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Agent Networking Scenarios of Digital Banking
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Abstract

This document describes several typical digital banking scenarios, and discusses the trend of banking digitalization evolving to agentic service inteconnection. Then, this document proposes an agent networking architecture based on the core component which is agent gateway.

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1. Introduction

1.1. Background

With the rapid development of FinTech (Financial Technology), the digital banking business is undergoing profound changes. Traditional banking systems face performance bottlenecks and integration challenges when it comes to handling cumbersome corporate audits, high-frequency electronic transaction certificate, and deeply customized user experiences. The maturity of Artificial Intelligence (AI) technology, especially the emergence of the AI Agent, provides a new paradigm for solving these challenges. AI Agents, capable of autonomous decision-making and task execution, are becoming the core components for building the next generation of intelligent financial

services.

1.2. Agent Requirements in Digital Banking Scenarios

In the digital banking business, the application scenarios for AI Agents cover customer service, fraud detection, personalized investment recommendations, smart contract management, and complex compliance checks etc. These tasks often require the collaborative work of multiple Agents with different capabilities. For instance, a loan application may require one Agent for identity verification, a second Agent for credit scoring, and a third Agent for compliance review. This multi-Agent collaboration model necessitates a unified, efficient, and secure coordination mechanism.

1.3. Introduction of Agent Gateway and Networking Architecture

To achieve efficient, reliable, and secure networking and interaction among Agents, this proposal introduces the concept of the Agent Gateway and a networking architecture based on it. The Agent Gateway acts as a critical hub in the Agent ecosystem, responsible for:

* Agent Registration and Discovery: Allowing Agents to efficiently discover and invoke other Agents or external services.

* Efficient Agent Communication: Agents can delegate functions like message routing and group communication to the Gateway, allowing them to focus more on business-specific implementation.

* Security and Authentication: Providing a unified mechanism for authentication, authorization, and data encryption to ensure the security of financial data.

The networking architecture built upon the Agent Gateway is designed to provide an open, interoperable framework, enabling Agents developed by different vendors to be securely and seamlessly integrated into the digital banking business process. Furthermore, the gateway-based implementation method can greatly simplify an enterprise’s deployment and operations.

2. Terms and Definitions

* Digital Banking: refers to the end-to-end digitization of traditional banking services.

* Agent Gateway: a "Connection Hub" and "Security Steward" in the process of agent communication. Its core role is to resolve interconnection issues between different Agents of different domains while ensuring secure, efficient, and orderly communication.

2.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Modern Digitalization of Banking Services

3.1. Example Scenario 1: IPO Bank Statement Auditing

o Business Scenario:

During the process of a company’s Initial Public Offering (IPO), the Sponsor Institution (often an investment bank) is required to review the bank transaction records of the prospective listed company, its directors, supervisors, senior management (D&S&SM), and key personnel. This is done to understand related party transactions and fund transfers, and to verify:

* Whether the disclosure of related parties and related party transactions is complete.

* Whether there is any suspicion of fictitious revenue through off-book fund cycling.

* Whether there is undue benefit transfer or other undisclosed benefit arrangements.

o Traditional Offline Method:

The above process traditionally required the Sponsor Institution to accompany the relevant subjects being investigated to major local bank branches to print the bank statements (flow records) in person.

o Existing API Method (Digital Banking Approach):

Based on a Digital Banking Union Platform (i.e., China UionPay’ s Platform), the original offline process is transitioned online. With the full authorization of the subject, the Sponsor Institution sends a request to the bank via the digital platform. The bank then returns the transaction record information to the Sponsor Institution through the digital platform.

3.2. Example Scenario 2: Retail Credit

Leveraging the streamlined retail payment process flow as a foundational layer, the goal is to equip commercial banks with the capabilities to deliver standardized and highly accessible Inclusive Finance services to their retail customers.

This strategic integration transcends simple transactional banking, culminating in a powerful, synergistic model that forms a comprehensive "Finance + Payment + Service" ecosystem capability. This integrated approach ensures consistent user experience, significantly lowers the barrier to financial access for underserved populations, and establishes the bank as a pivotal digital financial hub.

3.3. Example Scenario 3: Bank Electronic Certificate Services

To significantly enhance the efficiency and transparency of the corporate client experience, we will deploy secure, automated services for the inquiry and compliant download of essential financial documents, including electronic receipts and electronic account statements.

This digital transformation is not merely an operational upgrade but a strategic move to solidify the value proposition of the Banking Union’s corporate business line, driving increased customer satisfaction, reducing operational friction, and accelerating the overall digitization of B2B financial services.

4. Bank Union and Digital Interconnection

4.1. Bank Union Organization

A Banking Union Organization typically refers to a non-profit joint organization collectively initiated and established by numerous member financial institutions. Its core objective is to build and operate a unified, efficient interbank transaction processing and clearing network. Taking China UnionPay as an example, it connects disparate bank card payment systems across different banks and regions by establishing and implementing uniform business rules and technical standards.

In essence, a Banking Union Organization acts as the "Public Infrastructure" and "Rule-Setter" in the payment domain. Through resource integration and collaboration, it constructs a vast, convenient, and secure financial payment ecosystem for its member institutions and the general public.

4.2. Digital Interconnection among Bank Union Members

All member banks adhere to the unified technical standards and data formats established by the alliance, seamlessly integrating their core systems with the alliance’s central clearing platform to achieve digital-level interconnection.

Taking the aforementioned case of IPO auditing as an example: when a company applies for listing, underwriters and lawyers need to conduct a thorough review of the company’s bank account transactions to verify the authenticity of its revenue and the compliance of its funds. If the company holds accounts in dozens of different banks across the country, this review process becomes extremely cumbersome. At this point, the digital interconnection system established by the banking alliance (such as China UnionPay) plays a critical role.

Although the company’s accounts are dispersed across various member banks, these banks have achieved unified data standards and system interoperability through UnionPay’s underlying financial network. Auditing institutions, with the company’s authorization, can access a standardized data interface and initiate query requests to the alliance network. These requests are instantly routed to the backend systems of each bank using a unified digital interface. Subsequently, the company’s transaction records, scattered across different member institutions, can be securely, accurately, and efficiently aggregated and returned.

4.3. AS-IS: API-based Service Calling

Traditional API calls demonstrate significant limitations when dealing with complex and ever-changing business environments.

* Firstly, there is the issue of Fragility and Rigidity. Traditional automation relies on hard-coded workflows and predefined logic. In the banking sector, even minor changes in business logic or underlying system behavior can disrupt automated processes, requiring manual reconfiguration. This fragility makes it difficult for systems to adapt to real-time changes.

* Secondly, there is a lack of active decision. Traditional APIs typically execute tasks only after receiving instructions, providing options or suggestions. Unlike Agents, which could autonomously interpret complex input signals, decide on the necessary sequence of actions across multiple systems.

* Finally, in traditional architectures, connecting multiple enterprise systems—such as CRM, ERP, and payment systems—often requires a complex, centrally defined orchestration layer managed by developers. This centralized control is prone to bottlenecks and limits flexible cross-functional collaboration.

4.4. TO-BE: Agentic Service Interconnection

Agentic interconnection/orchestration fundamentally overturns the traditional models mentioned above by introducing goal-centric, adaptive execution capabilities.

* Agents treat APIs as dynamic building blocks rather than fixed execution paths. Based on real-time context and shared memory, they flexibly select and invoke the most relevant APIs, enabling collaboration across various systems. This "context-aware decision-making" capability allows Agents to achieve more efficient cross-system integration than rigid, hard-coded scripts.

* Agentic workflows tackle complex problems using a multi-step, iterative approach. They are capable of dynamically adapting to real-time data and unexpected conditions, a feat that fixed-rule systems cannot easily achieve.

In short, Agentic AI represents the next phase of enterprise digital transformation. For digital banking, it is no longer optional but is the inevitable path to achieving operational excellence and strategic growth.

5. Proposed Agent Networking Architecture

5.1. Overview

In the banking industry, Agentic systems could categorized into two deployment models:

* Single-Agent Systems: In these systems, a single AI Agent processes all tasks sequentially. They are generally suitable for well-defined problems or processes requiring rapid resolution, such as dedicated fraud monitoring or automated report generation.

* Multi-Agent Systems (MAS): MAS involve multiple AI Agents collaborating to break down complex workflows into smaller parts. MAS are crucial for handling sophisticated banking workflows, such as credit underwriting, which involves both risk scoring and treasury management. MAS typically adopt a horizontal collaborative structure where each Agent focuses on a narrow skill (e.g., a Compliance Agent or a Risk Agent) and then integrates their respective analyses. This model offers higher scalability and flexibility but places greater demands on the mechanisms for inter-Agent communication, coordination, and state sharing.

The key challenge in realizing this vision lies in constructing an Agent networking architecture that supports decentralization, secure collaboration, and stateful communication.

5.2. Agent Gateway as a Key Enabler

As the banking industry advances toward agentic digitization, securely efficiently integrating AI agents into internal banking systems has become a critical challenge. In this context, the Agent Gateway could serve a core component for enabling this transformation. Its importance is primarily reflected in the following three aspects:

* First, the Agent Gateway serves as a communication hub for intelligent collaboration. It facilitates coordinated work among multiple AI agents by implementing unified communication protocols and context management, ensuring that different agents can execute complex business processes in an orderly and efficient manner.

* Second, the Agent Gateway acts as a foundation for security and compliance. Functioning as a centralized access control node, it authenticates identities, checks permissions, and audits operations for all AI agents, ensuring that every action complies with financial regulatory requirements and safeguarding system security from the source.

* Lastly, the Agent Gateway can also serve as a simplification/ adaptation layer for complex systems. It encapsulates the intricate APIs, data sources, and business systems within banks into standardized services, allowing AI agents to directly invoke required functions without needing to understand backend technical details, thereby significantly reducing the complexity of system integration.

6. Security Considerations

TBD

7. IANA Considerations

This document has no IANA requirements.

8. Acknowledgements

TBD

9. Normative References

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