Lunar & Thought Machine

Modernizing the Core Systems of Lunar
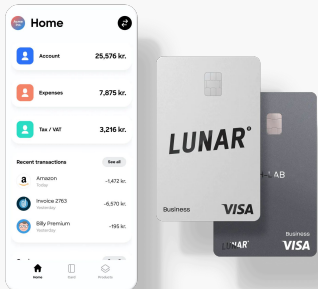
June 7th 2022

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Lunar
Thought Machine

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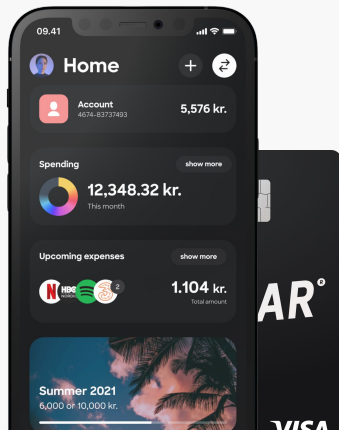
15,000
Total number of Business Customers

700
Employees

European Banking License issued in Denmark in 2019

We have offices in these locations

Copenhagen

Stockholm

Oslo

Aarhus

500,000
Customers in total

€400m
Total amount raised

Series D ✔
Recently closed our Series D of €210m and an additional €70m

Company founded in 2015

Private Customers

500K
Users

1m
jan-23

2m
jan-24

LUNAR
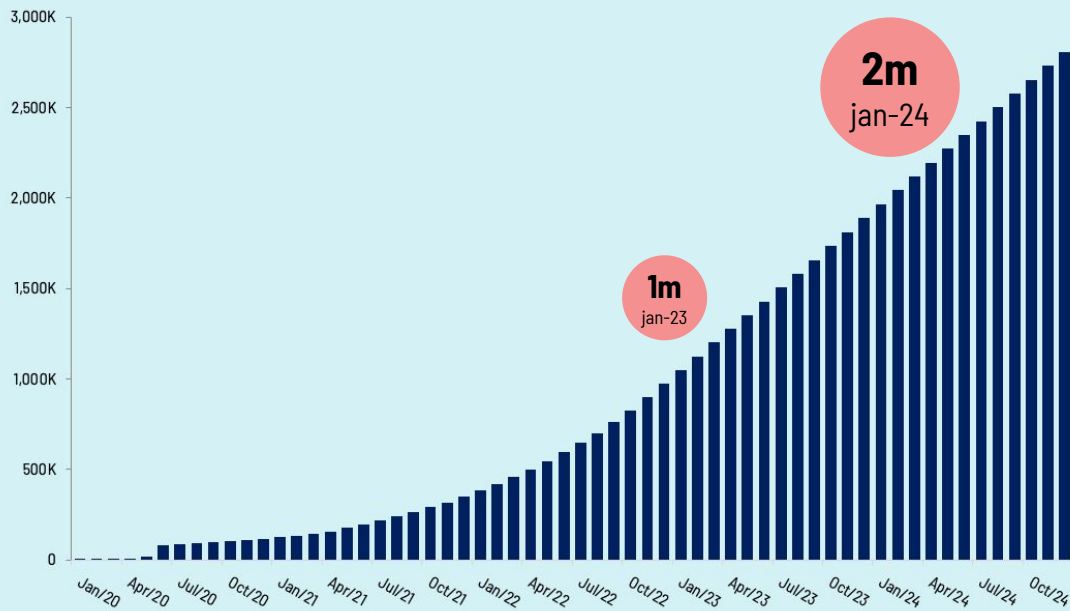
Lunar's mission:
Money engagement for
work and life

LUNAR®

Everything about money changes

We believe the power of money belongs to everyone, and we give consumers and businesses all the power they need to bank, pay and invest.

The future of money is embedded, web3, in the metaverse and whenever you need it.

You need interfaces that connect you with everything money to enter the next level of payments and banking.

That's what we're building: Money engagement for work and life. All you ever need in one place, to power the future of your money.

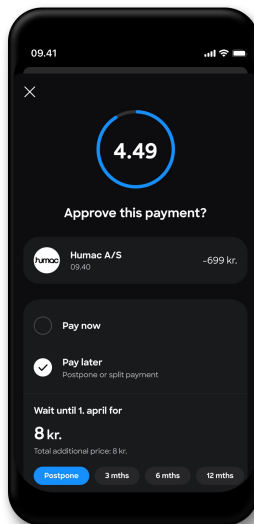# Lunar has all the power you need, in one place

BANK	PAY	INVEST	LEND
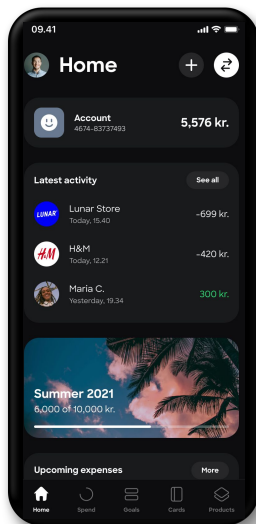
Cards
Accounts
Deposits

Card payments
Mobile payments
Lunar Checkout
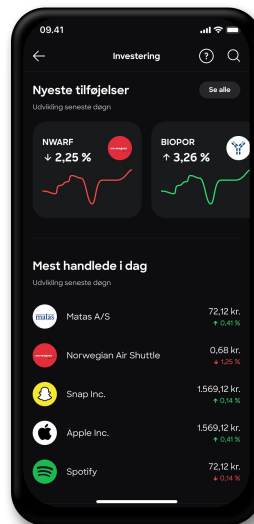
Stock trading
Fractionals*
Crypto
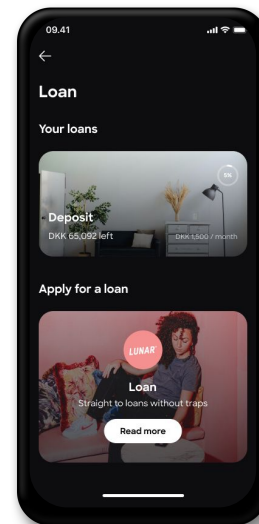
BNPL
Unsecured loans
Embedded finance

Lunar is the money engagement platform for work and life that gives consumers and businesses the power they deserve

THE PAST

Building personal finance management tools and banking infrastructure from scratch for consumers and businesses

THE PRESENT

Adding paytech and building a two-sided marketplace in the Nordics

THE FUTURE

All-in-one engagement platform for money.

Bridging consumers, entrepreneurs and merchants in a new way.

Future of Lunar Infrastructure

LUNAR®

European banking license and modular tech platform allows Lunar to control everything money

DEEP REGULATORY INTEGRATION

✓ EU Banking License
✓ Clearing Access in DK
✓ Infrastructure Integration in NO & SE (2022)
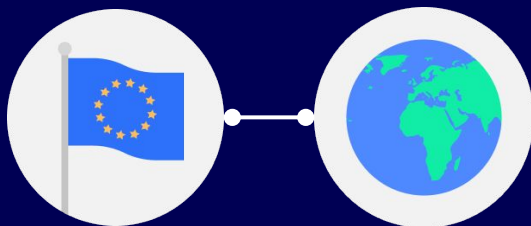
UNPARALLELED FLEXIBILITY

aws   Google Cloud   Azure

FRICTIONLESS FINANCE

Thought Machine   nets   SAXO BANK

MODERN TECHNOLOGY

• Flexibility • Governance • Traceability • Security
• API-first • Unified data • Automation

Lunar has an ambition to become a true Nordic challenger
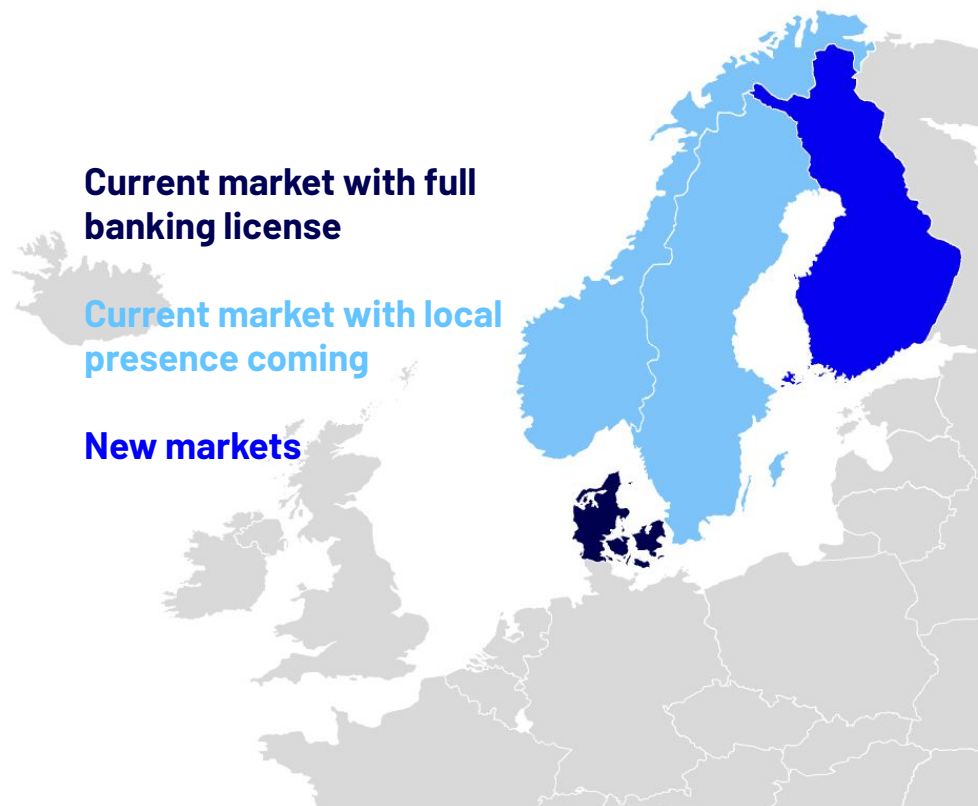
Current market with full banking license

Current market with local presence coming

New markets

We are rebuilding our infrastructure for scale across the Nordics

In order for Lunar to scale efficiently, we are building **one platform** across the Nordics, enabling us to:

- Offer local accounts and payment solutions for customers in the Nordics

- Launch and manage products across any market with unseen flexibility and speed to market

- Automate procedures, customer notifications etc. to an unseen degree

- Enter new markets and gain millions of customers across countries without need for additional partners, linear infrastructure cost and resources for development and maintenance

Lunar technology platform drives focus on customer innovation and scalability

Seamless access to a world of financial and lifestyle services

- Astralis
- Benefits
- Billy
- Business
- Business Loan
- Charity
- Dinero
- Crypto
- e-conomic
- Insurance
- Invest
- Loans
- Linked Accounts
- Payment Service
- Personal
- Pro
- Premium
- Subscriptions

Meeting the rapidly evolving needs of private and business users

LUNAR ®
Technology

Core infrastructure capabilities built by internal services and integrations with select partners to build best in class banking and payment services

- AML/Fraud
- Data Analytics
- Accounts
- Lending
- Cards
- Payments
- Treasury
- Accounting

Zero user friction experience focusing on a truly instant 24/7 banking experience

Modern Technology to drive
NEXT GENERATION FINANCIAL SERVICES

| Observability Traceability Authentication Compliance | Event and domain driven architecture to drive decoupling | Unified data platform - accessibility and governance | API first design | Developer experience Automation Quality Assurance Security |

Multi-cloud platform to drive flexibility and best capability for the job

aws · Azure · Google Cloud

Future Core System of Lunar

Lunar Core

General Ledger

Treasury Management

Reporting

Customers

AML & Fraud monitoring

Card Processing

Data Refinement & Exposure

Credit Scoring

Product Management

Payment Processing

Card Processor

Payment Orchestrator

Vault

Accounts

Loans

Smart Contracts

Workflows

Account Product Management
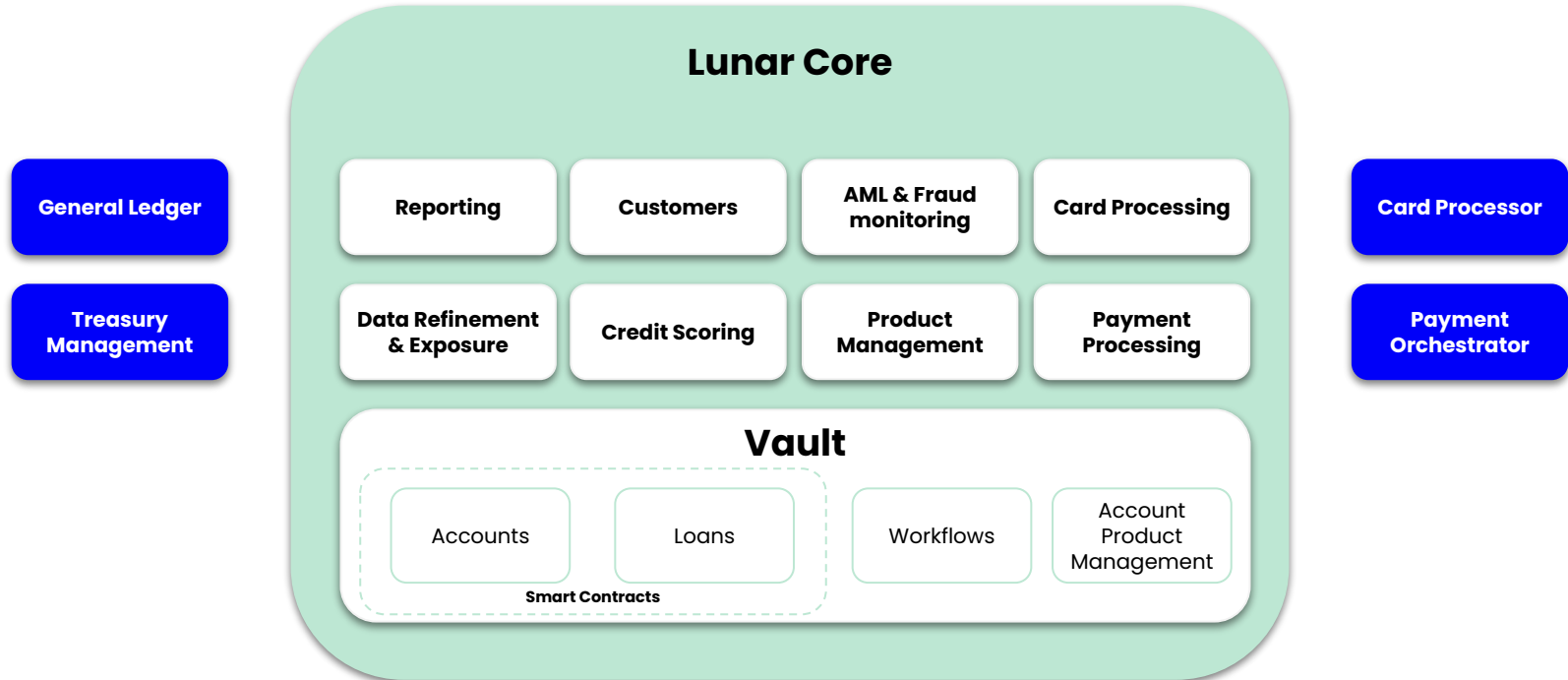
Thought Machine

Thought Machine x LUNAR®

Culture is our core

Coherent team driven by a single mission

- Thought Machine's culture has been built from the ground up to create a highly motivated, happy and efficient organisation
- We focus relentlessly on product excellence
- Product development is delivered entirely in-house
- Offer local accounts and payment solutions for customers in the Nordics

Engineering principles

- Focus on product quality
- Single platform for every bank
- Agile, Continuous Deployment, mono-repo
- Cloud-native team and architecture

Core principles

- Excellence in every role
- Competitive hiring
- Transparency

The future of core banking: at a glance

Our mission

Thought Machine builds the Vault platform, the foundation layer of modern banking.

Our technology runs the world's banks according to the best software practices of the modern age, ridding them of the problems generated by running on legacy infrastructure.

Our challenge

Legacy IT is restricting banks from innovating and delivering customers the products and services they want.

Thought Machine was founded to solve this issue, and bring banking into the 21st century with the latest engineering principles at its core.

Our solution

Our core banking platform, Vault Core, gives our clients full control to do, and build, anything they want.

We designed the system from scratch to give our clients total choice, flexibility and power.
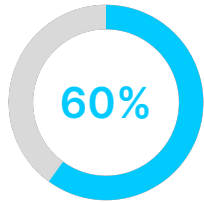
Our clients

The best banks in the world trust and use our technology. We have a global client list, from Tier 1 multinationals, to smaller regional banks and fintech companies around the world. Clients include JPMorgan Chase, Lloyds Banking Group, Standard Chartered, and Intesa Sanpaolo.

Thought Machine at a glance

Founded
2014

Employees
500+

60%

Strong **engineering first** culture

40%
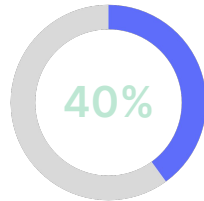
Experienced **Banking** & **Fintech** professionals

Canada
Sweden
UK
Denmark
London
Poland
Hungary
France
Italy
New York
US
Dubai
India
Hong Kong
Malaysia
Singapore
Indonesia
South Africa
Sydney
Melbourne
New Zealand

● Office locations
● Client locations
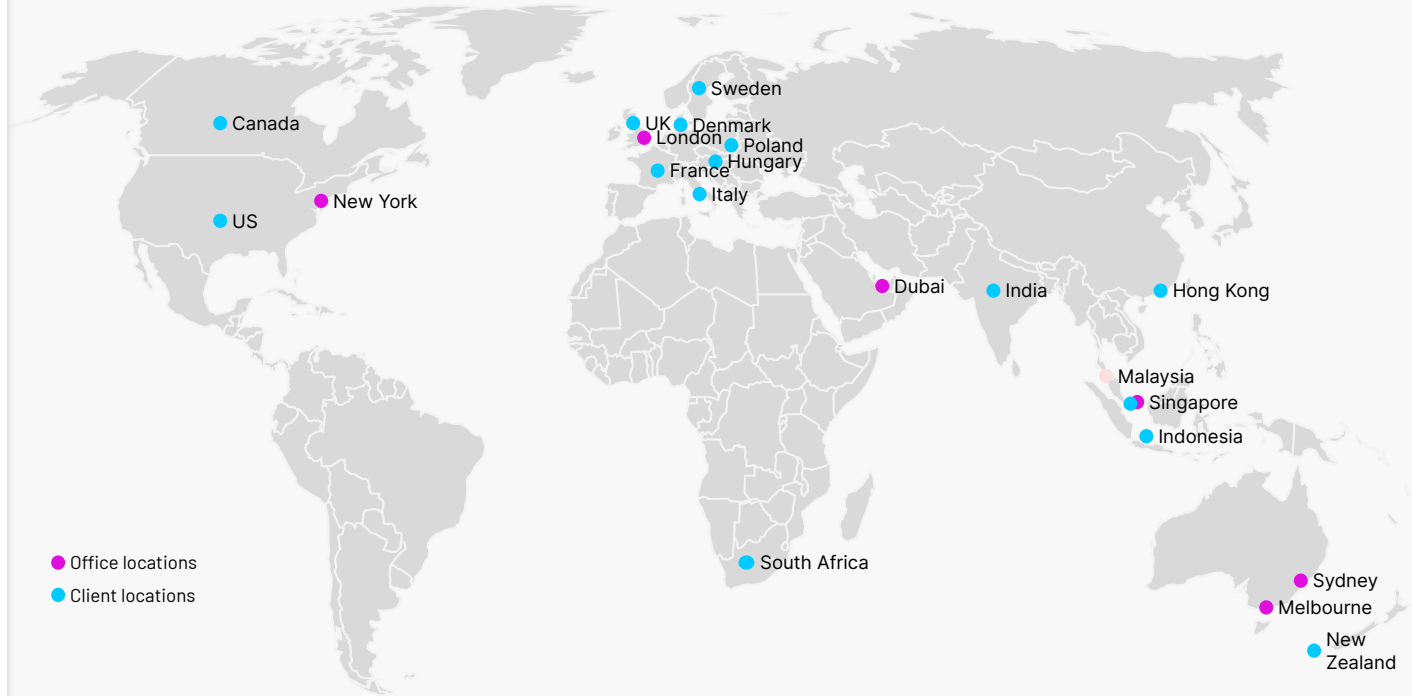
Global Clients | Constantly entering **new territories** | Growing number of **Locations**

Our clients in the public domain

Why Thought Machine?

Meeting the customers expectations - the customer comes first

Innovate
High levels of configurability allow banks to build, launch and manage any type of financial product.

Single core
Vault Core's innovative design allows for unparalleled product flexibility and personalisation, while providing clients with a single common platform.

Universal
Vault Core can run any type and size of bank on a single platform. It is cloud native and agnostic to support any deployment type by a bank, on any cloud provider.

Real time
Vault Core operates in real time, with no batch processing. Its Ledger is always available and accessible, and the rich data is streamed out via our Streaming API.

API first
All functionality is exposed via our APIs. The platform's synchronous and asynchronous APIs opens up other strategic possibilities.

"We looked at the market, looked at our internal capabilities and came to the conclusion that working with Thought Machine was the best path forward for us."

Rohan Amin, Chief Product Officer, JPMorgan Chase

Enabling flexible product design and creation

20+ years

Account	Lending	Deposits
Customer	Customer	Customer
Accounting	Accounting	Accounting
Charge	Charge	Charge
Limit	Limit	
Interest	Interest	Interest
Settlement	Settlement	Settlement
	Term amount	Term amount
Payoff	Payoff	
Etc.	Etc.	Etc.

Siloed Product design

- Products sit in siloed systems
- Duplication of common function
- Lack of agility, expensive architecture

Current industry approach

Account	Lending	Deposits
Customer		
Accounting		
Charge		
Limit		
Interest		
Settlement		
	Term amount	
Payoff		
Etc.		

Reusability

- Closed Box products
- Externalised common functions
- Inflexible products, vendor dependency

Our approach

Smart Contracts

- Current account
- Savings account
- Personal loan
- Mortgage
- Credit card
- Mobile wallet
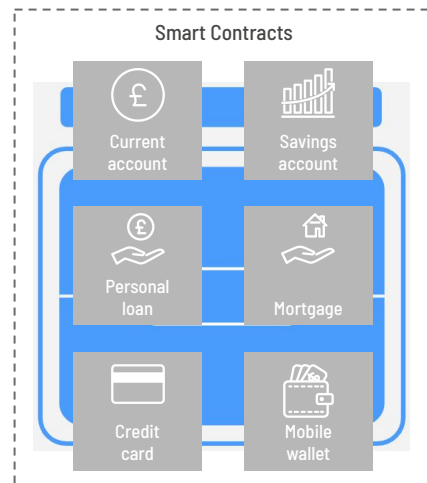
Total flexibility

- Open Box products
- Enables product differentiation
- Agility and less cost in delivering products

Smart Contracts

Allows financial institutions to own the creation of new products or update existing ones

Deployed on a single platform	All products run on a single platform – no more siloed data and real time view of banks position. **Enables standardisation and agility.**
Product as code	Subset of Python allowing for quick product creation, versioning, testing and deploying. **No limit to the number or sophistication of each product.**
Configurable through parameters	Parameterisation allowing for global, template and instance level. **Change product behaviour without updating contract code.**
Standardised contract interface	Kernel calls Smart Contract specific logic through hooks for transactional events and lifecycle events. **Single standardised API.**
Agile, on-demand product development	Launch products on demand and decide migration strategy. **No disruption when deploying contracts.**

What it means to be cloud native

Cloud native and in the cloud are entirely different concepts. The Vault platform empowers banks to harness truly cloud-native benefits.

Being 'in the cloud'

- **Lift and shift** approach – transporting dated applications to the cloud with limited customisation capabilities
- Application was originally built for deployment on a **traditional data centre**
- **Static** environment
- **Monolithic** application design
- Unable to keep up-to-date with the latest updates and advanced features – **no real-time update**

Being truly 'cloud native'

- System is fully hosted and managed **in the cloud: end-to-end**
- **Microservice architecture**: monolith systems cannot provide granular access to components
- **APIs**: external applications and systems can easily connect through exposed APIs
- **Reduced cost through Kubernetes orchestration** manages and secures the application regardless of the infrastructure that supports it
- **High availability**: runs in multiple data centres concurrently, with no downtime

Modern technology for modern banking

Cloud native

Cost-efficient, scalable, zero downtime, high availability. A single global platform – with no need for custom installations.

- Containerised microservices
- Kubernetes orchestration
- All functionality exposed as APIs
- Open-source technologies
- Infrastructure-as-code

- Elastically scalable and performant
- Self-healing and highly available
- Cloud agnostic
- Agile deployments

Hyper configurable

- Universal Product Engine
- Smart contracts
- Product-agnostic core

Real-time core

- Centralised, "single source of truth" ledgers
- Real-time data streaming and analytics
- 24/7 transaction processing

Continuous deployment

Constant evolution of the product, fast fixes and upgrades.

Microservices-based architecture

Smaller services allow quicker development and unblock dependencies. APIs provide clear distinction and definition of what components do. Open architecture allows for other applications to be easily plugged in.

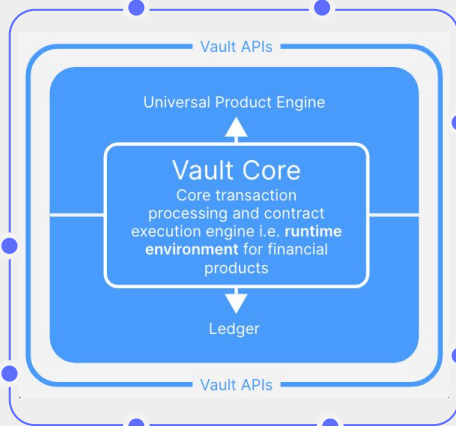## Engineering-led product design

Re-engineered, optimal architecture for the bank of tomorrow, general solutions to problems, future proof.

Clients deployed through instances of the same platform

Constant, seamless upgrades in which many clients share the cost of a single, common platform.

Agile project management

The platform is continuously upgraded and always aligned with customer requirements. Fast try-feedback-fix cycle.

Vault APIs

Universal Product Engine

Vault Core
Core transaction processing and contract execution engine i.e. **runtime environment** for financial products

Ledger

Vault APIs

Thought Machine's place in building the bank of the future

Thought Machine has built the Vault platform - **the foundation layer of modern banking** - to enable banks to remain competitive and flourish. It gives banks full control to do anything, from launching innovative products to sustainably maintaining legacy products.
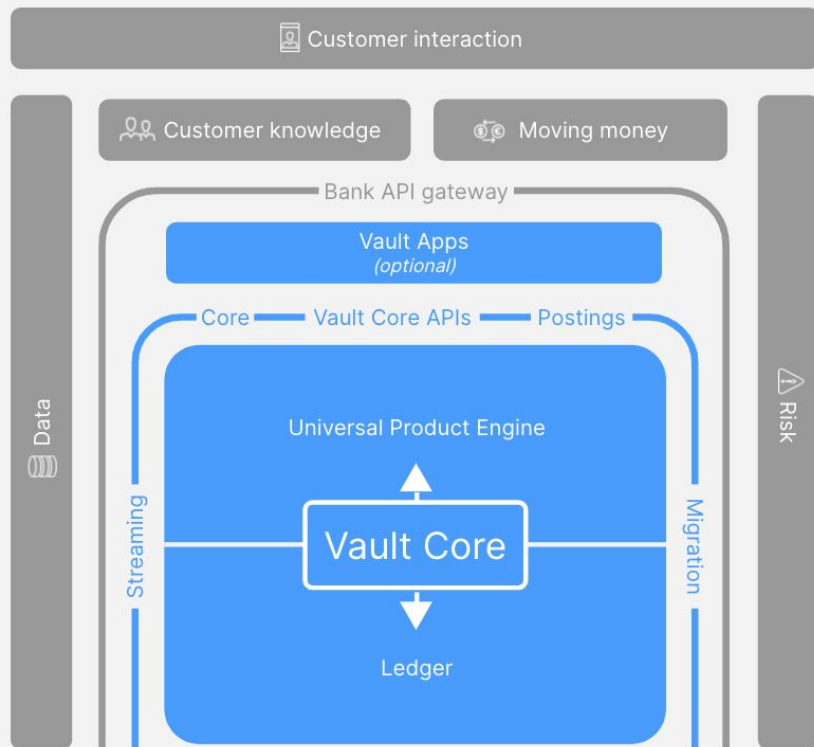
The Vault platform: modern core banking in the cloud

How is the Vault platform unique?

- Build and support any financial product, from complex legacy products to new innovative products that can be rapidly iterated to meet customers' ever-changing needs

- Run any type and size of bank on a single platform

- Cloud native and agnostic to support any deployment type by a bank, on any cloud provider

- API-enabled and real-time

- Highest level of performance, reliability and operational resilience

- Low cost enabling a bank to achieve a low cost-to-income ratio compared to their peers

The Vault platform can support clients to achieve any ambition

We have specialist tools and support to expertly deliver a full spectrum of deployments from digital greenfield to coexistence and complex migrations in the timelines that meet a bank's ambitions

Clients can choose a deployment option to suit their requirements

Digital greenfield

New technology stack, new customer propositions and new customers

Coexistence

Integrations into the existing technology stack, new customer propositions and new and existing customers

Migration

Migrating back book of existing customers

Deployments are accelerated by our **library of vendor integrations** and **SDK** which enables partners and clients to **easily add new integrations** with existing bank systems and new vendors

All supported by our **expert specialist client services team** plus:

Documentation and SDK to enable self-service

Network of delivery partners

Training to upskill clients and partners

How to work with Thought Machine to configure Vault Core

Vault Core is a highly configurable core banking platform, enabling our clients to build exactly the proposition they want. There are three ways of working when configuring Vault Core:

Bank driven

Our clients can use our library of banking products, or write smart contracts through Vault Core's Product SDK. We provide an extensive training programme and Documentation Hub, to facilitate product creation.

Thought Machine client services

Thought Machine has a dedicated client services team to write smart contracts on a client's behalf. The team includes dedicated client delivery managers, client architects, business analysts, technical analysts and service managers.

Partnership driven

You can work with partners of your choice to write the smart contracts and other configuration content. A selection of the partners we currently work with are highlighted on the following slide.

Partner network

Consultancies
Helping banks map a path to a future state banking system.

Delivery partners
Banks can use delivery partners to help build smart contracts and connect bank or third party integrations.

Technology vendors
Complement Vault Core and complete a bank.

Cloud providers
Help banks modernise their tech infrastructure and accelerate digital transformation.

LUNAR®