

Letters and Visits System Optimization and Implementation

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Abstract

The letters and visits system plays a vital role in government work, serving as a crucial tool for supervising law enforcement and administrative conduct, ensuring public officials' integrity, and promoting governance by law. As Chinese citizens' political awareness grows, the volume of letters and visits has increased steadily. This paper reviews the current state of letters and visits information construction, identifies challenges and problems in system integration, presents integration ideas for existing systems, and proposes an innovative approach to letters and visits system integration. This research aims to provide valuable insights and guidance for other units undertaking similar system integration efforts.

Keywords

Letters and Visits, Informatization, System Integration

1. Introduction

The effective management of letters and visits requires efficient handling, storage, and inquiry processes, as well as statistical analysis, all of which can be enhanced through information technology. The escalating political consciousness among China's populace has led to a steady rise in the number of letters and visits, culminating in a significant accumulation of petition cases annually. The manual handling, archiving, and retrieval of these cases have become increasingly cumbersome. Furthermore, the vast datasets generated remain underutilized due to the lack of timely analysis, and manual data processing is prone to errors. To address the public's needs and fully leverage the functions of guidance, supervision, coordination, and suggestion, letters and visits management systems have been established in various regions. While these systems have yielded positive outcomes,

challenges persist in their application, necessitating further integration, optimization, and improvement to enhance government service efficiency and better support the needs of the people.

2. Current State of Letters and Visits Information Construction

2.1. Background

The current letters and visits systems can be categorized into three types. The first type is the provincial letters and visits system, established by the provincial Bureau of Letters and Calls (or the National Public Complaints and Proposals Bureau), which primarily processes centralized complaint and visit information from the provincial Complaint and Visits Bureau. The second type is the letters and visits management system established by various business fields, which mainly handles information received by individual letters and visits offices within trade companies. The third type is the letters and visits system established by city and regional departments, which primarily handles complaint and visit information managed by individual governance administrative departments at all levels.

2.2. Overview of the Current Research Situation

The letters and visits system is a unique governance model indigenous to our country, serving as a crucial channel for government-citizen communication. Presently, it plays a vital role in reflecting public opinion, expressing citizens' demands, and safeguarding citizens' rights and interests. Similarly, the proliferation of big data and artificial intelligence has revolutionized societal structures and operational paradigms, introducing new demands for national governance. Furthermore, the application of big data technologies for information collection facilitates the analysis, prediction, and resolution of information silos, thereby enhancing interdepartmental information sharing and supporting data-driven decision-making for optimized petitioning management.

3. Key Challenges in Integrating the Letters and Visits System

The integration of letters and visits systems faces a multifaceted challenge, encompassing inadequate expertise in deploying cutting-edge technologies, requiring situational adaptations. Additionally, system updates are dependent on the completion of ongoing task execution phases, given the system's interactive task engagement while having to encounter technological constraints stemming from information standards and open protocols as well as Fluctuating national policy frameworks.

3.1. System Fragmentation, Process Non-Unification, and Material Non-Standardization

After years of software development in the letters and visits system, each city has established its own management system. However, due to the lack of a

comprehensive system planning framework, most systems were developed independently, resulting in isolated maintenance and operation [1] within respective governance fields. Consequently, the application processes and document materials in the letter and visit systems vary significantly. For instance, some information systems prioritize managing the workflow of letters and visits, while others focus on digitizing files collected from various sources, followed by manual review and feedback [2]. Moreover, some systems process letters and visit cases using office automation operation systems, highlighting the need for standardization and integration.

3.2. Disparate Databases with Redundant and Overlapping Data Fields

The lack of database standards in the letters and visits industry has resulted in disparate databases across various regions [3]. For instance, some databases are organized by handling standards, while others are structured by letters, visits, and network mailboxes. Additionally, some databases are categorized by processing levels, such as national, provincial, and municipal levels, while others are linked to provincial databases through corresponding relationships. Furthermore, data fields are inconsistent, with basic information like name, telephone number, and address stored in one table and relevant fields like certificate type, number, and email in another. Similarly, fields like title, classification, content, purpose, and code are scattered across individual tables, including specific fields such as Is-overseas, Co-Applicant, etc. This fragmentation hinders data integration and efficient management.

3.3. Functional Imperfections and Low Intelligence in the System

In the early stages of developing some information systems, the design of data import and export functions on interfaces was inadequate, resulting in a significant amount of manual data entry, which overwhelmed officers with multiple tasks. Additionally, some letter and visit systems were developed years ago with outdated technology, processing printed files instead of digital ones, requiring manual identification of all contents, and leading to lower work efficiency. Furthermore, customized processes and forms were inflexible and difficult to modify or expand, failing to meet the growing demands of the work.

3.4. Inadequate Statistical Analysis Capabilities, Failing to Support Regulatory Decision-Making

The databases of multiple systems were independently designed and managed for historical reasons, resulting in fragmented storage across different locations. This fragmentation poses significant challenges for data fusion and sharing, with some data stored in provincial letters and visits systems, others in ministry-associated systems, and some outside of systems altogether, making comprehensive statistical analysis impossible. Moreover, traditional statistical tables are primarily filled

in by cities and counties, with only a few spreadsheets useful for inter-governmental purposes. The lack of effective management standards, such as unified regularization and systematization, hinders the full utilization of data value. Furthermore, the letters and visits system lacks a standardized statistical model, failing to provide intelligent linkage capabilities for whole-process supervision, complaint and visit behavior risk warning, and emergency response planning.

4. System Integration and Application Technology: Techniques Integration, Business Integration and Tools

There are several specific technologies that can be seamlessly used to integrate and create a cohesive and efficient system, such as the following: Knowledge Base, Big Data, Artificial Intelligence, as well as Data Fusion, Target Fusion, and Mode Fusion.

4.1. Technology Integration

- Knowledge Base

The knowledge base of letters and visits is a repository that stores interconnected elements, organized through statistical analysis, screening, classification, and aggregation. This information is stored in a computer-friendly format, enabling the analysis of key factors related to letters and visits. By applying data-driven principles, we can quantitatively analyze the correlation between letters and visits events, uncovering valuable insights and relationships within the data.

- Big Data

Big data technology offers substantial benefits in enhancing social risk analysis, early warning, and response capabilities [4]. By leveraging big data mining and analysis, potential risks can be effectively identified and exposed. The extensive accumulation of letters and visits data enables the presentation of risk characteristics in a data-driven and modeled manner. For instance, analyzing the volume of letters and visits activities, appeals, and areas in a specific region can provide early risk warnings for future letters and visits activities in that area, facilitating timely management decisions to prevent and address the underlying issues reflected. This proactive approach enables authorities to mitigate risks and resolve problems before they escalate.

- Artificial Intelligence

Artificial intelligence (AI) technology presents a new opportunity to enhance government services and drive digital transformation [5]. Various regions have explored integrating intelligent tools into application scenarios, such as speech recognition, intelligent question-answering, and online robots. In semantic analysis, morpheme-based model training has continuously improved recognition accuracy. Leveraging AI data thinking and database design technology [6] enables the acquisition and identification of letters and visits data, supporting digital strategies for informed regulatory decision-making. Moreover, AI can be utilized for automatic classification and response, enhancing interconnectivity with other

public service systems, facilitating resource sharing and complementary advantages, and providing more convenient and efficient letters and visits services for the public.

4.2. Business Integration

- Target Fusion

To achieve various management objectives, it's essential to not only manage the letters and visits process routine but also focus on the source management of the problems addressed [7]. The integration of business management functions prioritizes the supervision of the entire letters and visits clue process, encompassing multiple aspects:

- Multi-channel clue collection
- Clue task assignment
- Clue handling process
- Clue handling results
- Tracking and feedback on clue handling

Comprehensive integration, on the other hand, is reflected in the overall management of letters and visits content [8], including:

- Complainant management
- Complaint and visit appeal management
- Complaint and visit case management

This integrated approach ensures a more effective and efficient management system.

- Mode Fusion

The rapid advancement of information technology has significantly enhanced network conditions, giving rise to the innovative 'Internet + letters' model [9]. This new approach to online letters and visits has profoundly impacted the dissemination of network public opinion, offering a more diverse range of choices to address the issue of unobstructed letters and visits channels. Moreover, it enables the 'government voice' to be more effectively heard amidst multiple stakeholder voices, fostering a more inclusive and responsive online engagement platform.

4.3. Data Fusion

- Uniform Data Coding

By standardizing and unifying data coding, scattered data can be integrated, eliminating redundancy and inconsistency and extracting more valuable information [10]. This unified coding ensures data uniqueness, enabling a consistent mapping relationship between data elements. As a result, data can flow seamlessly across departments, levels, and regions, facilitating information sharing and significantly improving the efficiency of integrated applications.

- Simplified Expression

The diverse and dynamic nature of letters and visits data, combined with the intricacies of business logic, result in complex data design [11]. This complexity

can lead to high concurrency, system crashes, and difficulties in data application. To address these challenges, it is essential to simplify the data structure, enable online database upgrades, and ensure seamless adjustments, repairs, and updates. By doing so, we can provide secure, reliable, and scalable data services that meet the needs of letters and visits management, guaranteeing data availability and system stability.

4.4. Potential Risks and Mitigation Strategies

To ensure a comprehensive and credible proposal, several potential risks and developed mitigation strategies can be shown as follows:

1) Data Backup. Data backup processes may be susceptible to risks, including data loss during migration and potential issues arising from the re-entry of data in new standard formats, such as Data duplication, Conflicts, and Inconsistencies in formatting. Therefore, regular professional data backup is essential.

2) Implementation Delays. Delays in integration timelines are another potential risk that can impact project deadlines. Consequently, it is planned to develop a detailed project schedule with milestones and buffers, as well as identify and prioritize critical path activities. Besides, establishing a change management process for scope creep or unexpected issues may be available for further mitigation.

5. Implementation of System Integration

It can be seen that there are several implementation strategy solutions as follows.

5.1. Establishing a Standardized Letters and Visits Database

Database integration is the cornerstone of system integration, marking the initial step in this process [12]. To begin, a unified database standard must be established. Next, the original database can be extracted using a standardized template to create a set of standard data fields. Following this, any discrepancies are identified, and non-standard fields are classified, and refined through splitting, merging, and conversion. Then, based on the latest unified coding specifications, any missing fields in the original database are completed. Ultimately, a comprehensive standard database is formed, meeting the necessary business requirements and paving the way for seamless system integration.

5.2. Setting up a Unified Complaint Reporting System Process for the Whole Province

Process integration goes beyond simply combining individual system processes [13]. The core objective of integrating the letters and visits system is to unify the handling processes across provincial, city, and county levels. However, inconsistencies in organizational settings, review requirements, and responsibility implementation have resulted in significant differences in the complaint and visit handling processes across cities and counties. To address this, business departments must start by promoting a unified, standardized, and multi-level linked “Internet

+ government service” technology and service system, as required by the National Implementation Plan for the Integration and Sharing of Government Information Systems [14]. By integrating high-demand, high-frequency, and strongly correlated processes into a unified workflow, we can achieve unified business management and information system alignment.

5.3. Expanding and Optimizing System Functions

The information platform for letters and visits management provides a comprehensive and dynamic environment for processing information [15]. System operation efficiency is crucial and can be measured in three key aspects: data collection, circulation functionality, and intelligent management.

Data collection for complaint reporting involves six essential contents: complainant information, complaint facts, appeal purpose, time limits for acceptance and response, handling basis, and additional attributes like source channels and problem classification.

Manual data input is insufficient for future management needs, so automated data collection through system integration is necessary. For interfaces that cannot be integrated temporarily, standardized templates can improve data acquisition efficiency.

The circulation function must be flexible to accommodate various letters and visits management needs. Unlike the fixed process design of the original system, which only allows one-time transfer, the actual process requires multiple circulations for complex matters.

Intelligent management is critical for letters and visits work, which involves intricate social contradictions related to politics, economy, ethnicity, culture, values, and more. Therefore, the system must be capable of intelligent analysis and decision-making to support effective management.

5.4. Enhancing Comprehensive Statistical and Analytical Capabilities

Enhancing the comprehensive statistical analysis capabilities of letters and visits can be achieved through three key approaches [16].

Firstly, establishing data and statistical standards is crucial. By identifying the statistical requirements of letters and visits, we can determine the necessary elements, attributes, values, content, status, scope, sources, and calculation methods. This will enable the formulation of statistical data extraction standards, considering various data exchange formats and unified database standards.

Secondly, optimizing statistical analysis methods will resolve the issues of slow speed and inaccurate results. By transforming real-time queries into quantitative non-real-time queries, we can leverage the accumulation of letters and visits data to establish ranking conditions that inform regular analysis, trend prediction, and decision-making.

Thirdly, utilizing data analysis models, such as keyword analysis, predictive

analysis, and multi-source fusion analysis, in conjunction with big data analysis technology, will enable intelligent early warning and linkage management. This will facilitate rapid response and emergency response planning, ensuring effective management of letters and visits.

6. Conclusion

In summary, the goal is to integrate the department reporting system with the integrated reporting department and industry systems. By achieving technological integration, business integration, and data fusion, it has effectively addressed the issues of system fragmentation, process inefficiencies, and data redundancy in letters and visits management. Moreover, this integration will enable a deeper fusion of digital technology and reporting business, leading to breakthroughs in unified process standards, system integration, data sharing, and cross-business synergy. This success will serve as a model for other units to follow in their own system integration efforts, providing valuable construction experience.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Jiang, S.H. (2014) Online Letters and Visits: Motivation, Problems and Their Development Path. *E-Government Affairs*, No. 2, 79-86.
- [2] Yu, S., Jiang, K.Y. and Xu, Y.Q. (2018) The Research Theme and Deepening Direction of Network Letters and Visits. *E-Government Affairs*, No. 1, 47-57.
- [3] Zhou, Y.J. (2021) Research on the Construction of the Suzhou Network Letters and Visits Information Platform under the Background of "Internet + Government Service". Master's Thesis, Soochow University.
- [4] Wang, Q.Y. (2019) Research on the Research and Application Mechanism of Big Data of Letters and Visits-Focuses on Intelligent Social Governance and Risk Assessment. *Research on Letters and Visits and Social Contradictions*, No. 3, 98-109.
- [5] Peng, W.F. (2019) Research on Intelligent Auxiliary Systems for Z City Based on Big Data. Master's Thesis, Hebei University of Technology.
- [6] Nicodeme, C. (2020) Build Confidence and Acceptance of AI-Based Decision Support Systems—Explainable and Liable AI. 2020 13th *International Conference on Human System Interaction (HSI)*, Tokyo, 6-8 June 2020, 20-23. <https://doi.org/10.1109/HSI49210.2020.9142668>
- [7] Rashinkar, P. and Krushnasamy, V.S. (2017) An Overview of Data Fusion Techniques. 2017 *International Conference on Innovative Mechanisms for Industry Applications (ICIMIA)*, Bengaluru, 21-23 February 2017, 694-697. <https://doi.org/10.1109/ICIMIA.2017.7975553>
- [8] Chen, X.J. (2015) Design and Implementation of the Letters and Visits Management System in Panyu District, Guangzhou City Based on B/S Architecture. Master's Thesis, Jilin University.
- [9] Fu, J. and Liu, Z.Y. (2019) Online Letters and Visits in the Era of Big Data: Governance Mode and Optimization Path. *Ningxia Social Science*, No. 2, 48-53.

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- [10] Shen, Y., et al. (2019) Design and Implementation of Engineering Standard Database System Based on Data Mining. 2019 18th *International Symposium on Distributed Computing and Applications for Business Engineering and Science (DCABES)*, Wuhan, 8-10 November 2019, 124-127.
<https://doi.org/10.1109/DCABES48411.2019.00038>
- [11] Yu, S., Ren, Y. and Lu, G.M. (2022) Online Letters and Visiting, Mass Work, and Public Value Creation. *Journal of Jiangsu University of Administration*, No. 5, 105-112.
- [12] Li, G.G. (2023) Research on the System Construction and Implementation Path of Online Letters and Visits. Master's Thesis, Shanxi University.
- [13] Livshitz, I.I., Lontsikh, P.A., Kunakov, E.P., Semenov, V.V. and Kibirev, Y.V. (2019) Statistic Method for Life-Cycle Processes of Digital Enterprises within Integrated Management Systems. 2019 *International Conference "Quality Management, Transport and Information Security, Information Technologies" (IT&QM&IS)*, Sochi, 23-27 September 2019, 37-41.
<https://doi.org/10.1109/DCABES48411.2019.00038>
- [14] Zheng, Y.P., Liang, C.X., Lian, Y.L. and Cao, X.Q. (2021) Current Situation and Problems of Digital Transformation of Local Government Departments-Empirical Research Based on the City-Level Government Hotline. *E-Government Affairs*, No. 2, 38-51.
- [15] Zhou, J. (2011) Design and Implementation of an Information System for Letters and Visits Management. Master's Thesis, University of TC.
- [16] Sun, X.H. (2013) Design and Implementation of the Complaint Reporting Management System of the Shouguang Municipal Commission for Discipline Inspection. Master's Thesis, Shandong Normal University.