Review and Outlook of Human Resources Informatization at Xinhua News Agency (Postprint)

Authors: Dong Yetong

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Abstract

This paper introduces the evolution of Xinhua News Agency' s organizational and personnel information system. The system has consistently adhered to an object-oriented, component-based design approach, successively implementing the digitization of personnel information, establishing an online collaborative processing platform for personnel operations, and preliminarily exploring the establishment of an enterprise information PaaS platform.

Full Text

Research, Outlook and Analysis: Review and Prospect of Xinhua News Agency' s Organizational Personnel Informatization

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Abstract

This paper introduces the development trajectory of Xinhua News Agency' s organizational personnel information system. Adhering to object-oriented and component-based design principles, the system has successively achieved electronic personnel information management, established an online collaborative platform for personnel business processing, and preliminarily explored the construction of a PAAS platform for enterprise informatization.

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Xinhua News Agency' s organizational personnel informatization has undergone three stages since 2004: the electronicization of personnel information, the online processing of selected personnel business, and the exploration of a sustainable development path. The system has evolved from personnel information management to personnel management informatization, and is currently advancing toward human resource management.

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1. Electronic Personnel Information Management

This initial stage employed a C/S architecture to address database flexibility and structured data management challenges. From a business perspective, "personnel information" encompasses work-related information generated during an individual' s employment at Xinhua News Agency, as well as partial archival information (primarily referring to the "three ages and two records" for cadres).

To accommodate evolving needs, the system implemented several key design innovations. First, it managed personnel business-related information through systematic administration. Specifically, database tables and fields were used to describe personnel information attributes (including general data attributes, personnel-specific attributes, and management attributes). This approach enabled adding, deleting, or modifying personnel information tables and fields through back-end administration without program modifications. Essentially, personnel business information was abstracted and encapsulated as objects within the program, which could then process any object conforming to this abstraction, thereby achieving a degree of on-demand flexibility [Figure 2: see original paper].

Second, the system preliminarily explored a component-based development model. This exploration was developer-led, guided by the principle that an industrial software product should be assembled through component registration. Components represented abstractions of similar functions, comprising properties, methods, and events, while modules served as concrete implementations of components. In this design phase, modules were categorized into four types: system modules, subsystem modules, functional items, and business processing modules. Each module type could be configured with entry parameters, corresponding programs, input conditions, personnel information settings, and related interface information. The personnel system was thus constructed from numerous modules of varying sizes, forming an external framework for the personnel client system similar to contemporary platform function registration [Figure 1: see original paper].

However, this design still reflected a technician' s perspective, merely classifying modules and consolidating functions for unified processing. Module registration involved both technical parameter configuration and personnel information settings, making the system accessible only to technical staff rather than business personnel. A significant drawback was that any business-level addition of

personnel categories or data management functions required technical support [Figure 3: see original paper].

This component-based approach was initially developed to solve practical problems. Since it could manage personnel, it could also manage finances and assets. After project completion, the designers encountered ARIS and SAP systems, discovering that their design approach—based on organization, resources, functions, and data—coincidentally aligned with this stage' s business component design [Figure 4: see original paper].

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2. Online Processing of Personnel Business

This second stage enriched personnel information and improved data accuracy. The system migrated from a complex client installation to a web-based platform, configuring nearly 100 business modules through two business components without programming. The personnel system thus evolved into a foundational platform for agency-wide personnel information.

However, limited funding necessitated compromises and restrictions in component design scope. Without comprehensive testing, later application extensions proved limited. The development process, entirely based on abstract logic, was difficult to comprehend and took over a year to complete. Subsequent maintenance by non-project-team programmers was nearly impossible, as understanding abstract logic and layered program design proved prohibitively difficult. Forced modifications over two years disrupted the original architecture, demonstrating that having unfamiliar programmers modify code was inadvisable; instead, comprehensive planning and unified redesign were necessary.

Additional features of this stage included an RBAC permission management model with module-level granularity and, technically, a data interface layer that shielded differences between underlying databases while achieving separation between business and presentation layers [Figure 5: see original paper].

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3. Exploring Sustainable Development

After years of effort, personnel flow business now operates through online collaboration. The personnel database maintains accurate and timely data, capable of providing real-time personnel change information to other systems. However, during application promotion, the system revealed weaknesses in stability and page interaction. Individual components inevitably have limitations and cannot satisfy all practical requirements.

Due to limited investment in the second-phase project, component development remained purely abstract and logical, requiring over a year for completion. Later maintenance by non-project personnel proved unfeasible. For programmers,

reading others' code is already challenging; comprehending abstract logic and layered designs is nearly impossible. Forced modifications over two years broke the original architecture. This experience proved that modifying programs by programmers unfamiliar with the system structure is ill-advised; instead, holistic planning and unified redesign are essential.

New System Design Principles

The new system should abstract general business models based on actual business and application patterns, refine typical components, and then drive platform software development through models. Under incomplete or unclear requirements, model-driven development should be adopted rather than requirement-driven development.

The new system first reconstructed the data model. While retaining the original system' s main-subset information structure, it designed a special table type—association tables—to clearly record relationships between organizations and individuals. It also designed subordinate tables to document references to relatively independent data objects (such as photos and articles) by business processes.

The new system also reconstructed the organizational model. Under a hierarchical organizational information structure, position nodes were established. Personnel are assigned to positions, which can be indexed independently.

Based on these data and organizational models, the new system abstracted business models to form business components, roughly categorized into organization management components, information management components, business processing components, and general components.

The system adopted the BPMN standard to design business process models, with business components participating as activities in business processes. It designed collaboration diagrams to drive system operation through metadata in a non-coding manner.

The new system employed a component + plugin + script architecture to progressively accommodate user requirements. Components carry business models as the system' s soul; plugins can integrate third-party extensions (technical extensions, presentation method extensions) to achieve better user experience; and personalized processing is enabled through script injection (SQL, JS, JSON, etc.) [Figure 6: see original paper].

As an exploratory initiative building upon the previous system' s model-based and component-based development, the new system expanded toward platformization with more generic component design, establishing a PAAS-type business application platform and attempting to create a more general enterprise information system ecosystem. Although it failed to replace the old system, this valuable attempt provided important lessons.

Currently, upgrading Xinhua News Agency' s personnel system is imperative.

System design should remain grounded in actual personnel business, provide convenient human-computer interaction modes, abstract highly general business models, refine typical components, and drive platform software development through models. It should inherit the old system' s data model, improve and optimize the organizational model, expand the functional model, and inherit and optimize information and process components.

The new system' s conception considers issues at the enterprise strategic level. Based on strategy, it establishes an organizational system with consistent rights, responsibilities, and benefits. It implements strategy through business flows among middle-level institutions and employs component-based system design thinking to establish systems with suitable components in each domain, thereby supporting information processing within middle-level institutions. The new system' s first step is to practice this approach in the human resources domain, which is closest to enterprise strategy. The new system should be called a platform.

References

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(Author Affiliation: Xinhua News Agency Technology Bureau)

The following content regarding power consumption (0.45A, 2.1kWh daily savings) appears to be from a different article and has been omitted as per translation guidelines.

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