# Design of a data middle platform

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**Abstract.** As a systematic project integrating strategy, information technology, organization and management, ability and other factors, digital middle platform has become the mainstream of the development of today's era. Accelerate the application of 5g, AI and other technologies, further expand the application scenario of enterprise digital midrange, and enable enterprises to operate in a more intelligent way. While analyzing the demand of digital middle platform, this paper puts forward a digital middle platform structure based on the characteristics of digital middle platform, which can well face the needs of market and enterprises through perfect decision-making management.

**Keywords:** Digital middle platform, Decision management, Platform management.

## 1    Introduction

Data middle platform is a sustainable mechanism of "making enterprise data available", a strategic choice and organizational form. It is a mechanism to continuously turn data into assets and serve the business based on the unique business model and organizational structure of the enterprise and supported by tangible products and implementation methodology. The data middle needs to have four core capabilities: data aggregation and integration, data purification and processing, data service visualization and data value realization, so that enterprise employees, customers and partners can easily apply data.

Digital middle platform is a systematic project integrating many factors such as strategy, technology, organization, ability and mechanism. According to the corresponding objectives and functions of the middle platform, it can be divided into business middle platform, data middle platform, technology middle platform, organization middle platform, etc. In addition, some Internet companies represented by Tencent, byte beating and Baidu have also refined AI middle, security middle and recommended middle among these types of middle platforms in combination with their own businesses.

In 2018, the market scale of China's digital middle station reached 1.776 billion yuan, and it is expected to reach 12.557 billion yuan in 2022. AI media consulting analysts believe that the market scale growth trend of the digital middle platform

industry is obvious. With the layout of traditional software service providers and the entry of innovative enterprises, the digital transformation needs of all walks of life are released, and the whole digital middle platform market is expected to grow to 100 billion in the future.

## 2    Construction content

In order to realize the increasing demand for data analysis, the system builds a data center to realize the unified aggregation and storage of various types of data based on scene requirements, provides a unified analysis algorithm interaction environment, provides data analysis services in a unified way, practices the "storage, communication, governance and use" data asset system methodology, and has the functions of data quality analysis Functions such as data asset directory tree are used to display the overall structure of data assets.

The project scope of this project includes the construction contents of the following blocks：

### 2.1    Data asset management platform

The positioning of data asset management in the big data system is shown in the figure, which is located between the application and the underlying platform. Data asset management includes two important aspects: one is the core management function of data asset management, and the other is the safeguard measures to ensure the implementation of these management functions, including organizational structure and system. The structure of the management platform is shown in Fig. 1.
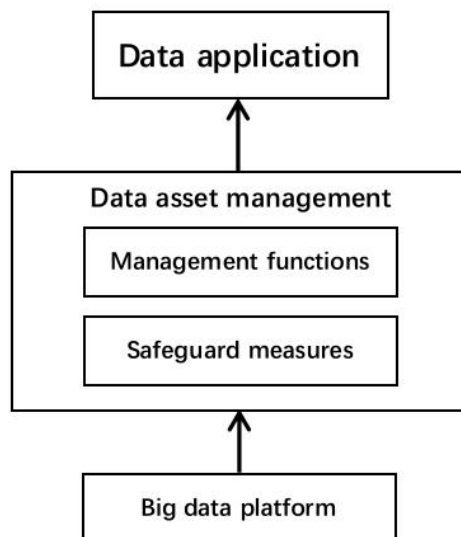
**Fig. 1.** The structure of the management platform.

Data asset management plays an important role in the big data application system. Support value creation oriented data application development at the top, and realize the management of the whole data life cycle by relying on the big data platform at the bottom.

Data asset management runs through the whole life cycle of data collection, application and value realization. Managing data assets is to improve the quality of data assets and promote the realization of data value in "internal value-added and external efficiency" through the management of data life cycle. Data is defined, created or acquired in a normative way, then stored, maintained and used, and finally destroyed. The life cycle of data begins before data acquisition. Data planning and data specifications are formulated in advance to obtain the technical capabilities required for data acquisition, delivery, storage and control.

## 2.2 Collection data range

The equipment configuration list is shown in Table 1.

**Table 1.** Collection data range.

| Business name | Business data scope | Proposed treatment method |
|---|---|---|
| Structured data | Mainly structured data, such as ERP database | Global data model |
| Unstructured data | Video data, audio data, image data, log data | Unstructured feature extraction |

## 2.3 Data service design and provision

After the development of scenario requirements specification and data, data services need to be formed and provided to users. This part mainly introduces the process of service design and provision, as shown in Fig. 2.
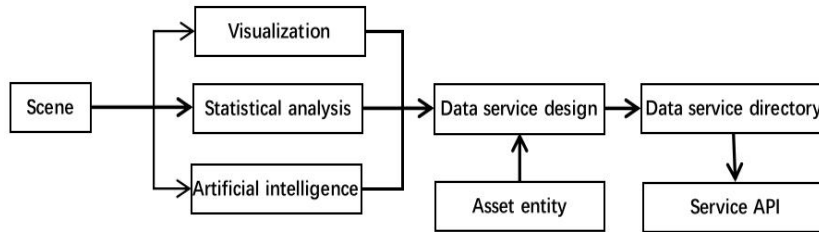
**Fig. 2.** The process of service design and provision.

## 3    Functional result

### 3.1    User center

Manage all users, roles and departments in the data center, and provide management capabilities such as registration, modification and cancellation of users, roles and departments.

**User management.**
- It supports the query of user list by user ID, user login name, user name, mobile phone number and user activation / deactivation status;
- It supports the function of adding new users. The new user information includes user login name, user name, mobile phone number and other basic information registration;
- It supports the modification and maintenance of user basic information;
- It supports the user's disable and enable functions. When the user is disabled, the user cannot log in to the system;
- It supports user logoff management. After a user logs off, all information is deleted;
- It supports binding and unbinding roles in user management;
- It supports specifying and adjusting the Department in user management

**Role management.**
- It is required to query and display roles by role ID, role name, role description and role activation / deactivation status;
- It is required to provide the function of adding roles. The new role information includes the registration of basic information such as role name and role description;
- It is required to support role basic information modification and maintenance;
- It is required to support the binding and unbinding of roles and users;
- The role enabling and disabling functions are required. After the role is disabled, the role management function is suspended until it is re enabled;

● The role deletion function is supported. After the role is deleted, all role management functions are deleted

**Department management.**

● It is required to query departments by department ID, department name, department description and department start / stop status, and display them in a tree structure;

● It is required to provide the function of adding a new department. The new department information includes the registration of basic information such as department name and department description;

● It is required to support the modification and maintenance of department basic information;

● It supports adding and adjusting users in departments;

● The enabling and disabling functions of the Department are required. After the Department is disabled, the department management function is suspended until it is re enabled;

● It supports the management of department logout. After department logout, all department management functions are deleted

## 3.2    Security management

The data center is required to support the three members separation management mechanism of system administrator, security guard and Security Auditor.

● It is required to support the system administrator user role mechanism for creating new users. Create a new role, which is no longer the highest authority user management of the system;

● It is required to support the security guard user role mechanism for user authorization, permission modification and permission viewing;

● It is required to support the role mechanism of Security Auditor and view various logs of the management system

## 3.3    Standard management

Support the formulation of unified metadata standards, reference data standards and indicator data standards, so as to achieve the goal of improving business standardization and business efficiency, reducing the communication cost of inconsistent data, promoting data sharing, improving data governance, and finally promoting data-driven management and accurate data analysis.

● It supports the formulation of metadata standard dictionary and provides the ability to create, modify, delete and maintain metadata standard attribute items;

● It supports the formulation of reference data standard dictionary and provides the ability to create, modify, delete and maintain reference data standard attribute items;

● It supports the formulation of indicator data standard dictionary and provides the ability to create, modify, delete and maintain indicator data standard attribute items;

● Data standards can be queried by data standard type and data standard name, and displayed in list

**3.4     Resource management**

The data center supports the resource management capability of data storage of structured data and unstructured data.

**Structured data storage resource management.**
● New structured Oracle data storage resources are supported. The new information includes storage resource name, resource description, host IP, port information, database name, access user name and password;
● New structured MySQL 、 MongoDB 、 HBase data storage resources are supported. The new information includes storage resource name, resource description, host IP, port information, database name, access user name and password;
● It supports the query of resources according to the resource name, resource type, connection status and resource enabling status of the structured database, and displays them in the form of charts, which can display the resource connection status and the space occupation of resources;
● You can select any database resource to deactivate, enable and delete

**Unstructured data storage resource management.**
● New unstructured FTP data storage resources are supported. The new information includes storage resource name, resource description, host IP, port information, access user name and password;
● New unstructured OSS data storage resources are supported. The new information includes storage resource name, resource description, connection address, storage space, access ID and access key;
● It supports the query of resources by unstructured resource name, resource type, connection status and resource enabling status, and displays them in the form of charts, which can display the resource connection status and the storage space occupation of resources;
● You can select any unstructured resource to deactivate, enable and delete

# 4     Conclusion

According to the portal design and management system in Section 3, this paper puts forward a function design of data middle platform.

# References

1. Giuliani, G., Peduzzi, P.: The PREVIEW Global Risk Data Platform: a geoportal to serve and share global data on risk to natural hazards. Natural Hazards and Earth System Science 11(1), 53-66 (2011).
2. Starks, A.M., Enrique, A., Cirillo, D.M., Denkinger, C.M., Dolinger, D.L., Claudia, E., Jim, G., Debra, H., Kim, P.S., Richard, L.: Collaborative Effort for a Centralized Worldwide Tuberculosis Relational Sequencing Data Platform. Clinical Infectious Diseases An Official Publication of the Infectious Diseases Society of America suppl_3, S141 (2015).
3. Hu, H., Wen, Y., Gao, Y., Chua, Tat-Seng, Li, X.: Toward an SDN-Enabled Big Data Platform for Social TV Analytics. IEEE Network 29(5), 43-49 (2015).
4. Sowe, S.K., Dong, M., Kimata, T., Zettsu, K.: Managing Heterogeneous Sensor Data on a Big Data Platform: IoT Services for Data-Intensive Science. IEEE International Computer Software & Applications Conference Workshops. IEEE (2014).
5. Nour, M.: A dynamic open access construction product data platform[J]. Automation in Construction 19(4), 407-418 (2010).
6. Woodard, J.: Big data and Ag-Analytics: An open source, open data platform for agricultural & environmental finance, insurance, and risk. Agricultural Finance Review (2000).
7. Li, J.L., Zhang, D.J., Zhao, Y., Zhang, Y.P.: Research and application of distributed data platform in the smart substation. Power System Protection and Control 42(24), 126-131 (2014).