Enhancing Statistical Infrastructure to Improve Economic Census Efficiency

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Abstract: With the continuous development of the economy and societal progress, the economic census, as an important aspect of national statistical work, is directly influenced by the quality of grassroots infrastructure. This paper thoroughly discusses the importance of strengthening the statistical foundation to improve the efficiency of economic census work, analyzes the existing issues in current infrastructure and census processes, and proposes corresponding solutions. By enhancing the professional training of grassroots statisticians, updating data collection technologies, and optimizing workflows, the aim is to significantly improve the accuracy and efficiency of the economic census, providing strong support for the healthy development of the national economy and informed decision-making.

Keywords: Statistics; Grassroots construction; Economic census

1. Introduction

In today's rapidly evolving economic environment, the economic census plays a crucial role. It serves not only as an essential foundation for the government to assess the national economic situation and formulate economic policies but also as a key reference for businesses to understand market dynamics and adjust their strategies accordingly. However, to ensure accurate and comprehensive economic data, efforts must begin with the foundation of statistical work [1]. Grassroots construction is the cornerstone of economic census activities, and its quality is directly linked to the accuracy of the census data and the overall efficiency of the process. Thus, exploring strategies to enhance the efficiency of economic census work through the improvement of statistical infrastructure is of both significant theoretical value and urgent practical relevance.

2. The importance of grassroots construction in improving the efficiency of the economic census

Grassroots statistical institutions are at the forefront of economic census data collection and processing.

The basic foundation of statistics directly affects the quality and control of data collection. A well-organized structure ensures the smooth progress of the census, helping to avoid data omissions and errors. The establishment of grassroots statistical institutions should take into account the actual local economic situation to more accurately describe and analyze economic activities [2]. Another crucial aspect of grassroots construction is improving personnel quality. The professional skills and expertise of statisticians directly impact the quality of census work. By offering regular training and assessments, statisticians can enhance their data collection, processing, and analysis abilities, thus improving the accuracy of the economic census. Statistical institutions should prioritize the selection and training of grassroots statisticians to ensure they possess the necessary statistical knowledge and skills [3].

3. Problems in grassroots construction and economic census

3.1. Uneven professional quality of grassroots staff

Grassroots statisticians are required to possess solid theoretical knowledge of statistics and rich practical experience when conducting an economic census. However, there are often disparities in the professional quality of grassroots personnel, which affects the accuracy and reliability of census data. Some statisticians may lack a deep understanding of statistical methods and data processing techniques, leading to errors during data collection, input, and analysis. This lack of professionalism not only diminishes data quality but also complicates subsequent data processing and analysis [4]. Additionally, professional training and knowledge updates at the grassroots level are inadequate. Some statisticians may not receive sufficient training opportunities throughout their careers or fail to keep up with the latest statistical techniques and methods. In such cases, they may lack problem-solving skills and strategies for handling emerging statistical problems or data processing challenges [5].

3.2. Data collection technology needs improvement

In the economic census, outdated data collection technology remains an issue in some regions or grassroots institutions. However, statistical departments have gradually adopted modern technologies to improve the efficiency and accuracy of data collection. The traditional reliance on paper questionnaires and manual records has posed significant challenges, especially when handling large volumes of data, as this method can easily lead to omissions or errors. With advancements in science and technology, tools such as PAD handheld terminal devices have been introduced into the economic census, significantly enhancing census efficiency. These handheld devices allow census takers to collect and upload data in real time, reducing information loss and entry errors while ensuring data integrity and accuracy through automated audit mechanisms.

Nevertheless, gaps remain in the adoption and application of data acquisition technologies in some grassroots statistical institutions, particularly concerning equipment upgrades and technical training. If statisticians do not fully understand these new technologies, or if technical equipment is not widely available, they may continue to face inefficiencies and compromised data quality. To address these challenges, it is essential to continuously promote and implement modern data acquisition technologies and provide relevant personnel with adequate training. This approach ensures that new technologies are fully utilized in census work, thereby improving the efficiency and accuracy of the economic census [6].

3.3. Insufficient public participation

Public understanding and attitude toward the economic census significantly influence participation rates. Some individuals may not fully grasp the purpose or importance of the census, leading to resistance and low cooperation [7]. Additionally, concerns about privacy and data security can deter participation. If these concerns are not properly addressed, the public may refrain from engaging in the census due to fears over data protection. In practice, insufficient public participation manifests as low response rates and incomplete information. Low response rates mean that only a small fraction of respondents provide valid data, which can skew the representation of economic activities. Incomplete information can lead to biased depictions of certain sectors or groups, thereby compromising the accuracy and representativeness of the census data [8].

3.4. Incomplete supervision mechanism

If the supervision mechanism is not properly established during the economic census process, problems can arise at any stage, ultimately affecting the accuracy of the entire census. At the data processing stage, the absence of standardized review procedures may result in incorrect data being included in the final results. An imperfect supervision mechanism may lead to insufficient data verification, causing the released data to inaccurately reflect the true economic situation. Additionally, unclear responsibilities, confused operational processes, and lax auditing procedures are likely outcomes of inadequate supervision, further undermining the integrity of the census.

4. Strengthening the strategy of grassroots statistical construction to improve the efficiency of the economic census

4.1. Enhance professionalism and build an elite team

One of the key strategies to strengthen grassroots statistical construction and enhance the efficiency of the economic census is to improve professional literacy and build an elite team. This strategy consists of two important aspects: strengthening personnel training and introducing high-quality talent, aimed at optimizing the overall structure and capacity of the grassroots team [9]. Strengthening personnel training is fundamental to improving professional quality. Regularly organizing professional skills training ensures that grassroots statisticians stay updated on the latest statistical theories and technical methods, thereby improving their capabilities in data collection, processing, and analysis. The training content should cover modern statistical tools, data analysis technology, information security knowledge, and other relevant areas to meet the high-quality data needs of the economic census. Training can take various forms, including centralized training, online courses, and on-site guidance, to accommodate the diverse learning needs of different grassroots personnel. Regular training and assessment not only improve professional skills but also enhance personnel's sense of responsibility and confidence in their work, thereby boosting the overall efficiency of census operations. Introducing high-quality talent is another important measure for optimizing the structure of the grassroots team [10]. Such talent brings advanced statistical methods and techniques to grassroots statistical institutions and drives the optimization and innovation of work processes. The recruitment process should emphasize candidates' professional background, practical experience, and overall competence, selecting those capable of handling complex statistical tasks and demonstrating strong problem-solving abilities.

4.2. Application of innovative technologies to improve survey efficiency

The application of innovative technologies is significantly enhancing the efficiency of economic surveys,

particularly with the introduction of mobile applications (apps). Compared to traditional data collection methods that rely on paper questionnaires and manual input, mobile terminal technology offers the advantage of efficient data entry and real-time uploading of electronic questionnaires, greatly improving both the speed and accuracy of data collection. Using mobile devices for data collection allows information to be directly stored and immediately uploaded to a central database, thus avoiding problems such as data loss or incomplete forms associated with paper questionnaires, while also reducing errors from manual input. The seamless integration of data acquisition and processing not only shortens transmission times but also minimizes biases caused by human intervention. Mobile apps also include features such as data validation and error prompts, which automatically detect potential errors during entry and prompt users to correct them in real time. This functionality significantly enhances data entry accuracy and reduces the manual errors common in traditional methods [11]. Furthermore, the integration of geolocation functions improves data reliability. By recording geographic location information during collection, the transparency and integrity of the data collection process are ensured, thereby enhancing the reliability of census data. Additionally, statistical departments are utilizing big data technology to analyze historical economic data, market trends, and social development dynamics, providing more accurate support for decision-making. Big data technology not only processes vast amounts of information but also extracts valuable insights through intelligent analysis tools, offering a scientific basis for planning and implementing the economic census. This data-driven approach enables statistical agencies to better predict and respond to economic shifts, optimize census resource allocation, and further enhance the efficiency and accuracy of the overall census.

4.3. Strengthening publicity and enhancing public participation

To strengthen publicity and enhance public participation, a variety of activities will be carried out to promote the public's in-depth understanding and knowledge of the economic census. The importance and significance of the economic census will be widely disseminated through various media channels, such as television, radio, newspapers, and online social platforms [12]. In this process, attractive promotional materials will be designed, including vivid and engaging videos and graphics. Interaction with the public will occur through both online and offline Q&A sessions, lectures, and other formats to address their questions about the census and further deepen their understanding and support for the census work. At the same time, an incentive mechanism will be established to encourage active public participation more effectively. This mechanism will offer rewards, potentially in the form of material incentives or certificates of honor, to individuals or organizations that actively provide accurate information during the census process. It is hoped that this approach will not only express gratitude to participants but also encourage more people to cooperate with the census work and provide true and accurate data, thus ensuring the reliability and effectiveness of the census results.

4.4. Improving the supervision system to ensure census quality

To improve the supervision system and ensure the quality of the census, oversight will be strengthened at both internal and external levels. In terms of internal supervision, a comprehensive mechanism will be established that covers the entire census process, from data collection and collation to analysis, ensuring that every step is carried out in strict accordance with established standards and procedures [13]. A dedicated internal oversight team will be formed to closely monitor all aspects of the census process and promptly detect and correct any possible deviations or errors. Additionally, census personnel will be regularly trained and assessed to enhance

their professionalism and sense of responsibility, ensuring they can perform census tasks to a high standard.

Regarding external supervision, efforts will be made to actively expand external oversight channels and accept supervision from all sectors of society. To this end, an open and transparent information release mechanism will be established to regularly inform the public about the progress of the census, any problems encountered, and the solutions implemented, thus enhancing the transparency and credibility of the census work [14]. At the same time, industry experts, media representatives, and the public will be invited to participate in monitoring the census, with their feedback and suggestions used to continuously improve the process. Furthermore, a special external supervision and feedback channel will be established to encourage all sectors of society to provide valuable comments and suggestions regarding the census work, allowing for the timely identification of problems and necessary improvements.

4.5. Strengthening publicity guidance to create a census-friendly atmosphere

To strengthen publicity guidance and create a strong atmosphere for the census, a multi-channel publicity strategy will be adopted to reach a wider audience. Full use will be made of traditional media such as television, radio, and newspapers, as well as new media platforms such as social media and online forums, to form a comprehensive publicity network. By releasing census-related information, interpreting census policies, and sharing census stories through these channels, the public's understanding and support for census work can be effectively enhanced.

To increase public participation, attractive content and various forms of publicity will be designed. Additionally, online and offline interactive activities, such as knowledge contests and questionnaires, will be utilized to stimulate public interest and enthusiasm for the census [15]. These activities not only increase public participation but also help gather more public opinions and suggestions regarding the census work. In the publicity process, attention will be given to the accuracy and timeliness of information to ensure that the public can obtain the latest and most comprehensive census information. At the same time, efforts will be made to actively respond to public concerns and questions, enhancing communication and interaction with the public, and thereby establishing a strong relationship of trust.

4.6. Establishing a supervision system to ensure census quality

The establishment of a supervision system is the key link to ensuring the quality of the census, which involves two aspects: the construction of an internal supervision mechanism and the expansion of external supervision channels. Regarding the construction of the internal supervision mechanism, emphasis will be placed on the development of detailed supervision processes and norms to ensure that every step of the census work is effectively monitored. This includes clarifying the responsibilities and powers of supervisors, establishing mechanisms for regular inspection and evaluation, and creating rapid response mechanisms for problem identification and resolution. The census data will be checked one by one through a strict internal audit system to ensure its authenticity and accuracy. In addition, advanced technical means, such as data comparison and cross-verification, will be used to further improve the reliability of the data.

In expanding external supervision channels, efforts will be made to actively seek the participation and support of all sectors of society. Through open and transparent information release, the public will be informed of the progress and results of the census promptly, thereby enhancing public trust in the census work. At the same time, industry experts, media representatives, and the public will be invited to supervise and evaluate

the census work, and their comments and suggestions will be welcomed to identify problems and make timely improvements. Furthermore, a linkage mechanism will be established with relevant departments and institutions to jointly review and verify the census data, ensuring its authority and credibility.

5. Conclusion

In general, the basic construction of statistics is key to improving the efficiency of the economic census. By strengthening the professional quality of grassroots personnel, updating data collection technology, optimizing workflow, and rationally allocating resources, the accuracy and efficiency of the economic census can be effectively enhanced. This will not only help governments make more informed decisions but also provide valuable data support for businesses and society. In the future, with the continuous advancement of technology and innovation in statistical methods, there is reason to believe that the basic construction of statistics will become more refined, and the efficiency of the economic census will be further improved.

Disclosure statement

The author declares no conflict of interest.

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