1.0 Introduction

OMG Responses to Federal Reserve Discussion Paper

A brief introduction into the problem space, The Federal Reserve and the **White Paper** and the Object Management Group.

About the Federal Reserve White Paper

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Overview

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The U.S. Federal Reserve (The Fed) published a

White Paper

on Money, and Payments: The U.S. Dollar in the Age of Digital Transformation[1], which provided a discussion and analysis of cbdc.

Executive Summary

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> *For a nation's economy to function effectively, its citizens must have confidence in its money and payment services. The Federal Reserve, as the nation's central bank, works to maintain the public's confidence by fostering monetary stability, financial stability, and a safe and efficient payment system.*[2]
>
> *This paper is the first step in a public discussion between the Federal Reserve and stakeholders about central bank digital currencies (CBDCs). For the purpose of this paper, a CBDC is defined as a digital liability of a central bank that is widely available to the general public. In this respect, it is analogous to a digital form of paper money. The paper has been designed to foster a broad and transparent public dialogue about CBDCs in general, and about the potential benefits and risks of a U.S. CBDC. The paper is not intended to advance any specific policy outcome, nor is it intended to signal that the Federal Reserve will make any imminent decisions about the appropriateness of issuing a U.S. CBDC.*[3]

Background

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Payment technologies offered by the Federal Reserve have evolved over time. In the Federal Reserve's early years, it established a national check-clearing system and used dedicated telegraph wires to transfer funds between banks. In the 1970s, the Federal Reserve developed an automated clearinghouse (ACH) system that offered an electronic alternative to paper checks. And in 2019, the Federal Reserve committed to building the FedNowSM Service, which will provide real-time, around-the-clock interbank payments, every day of the year.[4)]

Recent technological advances have ushered in a wave of new private-sector financial products and services, including digital wallets, mobile payment apps, and new digital assets such as cryptocurrencies and Stablecoins. These technological advances have also led central banks around the globe to explore the potential benefits and risks of issuing a CBDC. Federal Reserve policymakers and staff have studied CBDC closely for several years, guided by an understanding that any U.S. CBDC should, among other things[5)]

- *provide benefits to households, businesses, and the overall economy that exceed any costs and risks;*
- *yield such benefits more effectively than alternative methods;*
- *complement, rather than replace, current forms of money and methods for providing financial services;*
- *protect consumer privacy;*
- *protect against criminal activity; and*
- *have broad support from key stakeholders.*

The Federal Reserve is committed to soliciting and reviewing a wide range of views as it continues to study whether a U.S. CBDC would be appropriate. Irrespective of any ultimate conclusion, Federal Reserve staff will continue to play an active role in developing international standards for CBDCs.[6)]

Key Topics

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This paper begins with a discussion of existing forms of money; the current state of the U.S. payment system and its relative strengths and challenges; and the various digital assets that have emerged in recent years, including Stablecoins and other cryptocurrencies. The paper then turns to CBDC, focusing on its uses and functions; potential benefits and risks; and related policy considerations.[7)]

The Federal Reserve's initial analysis suggests that a potential U.S. CBDC, if one were created, would best serve the needs of the United States by being privacy-protected, intermediated, widely transferable, and identity-verified. As noted above, however, the paper is not intended to advance a specific policy outcome and takes no position on the ultimate desirability of a U.S. CBDC.[8)]

Public Outreach

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> *The Federal Reserve will seek input from a wide range of stakeholders that might use a CBDC or be affected by its introduction.* ***This paper concludes with a request for public comment, the first step in a broad consultation that will also include targeted outreach and public forums.***[9)]

About the Object Management Group (OMG)

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Overview

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The **Object Management Group® (OMG®)**, founded in 1989, is an international not-for-profit software consortium (aka Standards Developing Organization (SDO) or a Voluntary Standards Consensus Body (VSCB)) that sets standards in the many areas including distributed object computing. The OMG manages an open, vendor-neutral process that proposes technologies, and invites proposals, and feedback from any member company before coming to a consensus on a final adopted specification standard. Some standards the OMG has developed for specific domains such as CORBA®, SysML®, UML®, and IIOP®. OMG has a fast-track approval agreement with the International Standards Organization (ISO) and all OMG standards are written in ISO format.

In addition to the work OMG has done on industry-wide standards, OMG is very active in 26 vertical markets, including Business, Finance, Government, Healthcare, Manufacturing, Military, Robotics, Space, and Telecoms.

The following OMG standards have been identified as relevant to Distributed Systems by the DARPA funded Distributed Immutable Data Object - Reference Architecture (DIDO-RA):

- OMG: Automated Source Code CISQ Maintainability Measure (ASCMM)
- OMG: Automated Source Code CISQ Measures (ASCQM)
- OMG: Automated Source Code CISQ Performance Efficiency Measure (ASCPEM)
- OMG: Automated Source Code CISQ Reliability Measure (ASCRM)
- OMG: Automated Source Code CISQ Security Measure (ASCSM)
- OMG: Business Motivation Model (BMM)
- OMG: Business Process Model And Notation (BPMN)
- OMG: Case Management Model and Notation (CMMN)
- OMG: CISQ Automated Enhancement Points (AEP)
- OMG: CISQ Automated Function Points (AFP)
- OMG: CISQ Automated Technical Debt Measure (ATDM)

- OMG: Common Warehouse Metamodel (CWM)
- OMG: Data Distribution Service (DDS)
- OMG: DDS Consolidated XML Syntax (DDS-XML)
- OMG: DDS For Extremely Resource-Constrained Environments (DDS-XRCE)
- OMG: DDS Interoperability Wire Protocol (DDSI-RTPS)
- OMG: DDS Security (DDS-SECURITY)
- OMG: Distributed Ontology, Model, and Specification Language (DOL)
- OMG: Extensible and Dynamic Topic Types for DDS (DDS-XTypes)
- OMG: Financial Industry Business Ontology (FIBO)
- OMG: Financial Instrument Global Identifier (FIGI)
- OMG: Information Exchange Framework (IEF)
- OMG: Interface Definition Language (IDL)
- OMG: ISO/IEC C++ 2003 Language DDS PSM (DDS-PSM-Cxx)
- OMG: Java 5 Language PSM for DDS (DDS-Java)
- OMG: Meta Object Facility (MOF)
- OMG: Ontology Definition Metamodel (ODM)
- OMG: OPC-UA/DDS Gateway (DDS-OPCUA)
- OMG: RPC Over DDS (DDS-RPC)
- OMG: Semantics Of Business Vocabulary and Rules (SBVR)
- OMG: Structured Assurance Case Metamodel (SACM)
- OMG: Structured Metrics Metamodel (SMM)
- OMG: Systems Modeling Language (SysML)
- OMG: Test Information Interchange Format (TestIF)
- OMG: Unified Architecture Framework (UAF)
- OMG: Unified Modeling LanguageTitle (UML)
- OMG: Web-Enabled DDS (DDS-WEB)
- OMG: XML Metadata Interchange (XMI)

Public Response to Outreach Request

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The OMG has reached out to its members to solicit an overall OMG response to the White Paper. Two groups within the OMG are providing extensive information in response to The Fed's request for Public Outreach.

Table 1 provides a list of OMG groups that would have interest in the U.S. Based CBDC.

Table 1: OMG Groups having interests in U.S. CBDC.

Blockchain Platform Special Interest Group (PSIG)	The Blockchain PSIG is to work with OMG domain and platform task forces, other relevant OMG SIGs, external entities, and related industry groups to facilitate the submission and adoption of Distributed Ledger Technology (Blockchain) and related standards. **Mission:** In order to accomplish this mission, the Blockchain PSIG will: 1. Search out and assist specifications for submission to the OMG in the Distributed Ledger Technology space. 2. Foster cooperation between implementers and users of Distributed Ledger technologies 3. Clarify user requirements and coordinate the evolution of Distributed Ledger Technology specifications, influence related specifications, and catalyze new specifications. 4. Identify opportunities to leverage and integrate Distributed Ledger Technology with other computing standards (including other distributed computing standards) and help develop necessary collaboration/interoperation specifications. 5. Educate, guide, and assist the community in the use of Distributed Ledger technologies. 6. Promote and evangelize the use of Distributed Ledger technology OMG standards in the marketplace and seek additional opportunities for the technology. 7. Contribute to other OMG Task Forces with Blockchain and Distributed Ledger Technology insights and perspectives on their work. 8. Establish and maintain active liaison relationships with appropriate external organizations in support of the goals of this PSIG.
Government Domain Task Force (DTF)	The Government Domain Task Force was chartered in the OMG's Domain Technology Committee Plenary, on 17 February 2006 during the Technical Committee meetings in Tampa FL. **Mission:** 1. To serve as a Community of Interest in the application of Model Driven Architecture and other OMG specifications to governmental organizations in civilian, defense, and intelligence sectors. 2. Recommend technology specifications based on OMG's Model Driven Architecture (MDA) that enable interoperability, reusability, and modularity in government systems. 3. To provide advice, consultation, and support to the OMG in the development of specifications applicable to government systems in particular. 4. To form and coordinate government-specific working groups within the Task Force tailored to address the particular needs of specific governmental sectors at the international, national, regional, or local levels. 5. Liaise with external Standards and Governmental Organizations

Retail Domain Task Force (DTF)	The Retail Domain Task Force (RDTF) is a community dedicated to helping retailers and solution providers identify, adopt and integrate current and emerging information technology. The RDTF was originally founded in 1991 as a share group for retail CIOs and then incorporated in 1993 as the Association for Retail Technology Standards (ARTS). ARTS was subsequently acquired by the National Retail Federation (NRF) in 1998; the Object Management Group® (OMG®) and NRF entered into a long-term agreement to manage and develop the retail standards in 2017. **Mission** To increase the benefits and reduce the costs, risks, and timescales of using Information Technology within the retail sector by: 1. Developing and promoting standardized retail business models and practices that foster a shared understanding of retail business principles, terminology, and data between retailers and their suppliers. 2. Establishing technical standards, specifications, and best practices that enable communication of business data within retail enterprises, and between retail enterprises and their suppliers. 3. Creating standards for the integration of IT applications and devices into retail business systems. 4. Communicating the requirements of the retail industry to IT suppliers & users, both inside and outside OMG.

Summary

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The members of the Object Management Group (OMG) have produced a single response to the Federal Reserves White Paper " Money, and Payments: The U.S. Dollar in the Age of Digital Transformation"[10]. The White Paper was divided into two main sections: Discussion of a Central Bank Digital Currency (CBDC), and specific questions about the potential of a U.S. CBDC. The questions were further categorized into two main areas: CBDC Benefits, Risks, and Policy Considerations; and CBDC Design Considerations. The OMG response was written as a series of small sections using a WIKI and then printed as a PDF for submission back to the Federal Reserve. After the submission to the Federal Reserve, the contents of the WIKI are publicly available on the Internet. In order to relate the two sections, the OMG first analyzed the Discussion portion of the White Paper for "Desirements" (the white paper was not written as a requirements document, therefore the use of the term "Desirements"[11]). Each of the "Desirements" was classified as being a:

- Benefit Considerations,
- Policy Considerations,
- Risk Considerations,
- Design Considerations

Each Desirement was numbered, referenced to the original page number in the White Paper, and listed in appropriate tables as a quick reference. Finally, each of the 22 questions was answered using the "Desirements" as context back to the discussion portion of the White Paper. As the answers to the questions were formulated, some Common Elements were identified and made into independent

subsections for reuse in the formulation of the answers to multiple questions.

[1)] [2)] [3)] [4)] [5)] [6)] [7)] [8)] [9)] [10)]

Board of Governors, The Federal Reserve System, January 2022, Accessed: 5 May 2022, https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf

[11)]

Desirement is a blended word combining the word **Desire** and **Requirement**. **Desirement** is something that is desired, but not absolutely required and is often used to caption the capabilities of a product or system before it has reached the formal requirements phase. Source: Desirement

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