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**Enterprise resource planning - Part 5: Reference architecture
for cloud services**

企业资源计划 第5部分：云服务参考体系

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6 General Requirements for Cloud Services

6.1 Technical Requirements Cloud services should meet, but are not limited to, the following technical requirements.

- a) Multi-tenancy support. Isolates data and configurations from different tenants, ensuring security and performance;
- b) Automated Operations and Maintenance. Provides a development and operations toolchain including monitoring, log analysis, and automatic repair;
- c) Performance optimization. Supports load balancing and caching mechanisms to handle high-concurrency scenarios;
- d) Cross-platform compatibility. Adapts to mainstream browsers and mobile devices, and supports responsive design;
- e) Intuitive UI/UX. Provides customizable dashboards, workflows, and low-code configuration tools;
- f) Customer service. Provides 24/7 technical support and has multilingual service capabilities;
- g) Transparent pricing. Supports pay-as-you-go pricing to avoid disputes.

6.2 Safety Requirements Cloud services should meet, but are not limited to, the following security requirements.

- a) Data security. Features include encrypted transmission, encrypted storage, and de-identification of sensitive data;
- b) Identity authentication and access control. RBAC-based permission management, supporting multi-factor authentication;

- c) Compliance Certification. Compliant with safety standards such as GB /Z 27001-2025;
- d) Threat protection. Defend against DDoS, SQL injection and other attacks, and conduct regular penetration testing.

7 Cloud Service Reference Architecture Layer Division

7.1 General Rules The cloud service reference architecture should be divided according to principles such as elasticity and high availability, security and compliance, and openness and integration, and may include infrastructure and technology. The platform, data middle platform, business middle platform, cloud service and other layers are shown in Figure 1.

7.2 Infrastructure

7.2.1 General Rules The infrastructure layer encapsulates the underlying computing, network, and storage resources to achieve a unified elastic operating environment for cloud services. One management component supports the automatic deployment, scaling, and management of managed applications, and should include micro-application management, service orchestration, elastic scaling, and security protection.

7.2.2 Micro-application management Micro-application management enables centralized governance of lightweight, independent small applications, featuring modular, independent operation, low coupling, and high efficiency. Features such as cohesion, agile iteration, and unified integration should include functions such as application registration, access control, resource scheduling, data isolation, and performance monitoring.

7.2.3 Service Orchestration Service orchestration enables dynamic service collaboration driven by business objectives, connecting disparate business services into a complete business process as needed. The technical system, characterized by visual configuration, loose coupling, real-time response, and cross-system integration, should include service registration and discovery, and a process engine. Features include driver implementation, exception handling mechanisms, execution monitoring, and dynamic adjustment.

7.2.4 Elastic Expansion Elastic scaling enables intelligent matching of resource supply and business load, featuring on-demand scaling, rapid response, cost optimization, and seamless switching. Features should include load monitoring, policy configuration, resource scheduling engine, and elastic billing.

7.2.5 Safety Protection Security protection can achieve multi-layered defense of physical environment, network architecture, data storage and access control, and has the characteristics of defense in depth and dynamic adaptation. With characteristics such as compliance and responsiveness, it should include functions such as physical security, network security, data security, access security, and application security.

7.3 Technology Platform

7.3.1 General Rules The technology platform supports the development, customization, operation, deployment, integration, and maintenance of enterprise resource planning (ERP) systems. It should include microservice governance, operations management, and basic... It includes basic services, development platform, and personalized customization functions, as shown in Figure 2.

7.3.2 Microservice Governance Microservice governance enables the independent packaging, deployment, upgrade, and scaling of microservices for cloud ERP businesses. It should include service registration, configuration center, and... Features such as link tracing.

a) **Service Registration.** Manages the registration and discovery of business microservices in the cloud ERP system, supporting microservice client-side load balancing or server-side load balancing. Load balancing.

b) **Configuration Center.** Performs full lifecycle management of program configuration information, enabling hierarchical, modular, and version-based management of configurations.

c) **Transaction tracing.** Real-time tracing and analysis of service call chains enables rapid identification of performance and fault issues in microservice clusters. diagnosis.

7.3.3 Operation and Maintenance Management Tools for system operation and maintenance management in a distributed cloud ERP deployment should include topology management, process updates, business monitoring, and data management. It has diagnostic and other functions.

7.3.4 Basic Services The basic services used to support the distributed cloud deployment of ERP should include message brokers, search engines, task scheduling, and distributed storage. Storage and other functions.

7.3.5 Development Platform Supporting the construction, assembly, operation, and expansion of ERP systems should include visual modeling, dynamic modeling, API services, and system development. Function.

7.3.6 Personalized Customization To enable the ERP system to respond quickly to customers' personalized needs, providing runtime and visual customization tailored to individual customer requirements. And operational support should include functions such as module customization, interface customization, process adaptation, and function expansion.

7.4 Data Platform

7.4.1 General Rules A data platform is an infrastructure centered on data to build intelligent

services, providing intelligent service support for enterprise resource planning. The integration should include functions such as data governance, intelligent models, conversational UI, and knowledge graphs, as shown in Figure 3.

7.4.2 Data Governance Data governance enables the modeling and management of ERP system data, and should include data transformation, data analysis, data assets, and data management. Function.

7.4.3 Intelligent Model Intelligent models provide a framework for creating artificial intelligence models and should include model design, model training, model export, and model deployment. Function.

7.4.4 Conversational UI Conversational UI integrates natural language processing and knowledge graph technologies to provide conversational interactive services for ERP systems, enhancing the user experience. The verification should include functions such as semantic understanding, dialogue management, intent recognition, and question-and-answer matching.

7.4.5 Knowledge Graph To provide knowledge support for intelligent application scenarios such as risk control and equipment maintenance in ERP systems, it should include knowledge modeling, knowledge extraction, and knowledge fusion. Features include knowledge reasoning and other functionalities.

7.5 Business Platform

7.5.1 General Rules The business middle platform establishes a unified processing engine for similar business processes, which can evolve into different modular functions according to different scenarios. The business middle platform provides... The granularity of data acquisition can depend on the technology and design of the application, and should include, but is not limited to, image centers, archive centers, payment centers, and process centers. Contract center, etc., as shown in Figure 4.

7.5.2 Imaging Center The image center can integrate various business documents and possesses the capability to process and analyze various images, including image printing, image analysis, and invoice processing. Functions such as verification and rule checking.

7.5.3 Archives Center The archives center can archive various historical business data, such as financial data, contract data, project data, and technological upgrade data. This should include... It has functions such as case registration, file retrieval, file borrowing, and file destruction.

7.5.4 Payment Center The payment center provides two types of services. domestic settlement and cross-border settlement. It is also interconnected with external banks to process various payment applications and receipts. Payment collection services should include payments for procurement, equipment, services, office supplies, sales, procurement