NEXT GENERATION INTERNET

GNU Taler: Privacy for Inclusion, Free Software for Innovation

Future Finance Fest

What is Taler?

Taler is an open payment *protocol*.

Taler is an open payment *protocol*.

► GNU Taler a Free/Libre software *payment system* infrastructure project with a surrounding software ecosystem and a community that wants to deploy it as widely as possible.

Taler is an open payment *protocol*.

▶ GNU Taler a Free/Libre software *payment system* infrastructure project with a surrounding software ecosystem and a community that wants to deploy it as widely as possible.

▶ Taler Systems S.A. is a company offering commercial support.

What is Taler?

However, Taler is

- ▶ *not* a currency or speculative asset
- ▶ *not* a long-term store of value
- ▶ *not* a network or instance of a system
- ▶ *not* decentralized
- ▶ *not* based on proof-of-work or proof-of-stake

Design principles

GNU Taler must …

1. … be implemented as **free software**.
2. … protect the **privacy of buyers**.
3. … enable the state to **tax income** and crack down on illegal business activities.
4. … prevent payment fraud.
5. … only **disclose the minimal amount of information necessary**.
6. … be usable.
7. … be efficient.
8. … avoid single points of failure.
9. … foster **competition**.

Architecture
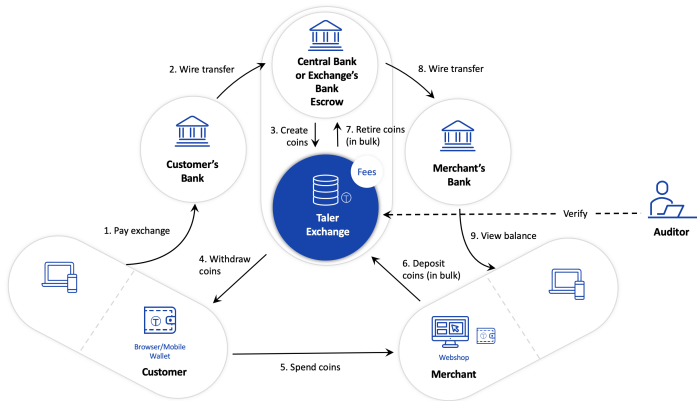
NGI TALER

- ► EU Project started December 2023 to deploy GNU Taler
- ► 3 financial institutions (GLS Bank, Magnet Bank, Visual Vest), 2 academic institutions (Berner FH, TU Eindhoven), 3 SMEs (Taler Systems SA, Code Blau GmbH, Petit Singularites), 3 non-profits (NLnet Foundation, E-Seniors Association, Homo Digitalis)
- ► $\approx$ € 5M budget over 3 years
- ► Objective: **Deploy GNU Taler in Europe**

Launch Timeline

Q2'2022	Internal deployment at BFH
Q4'2024	Deployment of local currency Netzbon in Basel
Q2'2025	Public deployment of eCHF in Switzerland
Q4'2025	Magnet bank launches in Hungary (?)
Q1'2026	GLS bank launches in Eurozone (?)

Public Operators

- ▶ `https://netzbon.ch/` is site of deployment in Basel (**NETZBON**)
- ▶ `https://exchange.e.netzbon-basel.ch/` hosts production REST API
- ▶ `https://taler-ops.ch/` is site of Taler Operations AG, Biel (**CHF**)
- ▶ `https://exchange.taler-ops.ch/` hosts production REST API
- ▶ `https://gls.de/taler/` main site for Taler at GLS Bank (**EUR**)

What software exists?

- ▶ libeufin-nexus: EBICS integration
- ▶ libeufin-bank: regional currency bank
- ▶ merchant backend: REST API with inventory and order management
- ▶ payment plugins: Joomla!, Magento, WooCommerce
- ▶ challenger: address (postal, sms, e-mail) validation (OAuth2 API)
- ▶ exchange: Taler core system with AML/KYC processes for compliance
- ▶ wallets: for Android, Chromium/Chrome, Firefox, iOS, …

Taler is licensed under LGPL (rarely), GPL (wallets) or AGPL (servers).

What can you do today?

- ► Add any Taler provider to your wallet
- ► Withdraw digital cash via SEPA transfer
- ► Deposit digital cash back into your bank account
- ► Make P2P payments
- ► Setup your own merchant / e-commerce site to receive payments
- ► Setup your regional / event currency

What software is the community working on?

- ► Sync: backup service
- ► GNU Anastasis: distributed zero-knowledge key backup
- ► Mailbox: send payment messages to remote Taler wallets (instead of NFC/QR code)
- ► TalDir: map e-mail address or phone number to Taler wallet Mailbox address
- ► Adorsys-OBG: automate withdrawal via PSD2

Finance and Academia

GNU Taler is unique:

- ▶ Free/Libre Open Source retail payment system
- ▶ originating from research
- ▶ escaped the lab into production

Finance and Academia

GNU Taler is unique:

- ▶ Free/Libre Open Source retail payment system
- ▶ originating from research
- ▶ escaped the lab into production
- ▶ *remaining* open for research!

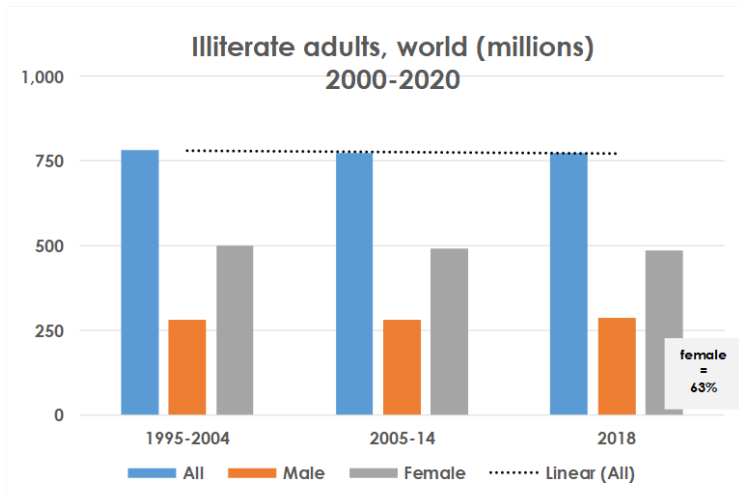$\Rightarrow$ opportunities for collaboration!

Example: Oral Information Management (OIM)

OIM is a human-centered design practice governed by the following principles:

1. Designs must first enhance client-side financial product usability.
2. Designs should provide positive incentives to clients to acquire useful financial numeracy and financial literacy skills.
3. The design process is client-guided.
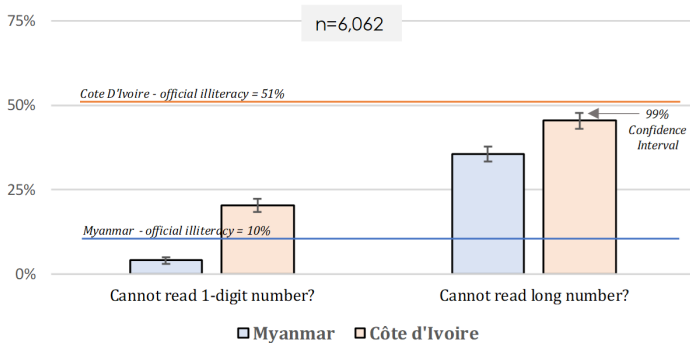4. Oral designs should not embarrass or inconvenience or literate clients.

Literacy

Illiterate adults, world (millions) 2000-2020

Numeracy

Error Rate
Financial Inclusion Insights Wave 5 (2017)

n=6,062

Cote D'Ivoire - official illiteracy = 51%

99% Confidence Interval

Myanmar - official illiteracy = 10%

Cannot read 1-digit number?   Cannot read long number?

☐ **Myanmar** ☐ **Côte d'Ivoire**

Design

89 SLE   39 SLE

Results from Freetown (2025)

- ▶ Twenty-one (21) women speaking 6 local languages were briefed on how to send money in the OIM Taler prototype.

Results from Freetown (2025)

- ► Twenty-one (21) women speaking 6 local languages were briefed on how to send money in the OIM Taler prototype.
- ► Of these only 4 had completed primary school, and only 6 could read a 5-digit cash (ordinal) number.

Results from Freetown (2025)

- ► Twenty-one (21) women speaking 6 local languages were briefed on how to send money in the OIM Taler prototype.
- ► Of these only 4 had completed primary school, and only 6 could read a 5-digit cash (ordinal) number.
- ► After 24 hours they were presented a Taler wallet with a random sum in new leone tokens. They were asked to count the money, and complete 8 tasks to send some to another person by generating a scannable QR code.

Results from Freetown (2025)

- ► Twenty-one (21) women speaking 6 local languages were briefed on how to send money in the OIM Taler prototype.
- ► Of these only 4 had completed primary school, and only 6 could read a 5-digit cash (ordinal) number.
- ► After 24 hours they were presented a Taler wallet with a random sum in new leone tokens. They were asked to count the money, and complete 8 tasks to send some to another person by generating a scannable QR code.
- ► Sixteen (16) completed all 8 tasks with no errors.

Results from Freetown (2025)

- ► Twenty-one (21) women speaking 6 local languages were briefed on how to send money in the OIM Taler prototype.
- ► Of these only 4 had completed primary school, and only 6 could read a 5-digit cash (ordinal) number.
- ► After 24 hours they were presented a Taler wallet with a random sum in new leone tokens. They were asked to count the money, and complete 8 tasks to send some to another person by generating a scannable QR code.
- ► Sixteen (16) completed all 8 tasks with no errors.
- ► Four (4) completed all 8 tasks with two tries but no help. Only one was unable to complete the process successfully.

Voices from Freetown (2025)

- "This app is much better than Afrimoney. Everyone would use it."

Voices from Freetown (2025)

- ▶ "This app is much better than Afrimoney. Everyone would use it."
- ▶ "It's simple, and you can correct your mistakes."

Voices from Freetown (2025)

► "This app is much better than Afrimoney. Everyone would use it."
► "It's simple, and you can correct your mistakes."
► After the test, participants were asked if they would use OIM Taler, if it were available in Sierra Leone? All (!) stated that they:
  ► would like to use it,
  ► prefer it to existing apps, and
  ► would share it with their friends and relations, especially those who had trouble with writing and numbers.

Finance and Academia (cont.)

More is happening:

- ▶ Post-quantum safe protocol design (TU/e)
- ▶ Subscriptions and discount tokens (BFH)
- ▶ Privacy-preserving tax-deductable donation receipts (NLNET+BFH)
- ▶ M2M/IoT payments with embedded wallets (TUD)
- ▶ Programmable payments (TUB)
- ▶ …

Finance and Academia (cont.)

More should be happening:

- ▶ Improved accounting integration
- ▶ Personal finance management (on-device!)
- ▶ Share tokenization
- ▶ . . .

⇒ Join us with **your** ideas!

How to support?

```
     Join: https://lists.gnu.org/mailman/listinfo/taler
    Learn: https://tutorials.taler.net/
  Discuss: https://ich.taler.net/
   Report: https://bugs.taler.net/,
  Develop: https://git.taler.net/
    Apply: https://nlnet.nl/taler
Translate: https://weblate.taler.net/,
           translation-volunteer@taler.net
Integrate: https://docs.taler.net/
```

Workshop overview

- ▶ Installing the GNU Taler wallet
- ▶ Demo time:
  - ▶ Withdrawing
  - ▶ Paying
  - ▶ Sending
  - ▶ Invoicing
  - ▶ Depositing
- ▶ Merchant backend SPA tour
- ▶ Creating an order via the REST API

Acknowledgements