

Practice on the construction of intelligent water affairs management system for coal mine water intake

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Objectives

In the daily production process of coal mines, a large amount of water consumption data will be recorded through the flowmeter on the pipe network. These data contain rich information. Although some information (such as instantaneous flow, table bottom value, etc.) can be directly visible to the naked eye, there is still a large amount of information hidden in the data that is difficult to be known by the management personnel, especially in case of over-quota, over-planned water consumption, abnormal water volume, and pipe network leakage, timely and accurate alarm is particularly important. At present, domestic research on intelligent water affairs system is mainly focused on urban water and river water regime and water quality monitoring, and there are few studies on the construction of intelligent water affairs system in coal mines. Therefore, in order to meet the requirements of the water administration department for the refined management of water resources, it is imperative to build the intelligent water affairs system for coal mine water intake by using intelligent sensing technology and combining with relevant calculation and analysis models.

System construction objectives

The intelligent water management system for coal mine water intake takes the "supply - use - consumption - drainage" process of coal mine water cycle as the monitoring object, and uses intelligent sensing technology to realize multi-level, high-frequency and whole-process integrated monitoring of the water supply end, water consumption end, drainage end and dissipation process of coal mine production water and domestic water units. Through data storage and processing, build a data analysis model to analyze and display water consumption data, and provide coal mines with automatic processing processes such as water consumption data acquisition, data integration, data calculation, data display, intelligent early warning notice, and unified management, so as to meet the requirements of national policies and regulations for coal mining enterprises in building a water-saving society, as well as the regulatory requirements of water conservancy government departments, and effectively strengthen the water intake and drainage management of enterprises, improve the water resource management level of enterprises, and finally achieve the goal of reducing the comprehensive cost of water management and improving the efficiency and efficiency of water management.

System application

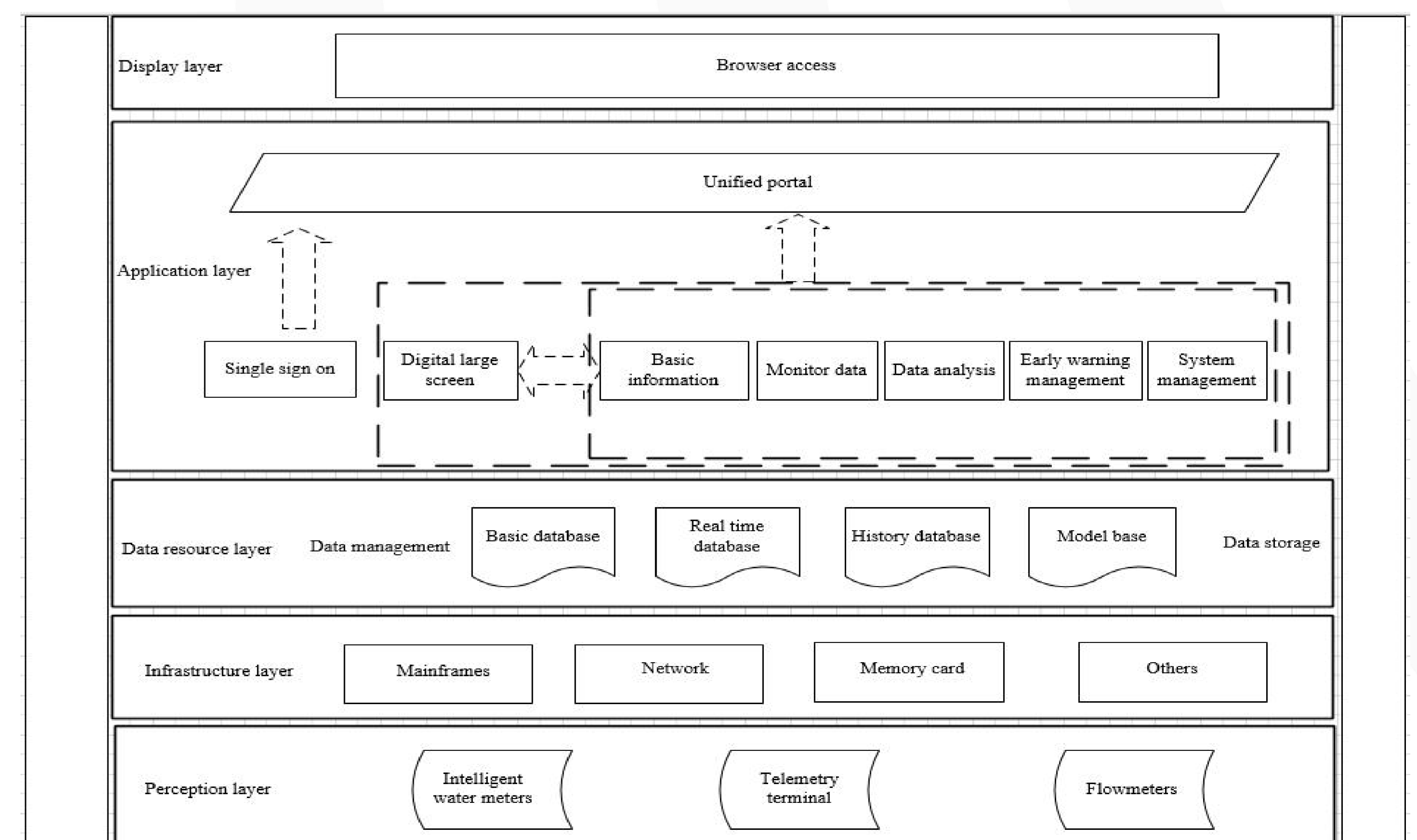
At present, the system has been successfully applied to a coal mine in Ordos City, Inner Mongolia. After the application of the system, the water consumption in the production of raw coal in the coal mine has decreased from 0.134m³/t to 0.096m³/t, reaching the first-level domestic advanced level of clean production, the water consumption of coal preparation production has decreased from 0.08m³/t to 0.06m³/t, and the per capita comprehensive domestic water consumption index has decreased from 264.3L (person·d) to 212.5L (person·d). In terms of water consumption: after the application of the system, the annual water intake of the coal mine has decreased from 1.1775 million m³ to 868700 m³, saving 308800 m³ of water annually, and the water saving rate has reached 26.23%, with obvious water saving effect.



System interfaces

Conclusions

The construction of the intelligent water management system in coal mines is a powerful way to implement the requirements of the Ministry of Water Resources on deep water saving and water control. The construction and promotion of the system can effectively promote the integration of information technology and mine water use management, achieve the refined management of the process of mine water use, significantly improve the level of mine water use supervision, and effectively implement the requirements of "use water resources with care, and strictly manage water resources with care", Significant economic and social benefits.



System architecture diagram