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開放銀行區塊鏈個資安控平台

談及大眾對個人、組織資產管理的需求，自存款、消費支付到投資理財、信用貸款，這些傳統銀行所能提供的服務和產品，相信對多數人來說並不陌生。然而，傳統銀行各間獨立運作，資料無法整合的特性，往往於辦理相關手續、填寫審核資料時無形增加客戶的時間成本。正因如此，開放銀行（Open banking）的概念於近年逐步興起，希望能藉由透過開放金融數據和服務接口，促進銀行、第三方金融機構和客戶之間的資訊交流和互動，提升客戶的服務體驗。

本院資訊科學與工程研究所的袁賢銘教授，與就讀博士班的廖家鴻同學，亦藉由對金融服務模式轉變趨勢的洞察，基於區塊鏈的身分管理和訪問控制（BIMAC）框架，開發出能強化金融服務資安，整合用戶金融資訊的「開放銀行區塊鏈個資安控平台」，報名參加 2022 未來科技獎並成功獲獎。該技術之最初發想源於開發團隊發現，過去幾年在新冠肺炎疫情肆虐下，各種數位應用受「減少實體接觸」的需求影響，如雨後春筍出現，開發團隊觀察到，這類應用往往需要建立數位身分方可使用；然而，個人數位身分增加的同時，除了個資分散難以管理、資料外洩導致身分遭竊風險提高等難題隨之浮現。

如同前段所述，近幾年傳統銀行業轉型開放銀行的浪潮盛行，將金融資訊的控制權交還給顧客已為趨勢，此一轉變使得顧客有權決定是否要讓第三方服務提供者（TSP）存取自身帳戶資訊。於此考量下，為了實現數位身分整合及去中心化資料存取控制，開發團隊嘗試將目前以財金公司為中心的生態系統去中心化，建立一個用於開放

銀行的區塊鏈個資安控平台，設計並實作去中心化應用程式（DApp）。在用戶同意的前提下，第三方服務提供者便可透過該平台整合用戶在多家銀行的資產、帳單等金融資訊，進而分析用戶數據，提供多元且新穎的服務，滿足用戶需求。

在 BIMAC 的框架下，該平台能夠實現開放銀行業務所需，包括用戶去中心化數位身分整合、私鑰一鍵登入第三方服務、線上開戶、符合歐盟 GDPR 標準之資料共享、繳費與支付交易授權和 TSP 訪問監控等六大功能。整體來說，這套框架不單可強化創新金融服務的資安、延伸現有的產品服務，還可提供開放銀行一個標準化共享服務的模式，促進市場上銀行及 TSP 的合作與創新，實現「聯盟鏈共同治理」、「用戶身分整合」、「資料安全共享」等目標，打造多元開放的銀行生態圈。

目前我國尚未融入可操作的三階段開放銀行業務，未來若順利進入允許用戶授權 TSP，向銀行發出交易申請的「交易面資訊」之開放銀行第三階段，BIMAC 框架將可滿足此階段中繳費、整合支付、線上簽署合同等需求。開發團隊藉由融合傳統銀行和區塊鏈技術之優勢，使「用戶實名註冊」但於「鏈上匿名」，進而實現隱私保護與數據共享；另一方面，在去中心化目標達成的同時，確保監管單位不致喪失監控能力。該技術已確認可支持金管會力推的「無接觸金融服務」及「手機身分識別 App」，未來將有機會做為各項整合性服務之關鍵架構，完善金融服務的數位生態系！

Blockchain-based Identity Management and Access Control (BIMAC) Framework for Open Banking Ecosystem

When we discuss the demand for asset management by individuals and organizations, it's common knowledge that traditional banks offer services such as self-service banking, consumer payments, investment management, and credit loans. However, traditional banks often operate independently, which can result in a lack of data integration in their workflows. This often leads to longer processing times for customers when dealing with relevant procedures and filling out information. To improve the customer experience, the concept of Open Banking has gradually emerged in recent years. It aims to facilitate information exchange and interaction among banks, third-party financial institutions, and customers by opening up financial data and service interfaces.

Professor Shyan-Ming Yuan and PhD student Chia-Hung Liao from the Department of Computer Science developed the "Blockchain-based Identity Management and Access Control (BIMAC) Framework for Open Banking Ecosystem" to enhance financial service security and integrate customer financial information. The platform, based on the BIMAC framework, won an award at the 2022 Future Tech Awards. The team initiated the development of this technology, as there has been a growing need to reduce physical contact during the COVID-19 pandemic. In recent years, diverse digital applications have emerged, which inevitably require the establishment of a digital identity. However, as the digital identities scatter in different service platforms, it has led to issues such as managing decentralized personal information and the increased risk of identity theft due to data breaches.

In recent years, there has been a prevalent trend of traditional banks transforming into open banks, as previously mentioned. This shift involves relinquishing control of financial information to customers, allowing them to decide whether to grant third-party service providers (TSPs) access to their account information. To achieve digital identity integration and decentralized data access control, the team endeavors to decentralize the current financial ecosystem that revolves around financial companies. They aim to create a blockchain-based platform for personal information security and control for open banks, along with designing and implementing decentralized applications (DApps). Upon receiving the customer's

consent, third-party service providers can utilize the platform to aggregate the customer's financial information, including assets and bills, from multiple banks. They can then conduct the data analysis to offer a wide range of innovative services that cater to the customer's needs.

The platform under the BIMAC framework is equipped with six essential capabilities for open banking, including decentralized integration of digital identities of customers, single-click access to third-party services through private keys, online account opening, data sharing that conforms to EU GDPR, authorization of payments and transactions, as well as monitoring of TSP access. Overall, this framework serves to enhance cybersecurity for cutting-edge financial services while expanding the current product offering. Additionally, it establishes a standardized model of sharing services for open banks and encourages collaboration and innovation among banks and TSPs in order to accomplish objectives like "blockchain consortium governance," "user identity integration," and "secure data sharing." As a result, it fosters a dynamic and inclusive banking ecosystem.

At present, our country has not yet incorporated the third-stage of open banking business. However, once we manage to progress to the third stage so-called "transactional information" of open banking in the future, which allows customers to authorize TSPs to submit transaction requests to banks," the BIMAC framework will be capable of fulfilling the requirements for bill payment, integrated payment, and online contract signing. By combining the advantage of traditional banking and blockchain technology, the team enables customers to register with their real identities while remaining anonymous on the blockchain so as to ensure privacy protection and data sharing. Meanwhile, it can also prevent regulatory agencies from losing their monitoring capabilities while achieving the goal of decentralization. The technology has been verified to support "contactless financial services" and "mobile identity verification apps" that the Financial Supervisory Commission R.O.C. strives to promote. It has the potential to serve as a core infrastructure for various integrated services in the future, ultimately enhancing the digital ecosystem of financial services.