Exploring Optimization of Interaction Design in Hierarchical Management System

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Abstract: Purpose:The paper provides new ideas and methods for the interaction design of hierarchical management system. Methods:Based on the perspectives of management and socio-action, this paper performs a deductive analysis of role relationships and information flow in current hierarchical organizational management from the perspectives of role relationship theory and information flow theory, combined with enterprise management system design experience.Results:From the perspective of management and socio-action, this paper analyzes the problems arising from the mapping of hierarchical organizational management in its management system and briefly discusses relevant solutions. Conclusion:Optimized methods for interaction design in hierarchical management system: The information in the management system can freely exchange up and down levels, as well as horizontally across departments, mapping potential management relationships into the enterprise management system to achieve better coordination mechanisms; increasing information classification and transmission labels, strengthening the subjective role of information senders, and more efficiently completing tasks; increasing information collaboration review mechanism, shortening the vertical level of information review, simplifying processes; intelligent simple manual operation interaction design.

Keywords: Hierarchical Organization; Interaction Optimization in Management System; User Role; Information Flow.

Introduction

Currently, various types of internet products have become an integral part of our lives and work due to the use of internet technology. For instance, there are software products for shopping, job hunting, renting apartments, and seeking various types of advice. As a result, there has been a growing interest in the research and theory development of various internet products. One of the most classic works is James Garrett's "The Elements of User Experience," which serves as the foundation for many design theories in various industries and internet products. However, in our management system, there are several core users who interact with each other, resulting in certain issues in information exchange. The author explores optimization solutions for interactive design in management systems from the perspectives of management science and sociology of action.

1.Current problems in hierarchical management system

The organization and management of a hierarchical system emerged in response to the large-scale industrialization of modern machines. It utilizes specialized division of labor, vertical command, file-based management, technical specialization, and strict regulations to effectively control organizational members and improve production efficiency. However, as the scale of the enterprise expands, excessive emphasis on rules and regulations in the organizational structure also produces significant negative effects. Liu Haijian states in his research on the Inert Characteristics of Enterprise Organizational Structure that the main reason for these negative effects is the traditional hierarchical management's lack of adaptability to the environment. For expanding enterprise management scales, it excessively emphasizes the reliability, explanatory, legitimacy, and replicability of the organizational structure, thus forming administrative inertia in enterprise management .

The author also found some issues with the hierarchical organizational structure in the management system designed by the company where he worked.

1)Due to the lack of free communication within the management system, managers often use different means, such as enterprise WeChat and cloud communication software within the company, to publish and transmit task information. Meanwhile, employees carry out tasks within the company's management system. This creates a time and spatial gap between task information and task execution, making it prone to confusion and omissions.

2) Unstable staff turnover due to unfamiliarity with the internal management mode and managerial intent increases the risk of task reversals and reduces work efficiency.

3) When multiple departments collaborate to complete a task, setting restrictions to reject and execute tasks mutually to safeguard their respective departments' interests easily leads to task stagnation. To address these issues arising from the hierarchical management system, the author attempts to seek solutions from the theories of role relationships and information flow.

2. Conceptual framework

2.1Role Relationship Theory

Role originally referred to the term used to address actors on stage. Later, sociologist Mead introduced this concept into the field of sociology to elaborate on the interpersonal relationships between people and other roles in specific social scenarios. Its main research contents include role cognition, role learning, and role expectations. Due to its close relevance to real life and excellent explanatory power, role theory has been widely applied in teaching activities and organizational management of enterprises, resulting in many classic theories.

For example, management scholar Henry Mintzberg proposed the role theory, which divided the work of managers into three categories and subdivided them into ten different job roles . Renowned psychologist Kahn proposed the overlapping role group model , believing that when an enterprise completes a task, it needs a "central figure" role and other collaborative working roles. In design practice, Feng Gaohua proposed basic principles and methods for interactive design of nursing system interface based on the study of nursing personnel's role relationships according to the system characteristics . It can be seen that role relationships have a significant impact on both management systems and working systems, and this is also the significance of the research on role theory.

2.2 Information Flow

Information flow was initially proposed by American communication scholar Rogers, referring to the process of information transmission using various means during the information communication process. Therefore, as soon as information is transmitted, an information flow occurs. Information flow is merely a concept, so research should be conducted on information flow events. Information flow events include the information source, the motivation behind the information source, the means of information transmission, the results (meaning) of information actions, and the information flow context . With the popularity of the internet, compared to traditional society's information events, information flow events under the internet have undergone significant changes. Under the internet, the information source has changed from physical individuals to machine instructions, the means of information transmission has changed from information transmission tools to computer information encoding, and the information context has changed from real-life scenarios to virtual internet environments. Therefore, we must pay special attention to the impact of changes in the information flow event subjects and information context under the internet, secondly, whether the encoded information can be clearly received.

3. Role relationships and information flow patterns in hierarchical management systems

3.1 Role architecture and authority in hierarchical management systems

The core of the hierarchical management system is to improve efficiency, which can help companies organize and manage production and operations efficiently. Therefore, it has two most obvious characteristics: first, specialized division of labor, that is, role classification in positions; second, authoritative hierarchical management. The organization's internal structure is one level above another, and all positions form a pyramid management structure to ensure that top-level decisions can be implemented smoothly and find the corresponding responsibility relationship. This management system can help companies improve work efficiency in the early stage of enterprise development. However, as the scale of enterprise development expands, standardization and formalization of the system are prone to causing enterprise inertia. The reasons for enterprise inertia have been mentioned earlier by Liu Haijian, but they are relatively broad. From the perspective of user roles, after the expansion of the enterprise, the scale of personnel, deeper hierarchical management, increased number of roles and more complex authority relationships require sharing and transmission of information across departments. Therefore, more communication means are needed for information transmission. Some departments aim to prove their work saturation rate, and they bombard information through multiple channels, making the recipients need to spend a lot of time dealing with messy information, thus reducing work efficiency. Xu Hong, Lin Zhong and Gao provide the following suggestions to address this issue: diversify the information structure of the hierarchical organization; flat management of the hierarchical organization; strengthen the incentive and punishment mechanism for internal management; cultivate common cultural concepts and value systems among internal management of the enterprise . These suggestions are beneficial to the reform of enterprise entity management, but from the perspective of enterprise management system, there is no discussion of how managers can manage efficiently or lack of strategies to implement specific measures using various means. Therefore, their reform proposals still need to be verified.

3.2 Information flow pattern in hierarchical management systems

The hierarchical management system in information exchange is unidirectional, with information being passed up and down the hierarchy. There is no flexible way of exchanging information, which leads to users losing time and productivity due to lack of timely communication during system operation. To address this issue, Akira Aoki classifies information processing and maps it into the management system, i.e., modularizing information management such as content management, user management, consultation management, and approval management. This modularized management approach has been widely adopted in many management systems, including educational and enterprise management systems. Although this approach distributes information exchange greatly by utilizing modular thinking, it still lacks immediate communication and hierarchical review issues have not been resolved.

4. Design strategy for management systems

4.1 Design ideas

Based on the above theoretical analysis and user role relationships, as well as information flow related theories, this provides some ideas for designing current bureaucratic management systems.

4.11.Diversify internal information communication methods and categorize information content modularly

Users can freely communicate with each other at different levels within the system through various means, such as real-time communication by searching for other personnel through the information architecture, checking review progress in a timely manner through document approval processes, and receiving task execution announcements. The design of functions and information categories can be based on the purpose of the system.

4.12.annotate the process of information transmission to clearly identify the main points and emphasize the role of the information

source.

In free timely communication, we all know who the communication objects are, so there is no lack of clarity regarding the information source. When there are multiple tasks in a task function bar, it is necessary to annotate messages, including specific operation procedures, file links, information importance, completion time, and responsible persons.

4.13.Increase information collaboration review mechanisms to shorten vertical review hierarchies and simplify processes.

In document approval processes, intermediate reviewers often lack knowledge of the actual situation of lower-level tasks, resulting in work errors or reduced efficiency. Therefore, a collaborative review method should be adopted. Collaborative review is similar to voting, where only after one has reviewed can they see the issues identified by others and submit an audit result back to the person initiating the review. This can reduce review time at multiple levels. Moreover, collaborative reviews improve the quality of audits.

4.14.Design intelligent and simple manual interaction interfaces for many task processes

Through system intelligence, tasks can be automatically marked as those assigned by the information source, and important tasks can be reminded. In the audit process, basic and routine errors can be automatically reviewed by the system to improve efficiency.

Summary

The hierarchical management model has been proven effective in improving enterprise efficiency through testing in business management. However, as the company grows, changes occur in both the internal and external environments, but these changes are not promptly addressed, leading to organizational inertia. This causes some potential role management relationships and information flow control subjects to fail to play their true roles, resulting in various issues. Through the deduction and research of the principles of hierarchical management system's role relationships and information flow, combined with personal design experience, we have obtained a design optimization strategy for hierarchical management systems and a user role-information module interaction model.

What we have explored regarding the problems in hierarchical management systems is only preliminary, and many important aspects have not been thoroughly covered, such as content load bearing capacity for information flow and information encoding issues. Moreover, in response to an increasingly intelligent society, where most information is processed by intelligence, user roles and information flow situations may be redefined.

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