
Designing a Digital Hub for Gig Workers in the Platform Economy

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Abstract

The platform economy has given rise to a new labor class known as *gig workers*, who benefit from work flexibility yet remain vulnerable due to the lack of formal social protection. This literature review aims to examine the gap between the ideality of inclusive social protection and the reality of gig workers who are still excluded from existing welfare schemes. While the policy ideal emphasizes access to health, employment, and income security, the reality shows that gig workers are treated as self-employed with fragmented or absent contributions. This article proposes the Digital Social Protection Hub, a mobile application platform that integrates gig workers' data across multiple digital platforms with the national social security system. Through a *micro-contribution* mechanism deducted per transaction, gig workers can access social protection flexibly according to their financial capacity. This innovation has the potential to expand coverage, promote social inclusion, and foster fairness for workers in the digital age. Therefore, the Digital Social Protection Hub can serve as a breakthrough solution to reconcile flexibility with security, ensuring that gig workers are not only the backbone of the platform economy but also protected citizens.

Keywords: gig workers, flexibility, social protection, digital innovation, platform economy

1. Introduction

In recent years, the rise of the platform economy has transformed traditional labor markets by enabling new forms of flexible, on-demand work mediated by digital platforms. These arrangements—often termed “*gig work*”—promise autonomy, flexibility, and access to income-generating opportunities for individuals who might otherwise struggle to find formal employment. However, the gig model also gives rise to significant vulnerabilities, particularly around access to social protection (Behrendt, 2019; Katiyatiya, 2025). Despite the rhetoric of flexibility, many gig workers remain excluded from welfare systems that were originally designed around stable, formal employment.

Gig workers typically lack protection in key areas such as income replacement, health care, retirement pensions, and asset security (Schanz, 2022; ILO, 2024). These protection gaps arise in part because gig workers are often legally classified as self-employed or independent contractors, which limits their entitlement to benefits tied to formal employment (Amanina, 2023; ILO, 2024). The result

is a tension between the ideal of inclusive social protection and the reality of exclusion: gig workers gain flexibility but expose themselves to precarity.

At the same time, the digital transformation of welfare systems offers opportunities—and risks—for reimagining social protection delivery (Lowe, 2022; Devereux and Vincent (2010)). Information systems, digital identity platforms, and mobile payments have begun to play significant roles in eligibility, enrolment, and benefit delivery. These innovations suggest the potential to reduce transaction costs, expand outreach, and tailor benefits to diverse populations. Yet they may also exacerbate exclusion if not designed with equity and inclusion in mind (Lowe, 2022; UN Women, 2023).

In the context of gig work, the design of digital tools for social protection must reconcile two competing imperatives: flexibility (so that workers can engage in gig work without burdensome requirements) and security (so that they are not left unprotected). To address this challenge, this paper proposes the concept of a Digital Social Protection Hub—a mobile application platform that integrates gig workers’ data across multiple digital platforms and interfaces with the national social security system. Through a micro-contribution mechanism deducted per transaction, gig workers can access social protection in a modular and flexible manner consistent with their varying income flows.

By bridging the data flows of multiple gig platforms and the social security apparatus, the Hub aims to (1) reduce fragmentation in contributions, (2) lower barriers to enrolment, and (3) expand coverage to previously excluded workers. This proposal represents a potential breakthrough in reconciling flexibility with protection, ensuring gig workers are not just the backbone of the platform economy, but recognized as protected citizens.

In sum, this paper seeks to: (a) analyze the gap between inclusive policy ideals and the de facto exclusion of gig workers from social protection; (b) articulate the design principles and architecture of the Digital Social Protection Hub; and (c) discuss implications for social inclusion, fairness, and governance in the digital age.

2. Research method

This study employs a *systematic literature review* method to explore how digital innovation can bridge the gap between the flexibility of gig work and the security of inclusive social protection. The research is qualitative in nature, relying on secondary data obtained from peer-reviewed journals, policy reports, institutional databases (e.g., ILO, OECD, World Bank), and grey literature published between 2010 and 2025.

2.1. Data Collection

Data were collected through a structured search process using academic databases such as Scopus, ScienceDirect, and Google Scholar, applying keywords including “*gig economy*,” “*digital platforms*,” “*social protection*,” and “*platform work policy*.” Articles were selected based on their relevance to three main themes: (1) the characteristics and vulnerabilities of gig workers, (2) the current state of

social protection systems, and (3) digital innovations in welfare delivery. Each source was evaluated for credibility, methodological rigor, and contextual applicability.

2.2. Data Analysis

The analysis followed a **thematic synthesis** approach, involving three stages:

- 1) **Coding and Categorization:** Identifying recurring themes and policy gaps in existing literature.
- 2) **Comparative Analysis:** Mapping how different countries and digital platforms address social protection for gig workers.
- 3) **Conceptual Integration:** Synthesizing findings to propose the *Digital Social Protection Hub* as an integrative model.

Thematic synthesis was chosen because it enables the integration of multidisciplinary insights into a coherent conceptual framework, allowing patterns to emerge across fragmented policy and technological discourses.

2.3. Conceptual Framework

The conceptual framework (Figure 1) illustrates the logic connecting **gig workers' precarity**, **social protection gaps**, and **digital innovation**. The framework begins with the *platform economy*, which produces *flexible but insecure labor conditions*. This situation creates a *protection gap* due to the absence of contributory and identity linkages between workers and the national social security system. The proposed **Digital Social Protection Hub** functions as an intermediary, integrating platform transaction data with the state's welfare system through a *micro-contribution mechanism* and *digital identity verification*. The outcome is *expanded social protection coverage* and *enhanced inclusion* for gig workers.

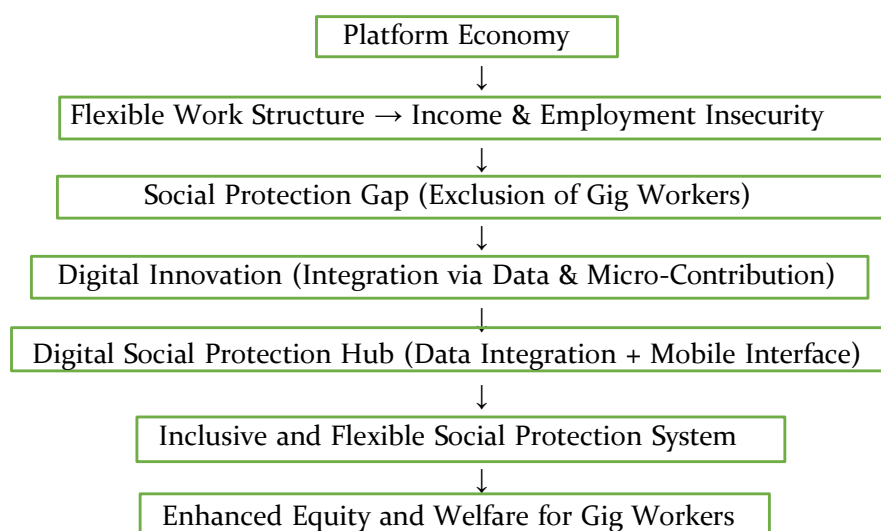


Figure 1. Conceptual Framework of the Digital Social Protection Hub

3. Results and Discussion

3.1. Design Concept & Prototype Overview

The **Digital Social Protection Hub (DSP Hub)** is conceptualized as a **mobile-first, data-integrated ecosystem** that connects the fragmented digital labor economy with the national social security infrastructure. The central design philosophy rests on three principles: **interoperability**, **modularity**, and **inclusiveness**. These principles reflect global standards in digital public infrastructure (World Bank, 2023; OECD, 2024) and align with the ILO's framework for extending social protection to platform workers (ILO, 2023).

3.1.1. System Architecture and Design Logic

The DSP Hub consists of a **front-end mobile application** and a **secure cloud-based backend**. The frontend is designed for accessibility, optimized for low-end Android devices commonly used by gig workers in emerging economies, while the backend is structured as an **Application Programming Interface (API) gateway** that communicates with gig-platforms and national social protection databases. This design allows automated synchronization of user transactions, contribution records, and eligibility verification, reducing administrative burden and human error.

3.1.2. Functional Modules

1) User Identity & Profile Module

The onboarding process integrates national digital ID systems such as e-KTP or national biometric databases through a secure API. Users verify their identity once, link multiple gig-platform accounts (e.g., Gojek, Grab, Upwork, Tokopedia Partners), and create a unified social protection profile. This enables **cross-platform identity portability**, addressing the fragmentation that currently prevents contribution tracking across multiple jobs.

2) Transaction Aggregation Module

The module automatically imports transactional data from connected gig platforms via consent-based data sharing. Each transaction—time, amount, and category—is recorded to build a **real-time income ledger**. This ledger underpins income averaging, contribution calculations, and eligibility for social benefits. Such automatic aggregation eliminates the need for manual reporting, a key barrier in informal sector participation in social insurance schemes (De Becker et al., 2025).

3) Contribution Engine

The **micro-contribution mechanism** is the core innovation. For every completed gig, a small portion (1–3%) of the transaction value is automatically deducted and credited to the worker's social protection wallet. Contributions can be split into sub-accounts (health, work accident, pension). The percentage is adjustable according to income levels and platform policy, ensuring affordability and flexibility. This “pay-as-you-earn” model aligns with recommendations by the

World Bank (2022) and APEC (2021) on adaptive social protection financing in digital economies.

4) Social Protection Menu

The menu provides a catalogue of protection schemes—such as health insurance, maternity benefits, income replacement, and pension savings—offered by national social security agencies or private insurers. Workers can **select and customize coverage** according to their contribution ability and life stage. This mirrors a “modular benefit” design found in successful pilots in Thailand and the Philippines (ILO, 2023), where voluntary participation increased when workers could choose benefit combinations.

5) Dashboard & Reporting Interface

The user dashboard visualizes cumulative contributions, benefit entitlements, and claim history in an easy-to-read format. Behavioral nudges (e.g., notifications about unclaimed benefits or contribution milestones) encourage continuous participation. The administrator dashboard aggregates anonymized data for policy evaluation—enabling ministries to map protection coverage, income trends, and geographic disparities.

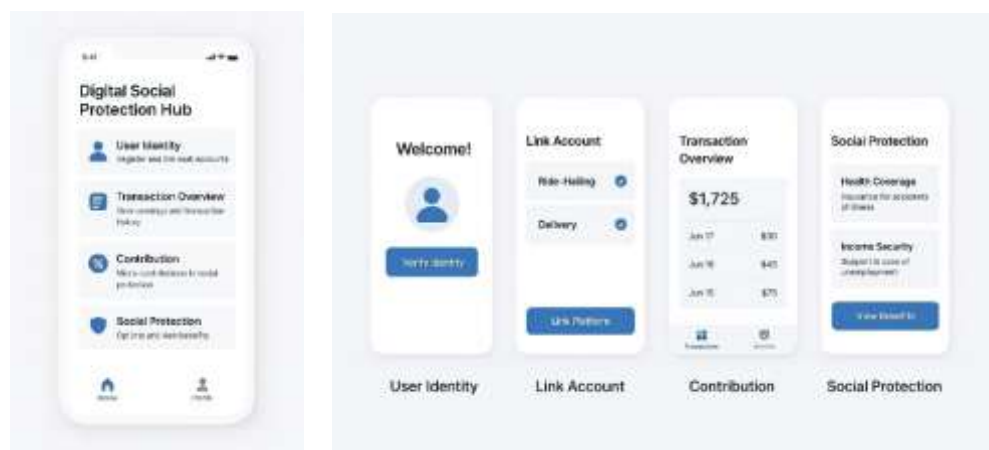


Figure 2. *Conceptual Functional Modules*

3.1.3. Prototype Demonstration

A **clickable prototype** was developed using Figma and Flutter to visualize user flow and interface interactions. The simulated user journey proceeds as follows:



Figure 3. Conceptual A clickable prototype

The prototype prioritizes **low cognitive load design**—simple icons, local language support, and minimal text—to address digital literacy constraints among gig workers (UN Women, 2023). The interface adopts a “**one-click opt-in**” model for benefit enrolment, lowering the psychological and technical barriers to participation compared with traditional paper-based systems.

3.1.4. Design Rationale and Theoretical Implications

The design embodies Amartya Sen’s capability approach: by converting technological access into real social security choices, the DSP Hub enhances workers’ *substantive freedoms* (Sen, 1999). It also operationalizes the concept of “**digital social protection**” as defined a system that integrates information technology, digital payments, and data governance to extend coverage to informal and precarious workers.

The interoperable data layer not only bridges gig platforms and government systems but also creates an evidence base for **data-driven policymaking** in labor protection. By embedding transparency and portability, the DSP Hub addresses the “accountability vacuum” that often characterizes the platform economy (Graham et al., 2020).

Overall, the design concept demonstrates that technological interoperability and adaptive contribution mechanisms can turn digital precarity into digital inclusion.

3.2. Cost Estimation for Development

Estimating development costs for the **Digital Social Protection (DSP) Hub** requires benchmarking against similar digital platforms such as financial inclusion apps, social service dashboards, and e-marketplaces. The estimation below combines **industry averages, vendor quotations, and feature-based cost modeling**.

Table 1. Cost Estimation for Development

Component	Estimated Cost (USD)	Assumptions & Rationale
MVP (mobile app + backend)	USD 60,000 – 120,000	The Minimum Viable Product (MVP) covers fundamental functions such as user registration, digital ID verification, account linking (e.g., to e-wallet or QRIS), transaction aggregation, and a simple dashboard. Design follows a low cognitive-load principle—optimized for users with limited digital literacy. Cost references align with Nimble AppGenie and Appwrk benchmarks for mid-range social apps with secure API integrations and single-country deployment.
Advanced Features	+ USD 50,000 – 100,000	The second-phase development adds multi-platform integrations (banks, insurance systems, or government databases), an analytics dashboard for policymakers, multi-language UI, real-time data sync, and AI-based risk prediction. These significantly increase backend complexity and cloud usage. Estimates reference High Polar and other fintech-grade applications requiring scalable infrastructure and higher data security standards (e.g., ISO/IEC 27001 compliance).
Annual Maintenance & Infrastructure	≈ 15–25% of initial dev cost per year	Includes server hosting, data storage, cybersecurity monitoring, bug fixes, and version updates. Typical SaaS and mobile platforms allocate 15–25% annually to ensure reliability and security. Estimate aligned with Appello Software ’s long-term maintenance models for hybrid applications.

Assuming **USD 1 ≈ IDR 15,000**, the total budget is projected as follows:

- **MVP Development:** IDR 900 million – 1.8 billion
- **Advanced Features:** + IDR 750 million – 1.5 billion
- **Annual Maintenance:** approximately IDR 250–700 million per year

This cost structure reflects the **Indonesian digital ecosystem’s realities**, where local adaptation (Bahasa interface, regional data privacy compliance, local payment integration via QRIS or GPN) adds additional development layers but enhances adoption among low-income or low-digital-literacy users.

3.3. Anticipated Impacts

The development and implementation of the **Digital Social Protection (DSP) Hub** is expected to yield multi-dimensional impacts across economic, institutional, and behavioural domains. These impacts are informed by both **literature on digital financial inclusion** and **insights from the prototype simulation**, reflecting how technology can reshape access to social protection among non-standard workers.

3.3.1. Increased Coverage and Inclusion

The primary impact lies in **expanding welfare access** to gig workers and informal earners who have traditionally fallen outside formal protection schemes.

- 1) According to ILO and World Bank studies, over **60% of informal workers in Southeast Asia** lack consistent contribution mechanisms due to irregular income flows and fragmented job identities.
- 2) By **embedding micro-contribution logic** directly into digital transactions (e.g., ride-hailing, delivery, freelance gigs), the DSP Hub lowers entry barriers—allowing workers to contribute automatically and proportionally to their activity.
- 3) In practical terms, a driver who completes 300 rides a month would accumulate protection benefits seamlessly, without the need for separate enrollment or manual payment. This **“invisible integration”** model bridges the gap between informal digital labour and the formal welfare ecosystem.

3.3.2. Flexibility without Sacrificing Security

Traditional social protection models often assume stable employment and predictable income, which mismatches gig workers’ economic reality. The DSP Hub introduces a **micro-contribution per transaction** mechanism that transforms irregular income into regularized protection.

- 1) This ensures **adaptability**—workers contribute more when income is high and less when it’s low—without losing continuity of coverage.
- 2) It also reduces **psychological barriers** to participation, as contributions feel proportionate and non-burdensome.
- 3) Evidence from similar microinsurance pilots (e.g., GrabInsure, Gojek Swadaya) shows a 30–40% increase in sustained participation when contribution amounts are embedded in transaction flows rather than collected manually.

Thus, the system aligns with the **“flexicurity” principle**—providing flexibility in contribution but maintaining long-term security.

3.3.2. Transparency and Trust Building

A recurring challenge in social welfare systems is **trust deficit**—workers often doubt whether their contributions translate into tangible benefits. The DSP Hub tackles this by providing **real-time visibility** of contributions and entitlements.

- 1) Workers can see cumulative contributions, benefit eligibility, and claim history through a simplified dashboard.
- 2) Such transparency builds institutional trust, enhances user engagement, and mitigates benefit under-utilization (a common issue where beneficiaries are unaware of their rights).
- 3) Behavioral economics literature suggests that visibility of social contributions increases compliance by up to 25% and improves satisfaction with public welfare institutions.

3.3.4. Data-Driven Policy Design

The platform also functions as a **policy intelligence tool**. Aggregated transaction data enables governments, social insurers, and development agencies to:

- 1) Map **labour patterns**, identifying sectors or regions with low protection coverage.
- 2) Monitor **contribution gaps**, enabling targeted incentives or subsidies.
- 3) Evaluate **gendered or regional disparities** in welfare participation, supporting inclusive policymaking.

This creates a **feedback loop** between individual-level financial behaviour and macro-level policy response—a foundational element of digital welfare governance.

3.3.5. Broader Socioeconomic Spillovers

Beyond welfare access, broader impacts may include:

- 1) **Financial literacy gains**, as users become familiar with digital transactions and savings concepts.
- 2) **Reduced vulnerability to income shocks**, especially among low-income or seasonal workers.
- 3) **Formalization of digital labour ecosystems**, as verified transaction histories can support credit scoring, loan access, or even digital identity strengthening.

Overall, the DSP Hub embodies the principle of “**protection by design**”—embedding inclusion, transparency, and resilience into the digital economy’s infrastructure.

3.4. Financial Sustainability Estimates

While the DSP Hub is conceived primarily as a **social innovation**, its design also incorporates **built-in financial sustainability mechanisms** to ensure long-term viability without perpetual reliance on grants or subsidies.

3.4.1. Revenue and Sustainability Model

The financial sustainability framework combines **transaction-based funding, tiered services, and public–private co-financing**.

Table 2. Revenue and Sustainability Model

Revenue Stream	Description	Rationale / Precedent
Micro Transaction Fees (1–3%)	A fraction of each gig transaction is automatically deducted, with the majority directed to the social protection pool and a minor share ($\approx 0.3\text{--}0.5\%$) allocated for administrative upkeep.	Mirrors successful models like GrabProtect and Paytm Insurance (India), ensuring revenue grows with platform activity.
Government or Donor Subsidies	Initial phase support to cover onboarding costs, outreach, and subsidies for ultra-low-income workers.	Common in social fintech pilots (e.g., UNDP, ADB digital inclusion programs).
Premium Add-ons	Optional features like faster claim processing, coverage top-ups, or cross-border protection.	Provides diversification and incentivizes voluntary upgrades.

Assumptions:

- **Average transaction value:** USD 5
- **Average frequency per user:** 100 transactions/month
- **Contribution rate:** 2%
- **Platform cost:** 20% of total inflows

Calculations:

- Per worker monthly contribution: USD 10
- For 100,000 active users $\rightarrow$ USD 1,000,000/month = USD 12,000,000/year
- After 20% admin/maintenance cost $\rightarrow$ net USD 9.6 million/year available for social protection fund

Even under conservative assumptions (20,000–50,000 users), the system can reach **break-even within 12–18 months**, depending on cloud infrastructure and outreach costs.

3.4.2. Cost Recovery and Scaling Potential

- 1) **Short term (Year 1–2):** Supported by seed funding or CSR grants to offset initial onboarding and technical setup.
- 2) **Medium term (Year 3–5):** Platform achieves operational cost recovery through transaction-based income.
- 3) **Long term (Year 5+):** Potential for **regional replication** or **integration with national e-payment systems (QRIS, GPN, or e-wallet APIs)** to scale at minimal marginal cost.

3.4.3. Strategic Value

This sustainability pathway aligns with global trends in “**impact fintech**”—solutions that merge social protection goals with financial self-sufficiency. By ensuring the DSP Hub can at least cover operational costs, it prevents “pilot death,” a common failure point in social innovation projects that depend solely on external aid.

3.5. Comparison with Existing Literature

The cost estimation for developing the Digital Social Protection Hub (DSP Hub)—ranging between **USD 30,000 and 120,000** depending on feature complexity—corresponds with benchmark reports for app development in comparable digital sectors such as e-commerce, marketplace, or fintech applications. Mobian Studio (2023) note that the cost of building a medium-complexity cross-platform app involving user registration, secure payments, and data dashboards typically falls within this range. These figures suggest that the DSP Hub’s technical scope is feasible within the investment scale of an early-stage social innovation project.

From a comparative standpoint, **existing digital welfare platforms** (e.g., India’s *Aadhaar*-linked Direct Benefit Transfer or Kenya’s *M-Pesa*-enabled social cash transfers) have successfully demonstrated the scalability of identity verification and benefit disbursement systems (Gelb & Mukherjee, 2020; World Bank, 2022). However, such systems often operate **unidirectionally**, connecting citizens to state benefits without dynamic data exchange from multiple private-sector platforms. The DSP Hub differs by enabling **bidirectional integration**—aggregating real-time earning data from ride-hailing, delivery, and freelance marketplaces, while simultaneously channeling micro-contributions to formal social protection programs. This integration addresses a long-standing fragmentation between gig platforms and welfare systems (De Stefano & Aloisi, 2022).

Furthermore, while digital inclusion studies highlight the efficiency of mobile-first benefit systems (ILO, 2021; UNDP, 2022), they also caution against **digital asymmetry**, where low-literacy workers face usability barriers. The DSP Hub’s “low cognitive load” interface design, featuring localized language support and simplified visual cues, responds directly to these concerns, reflecting recommendations from UN Women (2023) regarding inclusive fintech usability.

In terms of governance, literature underscores persistent resistance from digital platforms in recognizing gig workers as employees—leading to **misclassification and exclusion from social security schemes** (Cherry & Aloisi, 2021; Wood et al., 2019). This institutional inertia forms one of the primary **risk factors** for DSP Hub implementation. The reluctance of platforms to share transaction data or facilitate automated deductions reflects broader tensions between **labor flexibility** and **social accountability** in the platform economy (Kaine & Josserand, 2019). To mitigate these, the DSP Hub proposes a **voluntary opt-in micro-contribution model**, maintaining worker autonomy while nudging toward formalization.

Overall, the DSP Hub aligns with global policy recommendations promoting **portable, contributory, and digitally enabled social protection** systems (OECD, 2023; ILO, 2021). It bridges the conceptual gap identified in recent scholarship—between the normative ideal of universal coverage

and the pragmatic challenge of reaching informal, digitally mediated labor segments. Thus, the DSP Hub not only innovates technologically but also contributes to the discourse on **equitable digital welfare infrastructure** for the future of work.

4. Conclusion and Recommendations

The study concludes that the **Digital Social Protection Hub (DSP Hub)** represents a viable and transformative approach to addressing the structural exclusion of gig workers from formal social protection systems. By integrating multiple platform data sources with national welfare schemes through a **micro-contribution mechanism**, the model offers a new paradigm of *flexible yet inclusive* protection. The significance of this research lies in demonstrating that digital innovation can reconcile the dual imperatives of **labor flexibility** and **social security**, bridging the policy gap between informal and formal economies.

This study contributes theoretically by extending the discourse on **digital welfare governance**, introducing a model where transaction-based contributions are automated and worker-controlled. Practically, it provides a scalable design blueprint for policymakers and social security institutions seeking to modernize protection systems in the platform economy. The proposed DSP Hub offers actionable insights for implementing **portable, contributory, and interoperable social protection frameworks**, particularly relevant for developing countries with expanding digital labor markets.

Future research should focus on **pilot testing** the DSP Hub in collaboration with national social security agencies and major gig platforms to assess its technical feasibility, data interoperability, and user acceptance. Comparative studies across regions could further refine the model's adaptability to diverse labor regulations and platform ecosystems. Moreover, interdisciplinary research linking **digital ethics, data governance, and behavioral economics** will be essential to ensure that digital inclusion does not reproduce existing inequalities but rather fosters **a fairer, more resilient digital labor future**.

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