On the Importance of Operation and Maintenance of Party and Government Information Systems: Postprint

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Date: 2023-10-08T00:00:00+00:00

Abstract

[Objective] Against the backdrop of rapid informatization development, the operation and maintenance of information systems in party and government organs has become an important component of government affairs work. [Method] This article employs literature review and case analysis methods to explore the importance, current status, and existing problems of information system operation and maintenance in party and government organs. [Result] Corresponding countermeasures and suggestions are proposed for improving the level of information system operation and maintenance in party and government organs. Conclusion The article offers recommendations on establishing and improving information security management systems and operation and maintenance systems, strengthening the construction and training of operation and maintenance teams, and enhancing cooperation and exchanges with enterprises, aiming to provide references for improving the level of information system operation and maintenance in party and government organs.

Full Text

Preamble

ChinaXiv Collaborative Journal: On the Importance of Information System Operation and Maintenance in Party and Government Agencies

(Beihai Daily News Office, Beihai, Guangxi 536000)

Abstract

With information technology developing rapidly, operation and maintenance (O&M) of information systems in party and government agencies has become an

important component of government affairs work. This article employs literature review and case analysis methods to explore the importance, current status, and problems of information system O&M in party and government agencies. It proposes corresponding countermeasures and suggestions for improving O&M levels, including establishing and improving information security management systems and O&M systems, strengthening O&M team building and training, and enhancing cooperation and exchange with enterprises, aiming to provide references for improving the O&M level of party and government information systems.

Keywords: party and government agencies; information systems; operation and maintenance; information security; security management

CLC Number: G226
Document Code: A
Article ID: 1671-0134(2023)04-037-04
DOI: 10.19483/j.cnki.11-4653/n.2023.04.007

Citation Format: Fu Yigui. On the Importance of Information System Operation and Maintenance in Party and Government Agencies [J]. China Media Technology, 2023(04): 37-40.

Introduction

With the advent of the information age, information technology is increasingly applied in government affairs, and the informatization construction of party and government agencies has gradually become an important component of government work. Information system operation and maintenance (O&M) is an indispensable link in informatization construction, playing a vital role in ensuring the security, efficiency, and reliability of government information.[1] However, due to the complexity and particularity of party and government information systems, O&M work faces a series of challenges and problems. Therefore, studying the importance and current situation of O&M for party and government information systems, and proposing effective countermeasures and suggestions, holds important practical significance and value for improving the level of government work and advancing informatization construction.

This paper aims to propose countermeasures and suggestions for improving O&M levels based on an exploration of the importance, current status, and problems of information system O&M in party and government agencies. To achieve this objective, this paper employs literature review and case analysis methods to conduct in-depth research and analysis of relevant theories and practices. By reviewing existing literature and cases, it summarizes the importance, current status, and problems of O&M for party and government information systems, and explores countermeasures and suggestions for improvement. The research findings of this paper can provide references for O&M work in party and government agencies.

Characteristics of Party and Government Information System O&M

Party and government information system O&M is characterized by: (1) **Diversity and complexity**. Government information systems are diverse and complex, involving multiple departments and domains with extensive business scopes, making O&M work highly challenging. (2) **High reliability**. The security, stability, and efficiency of government information are important guarantees for government work and relate to the credibility of government departments; therefore, O&M of government information systems demands high reliability. (3) **Strict confidentiality**. Government information systems may involve sensitive information such as state secrets or personal privacy[2], thus requiring high levels of confidentiality.

Current Situation and Problems of Party and Government Information System O&M

Party and government information system O&M work faces numerous problems, concentrated in the following areas: (1) **Insufficient information security assurance**. Government information systems involve considerable sensitive or classified information, but existing information security assurance measures are inadequate, creating risks of information leakage. (2) **Inadequate O&M team building**. O&M of government information systems requires highly qualified personnel with specialized technical expertise[3], but current O&M team building is insufficient, lacking talent and training mechanisms. (3) **Low overall technical level**. O&M of government information systems requires mastery of advanced technologies and management methods, but the existing technical level is relatively low and outdated, already unable to meet system requirements. (4) **Non-standardized O&M processes**. O&M work for government information systems lacks unified management standards, leading to chaotic processes and low efficiency. (5) **Lack of cooperation and exchange with enterprises**. O&M of government information systems differs significantly from that of enterprise systems, with corresponding lack of cooperation and exchange.

The Importance of Information System O&M in Party and Government Agencies

2.1 Information Security Assurance

Information security assurance is one of the core objectives of party and government information system O&M. Government information systems mostly contain classified information, such as financial information, personnel information, and policy information, thus requiring strict security assurance measures.[4] If government information is leaked or illegally obtained, it will significantly impact government work, potentially triggering social instability factors, damaging government image and credibility, and infringing upon the legitimate rights and

interests of the public. Therefore, information security assurance is an important goal and responsibility of party and government information system O&M. The importance of information security assurance is mainly manifested in the following aspects: (1) **Maintaining national security and social stability**. Information in government systems involves state secrets and important interests; information security assurance is a basic requirement for maintaining national security and social stability. (2) **Ensuring normal government operations**. Government information systems are important tools and platforms for government work; if these systems are attacked or damaged, normal government operations will be seriously affected. (3) **Protecting citizen rights and interests**. Government information contains citizens' personal information and privacy data; ensuring information security can prevent citizen rights from being violated. (4) **Maintaining government image and credibility**. Information security assurance concerns not only national and social interests but also government image and credibility. Information leakage will negatively impact government image and reduce public trust.

2.2 Work Efficiency Improvement

Party and government information system O&M plays an important role in improving the efficiency of government affairs. Government work involves processing large amounts of information; without effective information system support and assurance, the efficiency of government affairs would be greatly reduced, affecting the quality and effectiveness of government work. The importance of improving government work efficiency is mainly manifested in the following aspects: (1) **Increasing information processing speed and avoiding major errors**. Government work requires processing vast amounts of information; manual processing would consume considerable time and manpower, and could lead to errors due to human factors. Information systems can significantly increase processing speed and improve both efficiency and accuracy. (2) **Optimizing government workflows**. Government information systems can optimize workflows and improve efficiency. These systems help government agencies complete work planning, task allocation, information transmission, and other processes, thereby accelerating work progress. (3) **Improving government work quality**. Government information systems can enhance the quality and effectiveness of government work. With system support, government agencies can better grasp government information, make more scientific and reasonable decisions, and thus improve work quality and effectiveness. (4) **Enhancing government agency competitiveness**. The construction and O&M of government information systems can improve agency competitiveness. The higher the informatization level of a government agency, the more efficiently it can handle affairs and meet public needs, thereby increasing its competitiveness.

2.3 Information Reliability Assurance

The reliability of government information is the foundation for ensuring normal government operations. The importance of government information reliability assurance is mainly manifested in the following aspects: (1) **Ensuring the integrity and accuracy of government information**. Government agencies need to process large amounts of government information; missing or erroneous information will seriously impact government work and may even cause agencies to lose credibility. (2) **Improving accessibility of government information**. Government information systems must ensure information accessibility, so that even when systems fail or local networks are interrupted, published information remains accessible, enabling agencies to obtain information promptly and make more informed decisions. (3) **Protecting the security of government information**. Preventing government information from being tampered with, leaked, or destroyed. (4) **Improving the stability of government work**. Government information systems need to ensure information reliability, thereby enhancing the stability of government operations.

2.4 Information Sharing Promotion

With the arrival of the digital era, sharing of government information has become an inevitable trend, with many localities already building relevant government cloud sharing resources, such as government cloud resources. Government information sharing enables optimized utilization of information resources between governments and between government and society, providing more convenient and efficient services for government affairs. The importance of government information sharing is mainly manifested in the following aspects: (1) **Improving government work efficiency**. Information sharing can eliminate the "information silo" phenomenon between government agencies, avoid duplicate entry of information, and save agencies time and effort. (2) **Optimizing allocation of government resources**. Sharing avoids redundant resource construction between agencies and improves resource allocation efficiency, thereby increasing utilization and achieving optimal allocation. (3) **Improving quality of government services**. Agencies sharing their service information can provide more convenient, efficient, and precise services. (4) **Strengthening connections between government and society**. Sharing information resources between agencies promotes interaction and connection between government and society, enhancing government credibility and public trust.

Countermeasures and Suggestions for Improving Party and Government Information System O&M Levels

3.1 Establishing a Sound Information Security Management System

Information security is an important aspect of party and government information system O&M. Information security issues involve protection of government information, prevention of classified information leakage, and defense against

network attacks, all of which significantly impact both government affairs and national security. Therefore, establishing a sound information security management system is an important countermeasure and suggestion for improving O&M levels.[5] Specifically, establishing such a system requires: (1) **Improving information security management systems**. This includes formulating information security policies, regulations, and clarifying responsibilities to ensure institutionalized and standardized management. (2) **Strengthening information security awareness education**. Conducting security education to enhance staff awareness, including password security, avoiding online fraud, and preventing virus attacks, to improve protection consciousness. (3) **Implementing security audits and assessments**. Conducting security audits and assessments of party and government information systems to identify and resolve vulnerabilities and hidden dangers, ensuring information security. (4) **Enhancing security monitoring and emergency response**. Establishing monitoring and emergency response mechanisms to achieve real-time system monitoring and rapid response to security incidents. (5) **Implementing technical safeguards**. Using technical means such as encryption, firewalls, and intrusion detection to strengthen protection of government information and improve system security.[6]

3.2 Strengthening O&M Team Building and Training

The O&M team is the key force in party and government information system O&M, and its professional level and quality directly affect system stability and reliability. Therefore, strengthening O&M team building and training is an important measure for improving O&M levels. Specifically, this requires: (1) **Improving recruitment and selection mechanisms for O&M personnel**. Establishing scientific recruitment standards and selection mechanisms that emphasize comprehensive qualities and skill levels ensures the selection of personnel with excellent professional competence and service awareness. (2) **Strengthening background checks for new hires**. Conducting background checks on candidates before hiring to avoid introducing risky personnel into the O&M team. After hiring, confidentiality agreements must be signed to regulate staff behavior. (3) **Enhancing training and learning for O&M personnel**. Conducting training, lectures, seminars, and other activities to improve technical skills and professional qualities, enhancing O&M capabilities and service quality. (4) **Conducting regular assessments and evaluations**. Identifying and addressing problems and deficiencies among O&M personnel to improve their performance and service quality. (5) **Establishing a good work environment and incentive mechanisms**. Encouraging proactive attitudes and innovative spirit to improve team cohesion and creativity.

3.3 Improving Information System O&M Technical Level

Improving information system O&M technical level is a key measure for enhancing O&M in party and government agencies. Specifically, this requires: (1)

Keeping abreast of latest technological developments. Researching how to apply new technologies to party and government information system O&M to improve efficiency and quality. (2) **Strengthening technical knowledge training**. Conducting relevant technical training through various means to address new technologies and needs, improving personnel technical skills. (3) **Establishing technical exchange and sharing platforms**. Encouraging O&M personnel to share experiences and technologies to promote technical exchange and cooperation, including holding regular technical exchange meetings to share experiences and solutions and drive technological innovation. (4) **Adopting advanced management tools and methods**. Using technical means such as automated O&M, cloud computing, and big data to improve O&M efficiency and quality.

3.4 Strengthening Cooperation and Exchange with Enterprises

By strengthening cooperation and exchange with enterprises, party and government agencies can learn from advanced enterprise information security assurance and O&M management experience to improve government system O&M levels. Meanwhile, such cooperation also facilitates information sharing and resource integration, promotes in-depth government-enterprise cooperation, and provides strong support for building digital government and a digital society. Specifically, this requires: (1) **Establishing cooperation mechanisms**. Building cooperation mechanisms between government and enterprises to strengthen information sharing and improve cooperation efficiency. (2) **Establishing expert advisory teams**. Forming expert advisory teams and inviting enterprise experts in information security and O&M to provide technical support and consulting services for government system O&M. (3) **Strengthening technical exchange and cooperation**. Holding regular technical exchange meetings to share technical experiences and solutions and promote technological innovation and development.

3.5 Ensuring Network System Operation Stability

Ensuring network operation and security is an important component of information O&M, manifested in the following aspects: (1) **Information network system O&M**. This includes software O&M, security equipment O&M, and hardware O&M for servers, networks, and storage. To ensure stable system operation, it is necessary to strengthen defect repair in software design and development, resolve software usage and compatibility issues, enhance daily maintenance and system version upgrades, prohibit untested or unauthorized software from running on the network, and optimize hardware maintenance, daily storage, and fault handling workflows through comprehensive technical controls to ensure continuous operation and lay a solid foundation for system development.[7] (2) **Information network virus prevention**. Network viruses are malicious software with characteristics of self-replication, rapid propagation, and strong destructive power. Their invasion can cause system slowdowns,

crashes, data loss, and other problems that significantly impact normal system operation. Strengthening virus prevention can ensure normal system operation and prevent data loss and system crashes.[8] Virus prevention mainly includes: installing antivirus software and updating virus databases promptly, strengthening network security prevention, and enhancing user education to improve security awareness. (3) **Repairing information vulnerabilities**. To ensure safe network operation, it is necessary to strengthen vulnerability repairs in information systems, including bugs in protocols, software, hardware defects, and system security policies. To effectively resolve vulnerabilities, it is necessary to strengthen network vulnerability scanning and develop scientific and reasonable repair measures based on data analysis. Simultaneously, network control management measures must be strengthened, including comprehensive authentication and control of visitor identities, and regular updates of firewalls and antivirus software. Software or patches should be updated regularly to optimize and improve information systems and ensure normal operation.[9] (4) **Keeping pace with the times and upgrading systems promptly**. With technological development, hardware and software update iterations are very rapid, with new functions constantly emerging. It is necessary to update information system hardware and software promptly according to development pace, such as replacing high-performance servers, firewalls, web application firewalls, and software architectures, to ensure system stability and advancement as much as possible.

Establishing a Sound Information System O&M Process

4.1 Importance of O&M Process

In system O&M, the design and implementation of O&M processes are of great significance for ensuring normal system operation and stability. The importance of O&M processes is manifested in several aspects: (1) **Improving work efficiency**. Standardized O&M processes enable system administrators to work according to standardized procedures, reducing unnecessary repetitive work and error possibilities, thereby improving efficiency and shortening fault handling time. (2) **Ensuring system stability**. One of the main goals of system O&M is to ensure stability, and O&M processes are important means to achieve this. Standardized processes help identify and resolve system problems promptly, preventing minor issues from causing major failures and ensuring system stability and reliability. (3) **Reducing risks**. Standardized O&M processes can reduce risks that may arise during O&M. For example, establishing appropriate access control and privilege management can reduce the risk of hacker attacks; implementing proper backup and recovery strategies can restore data quickly when lost, reducing data loss risks. (4) **Improving response speed**. System failures are inevitable, but rapid response and resolution are crucial. Establishing standardized O&M processes enables system administrators to respond quickly to failures and handle problems promptly.

4.2 General Steps for Establishing O&M Process

Establishing and optimizing a sound O&M process should generally follow these steps: (1) **Understanding the current status and requirements of the information system**, including hardware, software, network environment, system architecture, applications, databases, and other aspects. (2) **Establishing an O&M management system**, including O&M service quality monitoring and evaluation, and continuous O&M improvement, to continuously enhance information system O&M levels. (3) **Formulating information system O&M management standards**, including Service Level Agreements (SLA), O&M processes, O&M standards, and O&M management systems, to ensure system reliability, security, and efficiency. (4) **Establishing an information system O&M team** to ensure personnel quality and skills meet O&M requirements. (5) **Improving and optimizing O&M processes**. Since processes have relative stability and variability, they require long-term operation and refinement to become mature. During process operation, unreasonable key points need to be adjusted, processes optimized, and O&M efficiency and quality improved to ensure stable and efficient system operation.

Case Study

To clearly track petition work volume, a municipal petition bureau established an information system in 2010 for recording and tracking citizens' petition information. However, due to the advanced age of its staff who remained in outdated work patterns, insufficient understanding of the role of information, lack of a dedicated O&M team, and issues with viruses and networks, the system was not fully utilized. To improve system utilization efficiency and O&M levels, the bureau adopted the following methods to enhance O&M, thereby improving both system utilization efficiency and overall work efficiency.

5.1 Establishing Standard O&M Process

Based on existing O&M processes and combined with the actual situation of the petition bureau, a set of standard O&M processes was formulated, clarifying responsibilities and standards for various tasks to ensure efficient and standardized O&M work.

5.2 Strengthening O&M Team Building

The petition bureau emphasized O&M team building and cultivation, strengthening personnel training and skill improvement through various methods, enhancing professional competence and technical levels to better adapt to the rapidly developing information environment.

5.3 Cooperating with Professional Enterprises

The petition bureau cooperated with a local professional antivirus company, thereby comprehensively resolving network viruses such as worms that had frequently troubled them, ensuring system security and stability.

Through the implementation of these methods, the O&M level of the municipal petition bureau's information system was significantly improved, and the system' s security, reliability, and stability were effectively guaranteed.

Conclusion

This paper explores the importance of party and government information system O&M and proposes countermeasures and suggestions for improvement. It first introduces the research background and significance, pointing out the important role of party and government information systems in the informatization of government affairs, while also noting existing security risks and O&M difficulties. Second, it analyzes the current situation and problems of O&M, including low technical levels, imperfect security management systems, and insufficient personnel training. Subsequently, it focuses on the importance of O&M, including its role and significance in government information security assurance, work efficiency improvement, information reliability assurance, information sharing promotion, network security and virus prevention, and establishment of O&M systems. Finally, it proposes countermeasures and suggestions for improving party and government information system O&M.

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Note: Figure translations are in progress. See original paper for figures.