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Organizational Identity Management Policies

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Abstract

Effective identity management is essential for secure organizational processes, but organizations often do not approach it strategically. To break this trajectory, organizational policymakers need to define a clear and sustainable identity management strategy. This paper presents an overview and guidelines to help shape such strategy. It analyzes the key characteristics and trade-offs of today's identity management models. Moreover, it offers practical recommendations for organizational policymakers when choosing among these models.

Keywords: Authentication, Digital Wallets, Identity and Access Management (IAM), Identity Models, Trade-offs

Introduction

Identity management challenges are as old as humankind. In the Book of Genesis, Jacob disguises himself with goat fur to confuse his father and steal his brother Esau's birthright. During the early days of Rome, Carthaginian general Hannibal used a signet ring taken from slain Roman consul Marcellus to deceive Rome's allies (Livius, 1943; Sheldon, 2015). These challenges continue in a digital world where secure but efficient identity management is essential for various organizational processes (Smith & McKeen, 2011; Windley, 2023).

Yet many organizations do not approach identity management strategically. Rather, organizations often purchase pre-packaged software solutions and assign the IT department responsibility for identity management. IT departments may be tempted to focus on security over usability, leading to inconvenient policies, such as rules for long and complex passwords or extensive multifactor authentication. As a result, users may spend more time authenticating or proving their identity than receiving the service.

To break this trajectory, we advocate for a strategic approach to identity management. Specifically, we propose that organizational policymakers define a strategy for managing their users' identity data. In what follows, we outline key policy questions that organizational policymakers should ask as they engage in developing an identity management strategy. We begin with a high-level description of today's dominant models for identity management and their strategic trade-offs in terms of control vs. responsibility and convenience vs. security. We then present recommendations for developing a fitting organizational policy.

Today's Identity Models and Their Trade-Offs

Organizational identity management is typically concerned with user authentication, source verification, and the storage of identity data. *User authentication* describes how users (persons, organizations, or IoT devices) can prove their identity as previously registered. These proofs are typically generated with so-called credentials or authentication factors. These factors can be "something the user knows" (e.g., a password), "something the user is" (e.g., face or fingerprint), or "something the user has" (e.g., an ID card, a temporary code, or a hardware token) (Benantar, 2005; Lacity et al., 2023; Windley, 2023). *Source verification* allows organizations to validate the correctness of identity claims made by a user, such as being a certain age or possessing a valid driver's license.

There are three identity management models available today to realize user authentication, source verification, and the storage of identity data: fragmented, federated, and wallet-based. While the fragmented and federated models are in use worldwide, the wallet-based model is being pushed in Europe, Canada, and a few US states. We describe each model in turn and contrast them in Table 1.

Table 1. Description and Organizational Trade-Offs Associated with the Three Identity Models

	Fragmented Model	**Federated Model**	**Wallet-based Model**
Description	***Enrollment and source verification:*** Users create an account with the organization and fill in a form with required identity attributes. When source verification of identity attributes is required, the organization must employ costly digital or in-person verification processes. ***Identification and authentication:*** Users log in to their account with a username-password combination or passkey as well as additional authentication factors if required.	***Enrollment and source verification:*** Users create an account with the organization and authorize their SSO provider to forward required identity attributes. When SSO providers do not offer source verification, the organization must employ the same processes as in the fragmented model. ***Identification and authentication:*** Users are redirected to their SSO provider, where they log in with a username-password combination or passkey as well as additional authentication factors if required.	***Enrollment and source verification:*** Users create an account with the organization and forward the required identity attributes from a digital wallet. The organization can easily verify the provided attributes using cryptographic checks that are sent together with the identity attributes. ***Identification and authentication:*** Users log in to their account with their digital wallet. Additional authentication factors are limited to those required to log in to the digital wallet app.
Control vs. responsibility	***Control:*** The organization collects and stores users' identity attributes. ***Responsibility:*** The organization is responsible for complying with regulatory requirements for the processing of user identity attributes.	***Control:*** The organization can outsource the collection and storage of identity attributes to SSO providers. ***Responsibility:*** The organization can delegate to the SSO provider some of the responsibility for complying with regulatory requirements for the processing of user identity attributes.	***Control:*** The organization can outsource the collection and storage of identity attributes to users. ***Responsibility:*** Users are responsible for managing their identity attributes and consenting to requests for presentation.
Convenience vs. security	***Convenience:*** Password management is tedious for users. Passkeys are more convenient but require users and the organization to abide by the rules of the passkey ecosystem. In both cases, source verification is slow, costly, and error-prone for the organization. ***Security:*** Security is limited without complex password rules, multifactor authentication, and user compliance with security policies.	***Convenience:*** SSO services are convenient for users and some SSO providers deliver source-verified identity data in a standardized format to the organization. ***Security:*** The likelihood of security incidents is low due to substantial security measures on the SSO provider side, but their impact can be severe.	***Convenience:*** Digital wallet apps are convenient for users and deliver source-verified identity data in a standardized format to the organization. ***Security:*** The likelihood and impact of security incidents are low as individual wallets are relatively unattractive targets for hacks.

The *fragmented model* describes the familiar experience of having separate accounts with username-password logins for each digital service. This model is easy to set up and gives organizations direct access to a trove of personal data that can be used, e.g., for marketing purposes. However, enrolling new users can be costly—especially when know-your-customer laws require organizations to verify physical identity documents. Moreover, when an organization stores sensitive identity data, securing the data against loss, unauthorized use, and hacks requires significant investment (Windley, 2023). The fragmented model also presents an undesirable trade-off between convenience and security when users need to choose unique and ever stronger passwords to keep up with mounting security threats. Password managers offer some help, but they are honeypots for hackers (Winder, 2023). Furthermore, user experience suffers when additional authentication factors are required and when they differ substantially across organizations. Some of these challenges can be addressed with so-called passkeys that replace username-password logins with cryptographic keys stored on mobile devices. Passkeys are highly secure by design and can be protected, for instance, with biometrics (FIDO Alliance, 2023). However, passkeys do not address costly enrollment and source verification problems (Yeoh et al., 2023).

The *federated model* mitigates these challenges. It limits the use of username-password logins, passkeys, and additional authentication factors to a small number of single sign-on (SSO) services by the likes of companies such as Alphabet, Apple, Meta, and Microsoft. The consistent authentication offered by the federated model makes it convenient for users. The federated model is also convenient for organizations, as they can outsource their responsibility for identity data management to SSO providers. However, ceding control over authentication to SSO providers can be problematic from a compliance and strategy perspective (Smith & McKeen, 2011). Source verification by SSO providers is also often limited, e.g., to phone numbers and driver's licenses. Moreover, cases abound in which SSO providers falsely blocked users and were slow to correct their mistakes (Hill, 2022). Lastly, SSO services are known for tracking user behavior on the web (Zuboff, 2015).

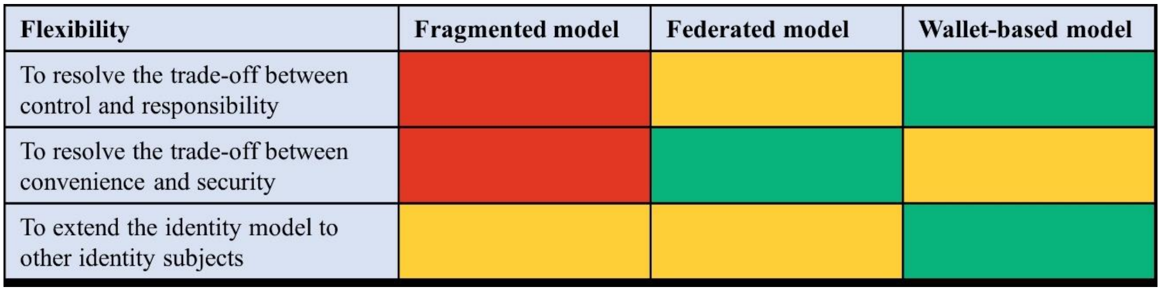
The *wallet-based model* is different in that it puts more control and responsibility for identity management on users. The European Union, along with several Canadian provinces and a few US states, is touting it as the future of identity management (Rieger et al., 2022; Sedlmeir et al., 2021). Under this model, users collect cryptographically verifiable identity attributes from trustworthy issuing organizations. The wallet-based model is convenient for users because digital wallets make passwords and multifactor authentication redundant (Lacity et al., 2023). It can also drastically reduce enrollment, source verification, and authentication costs. The downsides of the wallet-based model are that it is still immature and requires compatibility with identity wallets and solutions for device loss or theft. Moreover, organizations need to define policies for the trustworthiness and acceptance of identity attributes from different issuing organizations.

Three Recommendations for Organizational Policymakers

Identity management seems to be a rather mundane topic to some organizations, but it is a Rosetta Stone for solving many of the challenges organizations face in their processes today. We thus encourage organizational policymakers to take a strategic approach to identity management and carefully choose between the three different models. We next present three recommendations for making this choice.

Organizational policymakers should first consider the trade-off between control and responsibility. User and usage data can be highly relevant for some organizations, be it for the personalization of services, market segmentation, or the identification of opportunities for cross- and upselling. For these organizations, the costs associated with collecting and storing identity data may be well spent. If the organization is not using this data productively, outsourcing its protection to SSO providers may be wise. Yet, outsourcing identity management to SSO providers introduces strategic dependencies. Alternatively, they can ask their users to assume more responsibility. This can be helpful to reduce the organization's costs for secure storage of identity data and to support users across jurisdictions. However, controlling one's own identity data can be demanding for users. Increased user agency requires educated users (e.g., in terms of how to detect phishing attacks, how to create backups for recovery, etc.), and many users may not be skilled enough to manage their data or willing to tolerate high levels of responsibility.

Second, organizational policymakers should strike a balance between convenience and security. External SSO services may be convenient and more secure than most organizational services but do not always offer the required levels of source verification. For some organizations, the balance will need to be on the side of security. Compromised medical or financial processes, for instance, are not only embarrassing but can have serious consequences for affected users. For these processes, federated or wallet-based models may be the better choice. Where instances of incorrect identity data are inconsequential, policymakers should also consider whether identity data requires costly source verification.



Flexibility	Fragmented model	Federated model	Wallet-based model
To resolve the trade-off between control and responsibility	🟥	🟨	🟩
To resolve the trade-off between convenience and security	🟥	🟩	🟨
To extend the identity model to other identity subjects	🟨	🟨	🟩

Figure 1. Flexibility Associated with the Three Identity Models.

Finally, organizational policymakers should think beyond customer identities before selecting a model. Using the same model to manage identities and access for customers and employees, suppliers, partner organizations, and even IoT devices may substantially reduce complexity and costs (Glöckler et al., 2023; Guggenberger et al., 2023; Sedlmeir et al., 2023). In this regard, the wallet-based model may trump the other two models. Policymakers should also consider the political landscapes in which they operate. In certain industries and certain countries, regulators may mandate certain identity models. The European Union, for instance, will mandate the wallet-based model for customer identity management in various industries (European Commission, 2024). Organizational policymakers should be aware of these mandates and consider adopting the same model for other users to streamline IT processes across the organization.

Figure 1 summarizes these recommendations and offers an indication of the ability of the three identity models to align with them. While the federated and wallet-based models may often provide more flexibility than the fragmented model, it is important to carefully consider their strategic implications. Ultimately, there is no "fire and forget" solution for identity management. Instead, identity management is a challenge that requires organizational policymakers to take stock of their organizations' needs and resources, carefully consider the available models, and adapt to changes in the identity market (Smith & McKeen, 2011). Organizations should regularly revisit their identity management policies to keep up with developments in the digital landscape, including security trends, regulatory changes, and technological advancements.

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