. Guangdong Province offers multi-level, specialized services to meet diverse needs.
5. **Evaluation and Feedback:** After service completion, both parties provide feedback through the platform to enhance service quality and fairness. Some projects in Guangdong use two-way anonymous evaluations.
6. **Management and Supervision:** A management committee, comprising government representatives, community members, and third-party institutions, oversees user registration, time currency circulation, and service quality control.

Data from Guangdong's Time Bank initiative—such as 3,000 users and over 20,000 service hours in 2019—demonstrate the model's social impact and effectiveness. Despite challenges such as user trust and service quality consistency, the model is expected to expand as policy and technology continue to improve.

#### *4.1.2 Management and Operational Mechanisms of the Time Bank*

The management and operation of the time banking model in Guangdong Province are crucial to its success. Key aspects include organizational structure, role definitions, service process specifications, and quality control.

1. **Organizational Structure:** Led by the government, operated by social organizations, and supported by the market. The government sets policies, regulates, and provides financial support, while social organizations manage service platforms, and market participation enhances service options.
2. **Participant Roles:** The government provides policy and financial support; service providers offer professional services; service users have choices; and volunteers earn time currency by providing services.
3. **Service Process Specification:** Includes needs assessment, planning, implementation, and outcome evaluation to ensure standardization, quality control, and protection of elderly rights.
4. **Quality Control:** Service quality is continuously improved through regular training, evaluations, feedback, and complaint handling.
5. **Operational Mechanism:** Service providers accumulate time currency, calculated in hours, which users can then exchange for services. This mechanism optimizes community resource utilization.
6. **Incentive System:** Volunteers are incentivized through time currency, community recognition, and skills training to encourage participation.
7. **Risk Management:** A credit system, transaction limits, and ethics training minimize risks. Data analysis supports policy development.

These mechanisms enhance resource allocation, foster community-based elderly care services, protect participants' rights, and encourage innovation. The management and operational framework in Guangdong's Time Bank optimize resource use, supports elderly care service development, and protects participants' rights. Continuous improvements in these mechanisms provide a foundation for the sustainable growth of time banking and foster innovation in elderly care models.

#### *4.2 Case Analysis of Guangdong's Time Banking Initiative*

##### *4.2.1 Case Selection and Analysis Method*

This study employs an empirical approach to analyze the time banking model in Guangdong Province, examining its operational background, policy support, and current performance through diverse data collection methods. Several community time bank projects were selected based on factors such as project duration, resident participation, service diversity, and contributions to elderly care services. These cases represent various stages of time banking development. We combined qualitative and quantitative methods, including in-depth interviews and data analysis using SWOT analysis and comparative research. An evaluation index system provided quantitative assessment. For example, data showed that a community program engaged over 200 elderly individuals, contributing more than 10,000 hours of service, with over 90% reporting improved quality of life after participating. This study also assesses the sustainability of time-banking programs by analyzing financial statements, capital flows, and human resources, providing insights into the long-term viability of each program.



#### *4.2.2 Analysis and Summary of Typical Cases*

In our analysis of Guangdong's time banking model, we focused on two typical cases: a home care service platform and a community-based time bank. These cases illustrate the model's application in different elderly care settings. After implementing the time-banking model, participants reported improved social engagement and service efficiency, with 70% expressing satisfaction with their experience. Time banking has boosted self-esteem and belonging among the elderly and optimized service supply and demand. The community-based time bank incentivizes elderly participation through point exchange, where individuals earn time currency by providing services and later redeem it when in need. Ninety percent of elderly participants expressed willingness to participate again, highlighting increased community cohesion and social network formation. Time currency has enhanced quality of life, reduced service waits times by approximately 30%, and improved service satisfaction. However, these cases also reveal challenges facing time banking, such as limited-service variety, focusing primarily on medical assistance, domestic maintenance, and social activities. Standardization of management and operations is needed, along with improved service quality and professional training for participants. The findings suggest that time banking has significant potential in elderly care. Future efforts should expand service types, establish management standards, and strengthen training to better meet the varied needs of the elderly.

#### *4.3 Effectiveness Assessment and Sustainability Analysis*

##### *4.3.1 Service Effectiveness Evaluation*

To assess the effectiveness of time banking in Guangdong, data was collected through surveys, interviews, and participant observation. Of the 500 distributed questionnaires, 480 were valid, with a 96% response rate. Results indicate that the time banking model significantly enhances social networks, with 75% of users reporting increased social activity and 80% feeling a stronger sense of community. In terms of service quality, user satisfaction rose significantly: satisfaction with response speed increased from 6.5 to 8.3, and professionalism improved from 5.8 to 7.9. Paired sample t-tests confirmed that improvements in response speed satisfaction were statistically significant ( $p < 0.05$ ). Time banking also enhances social value by engaging various community members, such as students and homemakers, in voluntary services, creating a diversified support network. According to the survey, 98% of community residents view time banking positively, believing it fosters neighborly relations and community cohesion. Future efforts should continue optimizing service quality and management to enhance elderly care in Guangdong and potentially across China.

##### *4.3.2 Sustainability Analysis*

Ensuring the sustainability of the time banking model is essential for long-term success. The sustainability analysis considers economic benefits, social impact, and environmental adaptability, factoring in Guangdong's specific context.

1. **Economic Benefits:** By mobilizing community resources and volunteers, time banking enhances service efficiency. Data show that service exchanges have increased annually, with volunteer service hours growing by 10% each year and service value rising from 20 to 25 yuan. However, economic benefits rely on adequate investment in management, including human resources and marketing.
2. **Social Impact:** Time banking fosters community cohesion and enhances social participation among the elderly. Data reveal that 75% of elderly participants reported an increased sense of social engagement and community belonging, promoting intergenerational interaction.
3. **Environmental Adaptability:** With digital technology integration, time banking has become more flexible. However, senior-friendly service platforms and technical support are needed to increase model accessibility for older adults who may be less familiar with technology.

Overall, the sustainability of the time banking model in Guangdong is influenced by multiple factors. Recommendations include strengthening quantitative analysis of economic benefits, establishing long-term incentive mechanisms, promoting diverse elderly care models, enhancing social awareness, and leveraging technology to

optimize service processes and provide technical training. These actions can further advance the sustainable development of Guangdong's time banking model.

## **5. Discussion and Conclusions**

### *5.1 Conclusion*

#### *5.1.1 Effectiveness of the New Time Banking Model for Elderly Care*

This study evaluated the effectiveness of the new time banking model in Guangdong Province. The data demonstrate that this model has clear advantages in meeting the diverse needs of the elderly, improving service efficiency, and fostering community support networks. Participation rates increased significantly, from 5% at the beginning of implementation to 25%, reflecting the model's appeal and its expanded reach in elderly care services. Additionally, user satisfaction with time banking is generally higher than with traditional elderly care services. The model's personalized and flexible services enhance the autonomy and well-being of elderly users. Resource utilization has also seen notable improvement, with service hours increasing by 50% and service providers' time utilization rising by 30%, effectively easing the strain on elderly care resources. Furthermore, the time banking model promotes community cooperation and mutual support, providing emotional and practical help to the elderly and building important social capital. Although the model has shown positive results in enhancing service quality and resource efficiency, challenges remain, such as insufficient policy support, uneven participant quality, and a limited-service scope. Continuous optimization and policy support are needed to address these issues.

#### *5.1.2 Key Findings on the Time Banking Model in Guangdong Province*

The study's analysis reveals the actual impact and potential value of the time banking model in elderly care. The model alleviates resource shortages through time-based mutual assistance, enhancing the elderly's social participation and quality of life. Data indicate that elderly participants in time banks report a more positive outlook and improved psychological well-being, with 70% experiencing expanded social networks and 65% feeling a greater sense of dignity. Time banking also strengthens community bonds and builds social capital by fostering trust and support among members. However, the model faces practical challenges, including an imperfect incentive structure, low standardization of services, and insufficient policy backing. To enhance the model's efficiency and sustainability, Guangdong Province needs to strengthen incentives, standardize services, and bolster policy support. These improvements can enable time banking to serve elderly care more effectively.

### *5.2 Discussion*

#### *5.2.1 In-Depth Analysis of Current Issues*

Empirical research and case analysis have identified several key issues with implementing the time banking model in Guangdong as an elderly care service model:

1. **Limited Awareness:** Public understanding of the time banking model is low, with many elderly individuals and potential volunteers unaware of how it works or how value is exchanged. Increased outreach and education are necessary to raise awareness and boost participation.
2. **Inefficient Operational Management:** A lack of a unified, efficient management platform means projects often operate independently, with insufficient information sharing and coordination. Establishing a centralized management platform would improve operational efficiency and service quality.
3. **Lack of Legal Protections:** The roles, responsibilities, and protections for participants are not clearly defined, which can impact volunteer motivation. Legal frameworks and protections should be established to secure the rights of both volunteers and service recipients.
4. **Challenges in Service Matching:** It is difficult to match service providers with recipients accurately, leading to surpluses or shortages in service provision. Improved service matching techniques and strategies are required to enhance accuracy and efficiency.

5. Sustainable Development: The model currently relies on government subsidies and social donations, with limited long-term funding sources. Developing effective incentive mechanisms and sustainable funding strategies will help attract more volunteers and maintain service provision.

### *5.2.2 Recommendations for Improving Time Banking in Elderly Care in Guangdong Province*

To foster the time banking model's growth in Guangdong Province, the following recommendations are essential:

1. Policy Support: The government should enhance its support by establishing the legal status and operational framework of time banks through legislation, ensuring their lawful operation.
2. Incentive Mechanisms: Implementing rewards, such as certificates of recognition and volunteer subsidies, can attract greater community participation.
3. Professionalizing Volunteers: Increasing training and assessments for volunteers will improve service quality. Establishing service standards and an evaluation system will further enhance professionalism.
4. Technological Innovation: Promoting technological solutions, such as online platforms or mobile applications, can improve service efficiency and accessibility.

These measures will help address current challenges and support the continued development of the time banking model.

## *5.3 Research Outlook*

### *5.3.1 Secondary Markets and Service Innovation Paths*

To support the future development of time banking in Guangdong, this study suggests focusing on secondary markets and service innovation. The secondary market includes potential non-mainstream groups whose needs, if addressed, can lead to more personalized services and expanded market coverage. Guangdong's time banks can leverage local social and cultural advantages to reach groups such as individuals with disabilities and people living alone, thus injecting new vitality into the model. In terms of technological innovation, introducing intelligent scheduling systems and blockchain technology can enhance service transparency and efficiency. To maintain quality, professional teams of volunteers should be developed. Policy innovation is also crucial, with local governments encouraged to provide incentives, such as tax breaks and time credits, to attract participants. By 2022, Guangdong's population aged 65 and over had reached 10.8 million, indicating significant growth potential for elderly care services. The time bank initiative has mobilized over 50,000 volunteers and operates in over 200 towns, showcasing its expansion capacity and service innovation pathway. Future efforts should focus on exploring secondary markets and service innovation to meet diverse needs and further develop the model.

### *5.3.2 Future Research Directions*

Future research on time banking as an elderly care model should explore the following areas:

1. Evaluation System Development: There is currently no unified standard to measure the social and economic benefits of time banks. Future studies should establish a scientific evaluation system to empirically compare the effects of time banking and traditional elderly care on quality of life, social integration, and economic cost.
2. Technological Integration: Combining big data and artificial intelligence can enhance the accuracy and efficiency of time banking services. Future research should focus on developing intelligent time banking to streamline service processes and improve user experience.
3. Time Currency Stability: Research on the stability and liquidity of time currency is limited. Effective monetary systems need to be designed to ensure time currency stability and encourage participation.
4. Cross-Regional Collaboration: With increased population mobility, demand for cross-regional elderly care is rising. Future studies should investigate mechanisms for interregional time bank cooperation to facilitate resource sharing.
5. Service Diversification: Given the diversity of the elderly population, time banking services should be tailored to different demographic needs. Research should address specific group needs and develop customized services accordingly.

These directions will provide valuable insights for advancing time banking theory and practice in elderly care.

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