Emerging Technologies Shaping the Future of Banking

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EY Parthenon

Speaker

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Emerging Technologies and Digital Ecosystems Strategy

Amsterdam

Expertise

- CBDC, DeFi, Crypto, Digital Assets
- Capitalism 2.0
- Emerging Tech strategy
  - Blockchain
  - AI, ML
  - Quantum
  - IoT
- Digital Ecosystems strategy
  - Industry consortia
  - Partnership models
  - Value creation and distribution
  - Ecosystem governance
- Uncertainty Advantage: trend and scenario analysis
- Value Creation strategy

LinkedIn

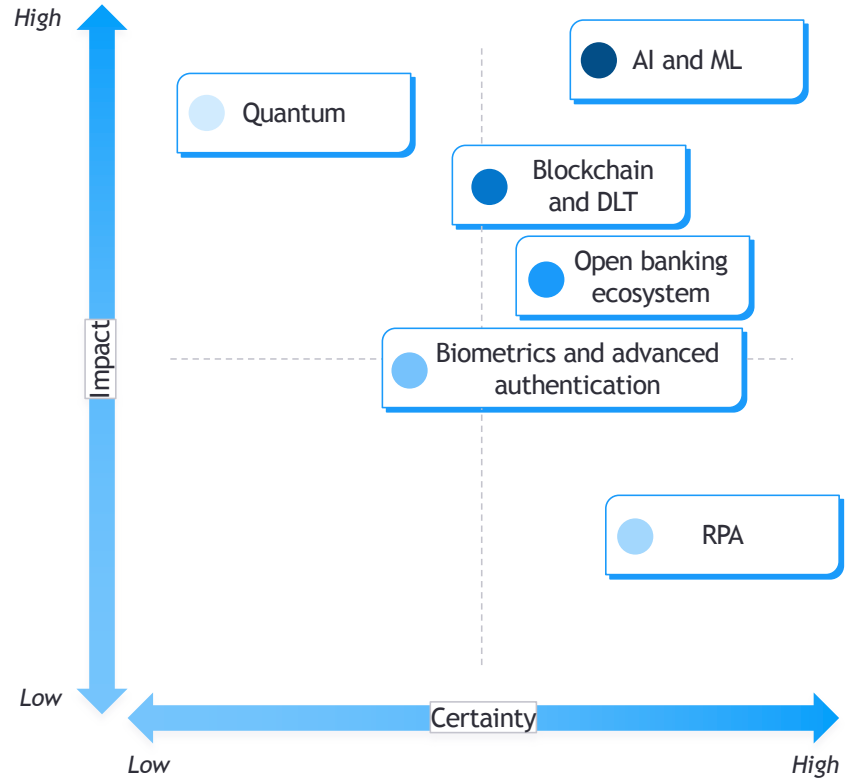
Igor Mikhalev

Partner | Head of Emerging Technologies

Overview of key Emerging Technologies

Six key emerging technologies will shape the Future of Banking in the upcoming 5 to 10 years

Technologies impacting finance



Technology	The impact on Banking
(Gen)AI and ML	▸ New business models with increased efficiency leveraging personalization and task automation
Blockchain and DLT	▸ Decentralized business models & competition, customer ownership & lower verification costs
Open banking ecosystem	▸ New partnership ecosystems, collaboration between institutions and third-party providers
Biometrics & advanced authentication	▸ Improved UX and security enable higher customer acquisition at lower cost
RPA	▸ Adoption of automation as a competitive advantage to increase agility and reduce OpEx
Quantum	▸ Leap in computational power for complex calculations in e.g. portfolio optimization and risk assessment

Source: EY-Parthenon analysis

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Today

Overview of key emerging technologies

1. (Gen)AI and ML
2. Blockchain and DLT
3. Open banking APIs
4. Biometrics and advanced authentication
5. RPA
6. Quantum

(Gen)AI and ML

While generative-AI and Large Language Models are a step forward in the evolution of AI, there are some limitations to be aware of prior to embarking on adoption

LLM[1] capabilities

What LLMs can do?

1. Sort, categorize and analyze
2. Generate and edit
3. Interpret and summarize
4. Generate code & UX elements
5. Personalization and profiling
6. Critical thinking and reasoning
7. Context and common sense

Most recent advancements

What LLMs cannot do (yet)?

Estimated timeline to see developments

	Beta launched	Matter of months	Don't know/can't say
▸ Privacy & security		Regulation dependent	
▸ Legal or vetted professional services		Regulation dependent	
▸ Emotional understanding			●
▸ Original thought or creative content			●
▸ Physical actions or observations		●	
▸ Individuality and personal opinions			●
▸ Ethical decision making			●

1.Large language model.
Source: EY-Parthenon analysis

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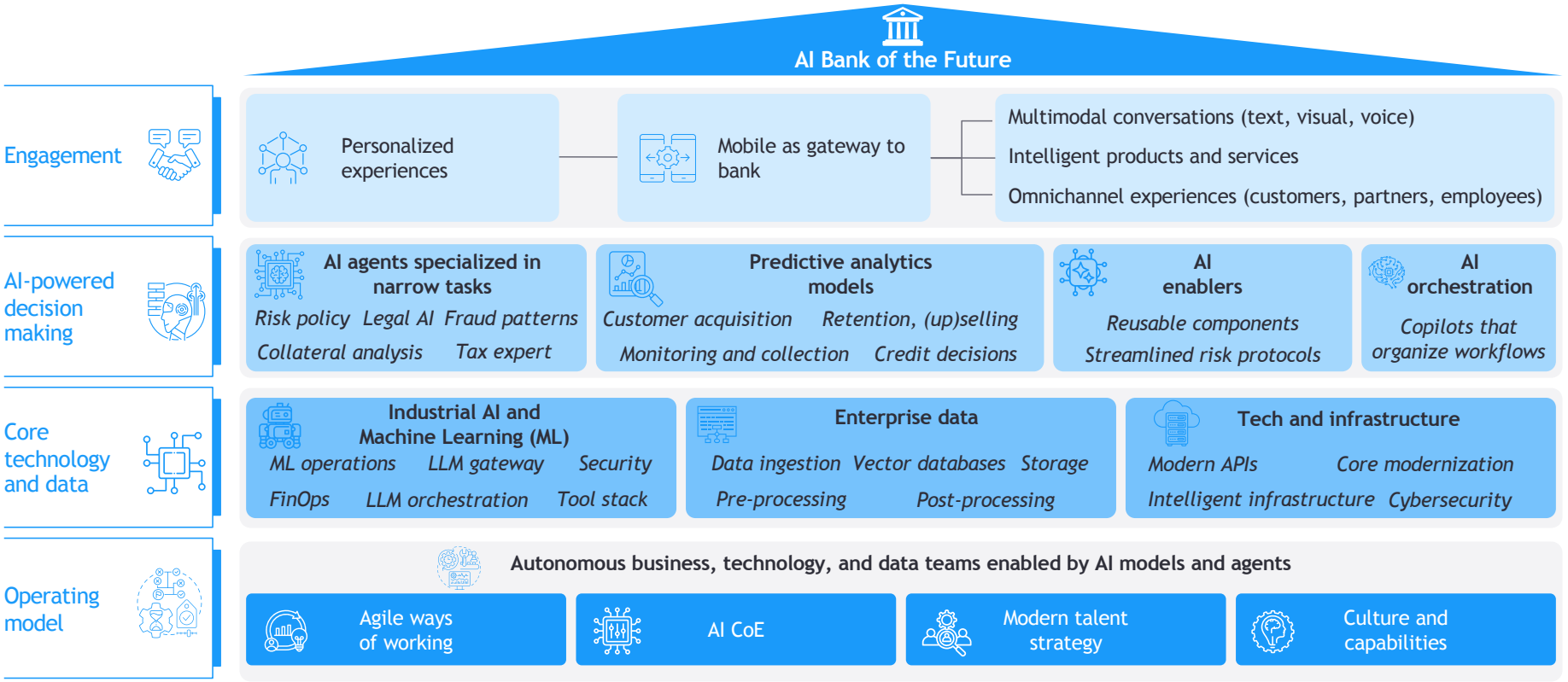
(Gen)AI and ML

To drive sustainable value, banks need to put AI first and incrementally revamp the entire technology stack

Bank of the future



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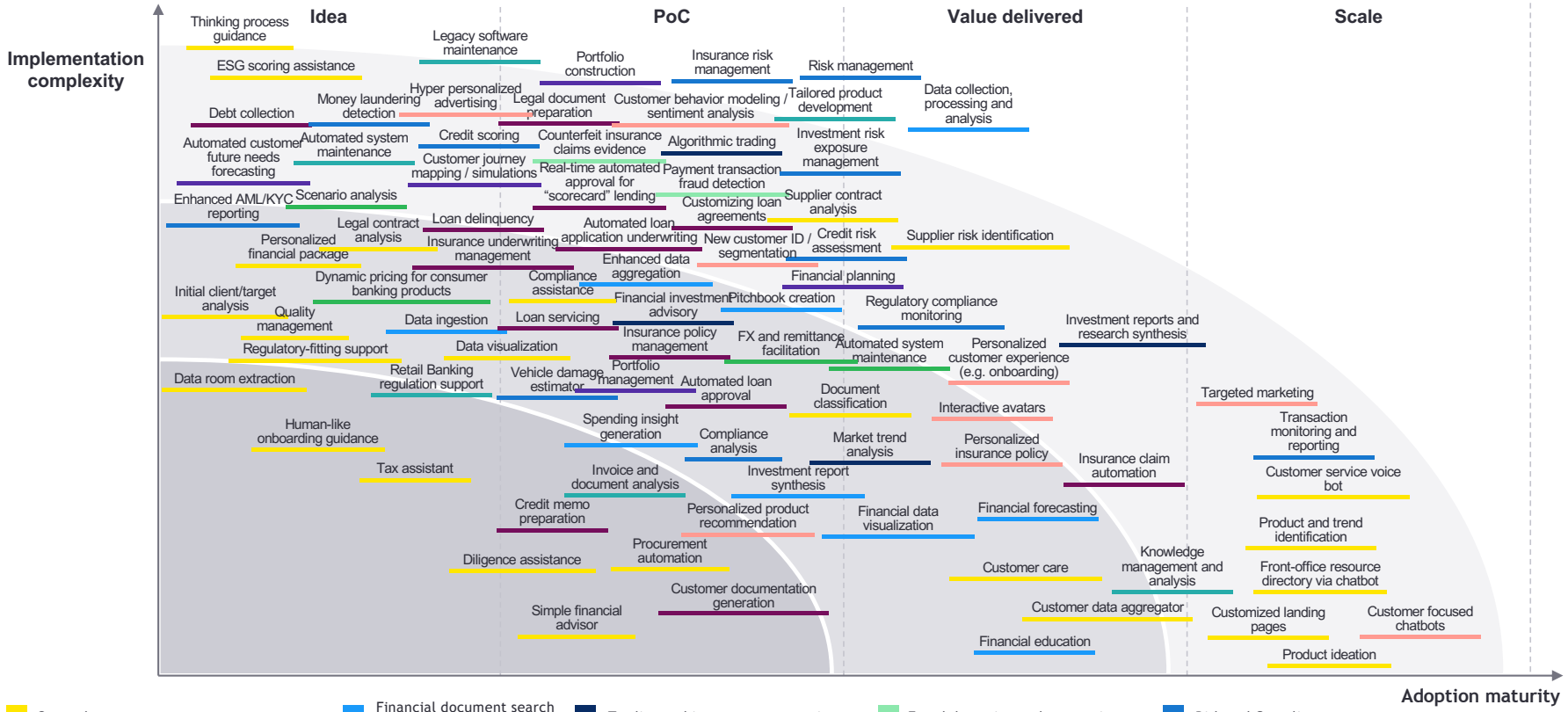
(Gen)AI and ML

AI disrupts established operating models and promises new business model opportunities; we created an overview of the common use-cases in the Banking industry

GenAI Banking use-cases



Source: EY-Parthenon analysis

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Decentralized Value Exchange layer makes true ownership & P2P value exchange possible via the internet

Internet Value Exchange

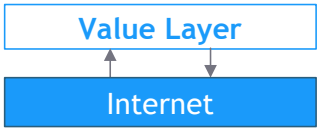
Value exchange was a missing layer on the Internet

Sending money, or stocks, should be like sending email

But problem was that Internet protocol was stateless

If this were possible, it would enable true ownership & P2P transfers of anything of value

What we need are global ledgers to keep track of who owns what



Billions of users directly connected to and through the Internet of Value

Characteristics would mirror the principles of the Internet

1. Decentralized
2. Resilient
3. Open to all
4. You can hold & transfer what you own

… but technology was not available to do this, resulting in many fragmented private ledgers

Source: EY-Parthenon analysis

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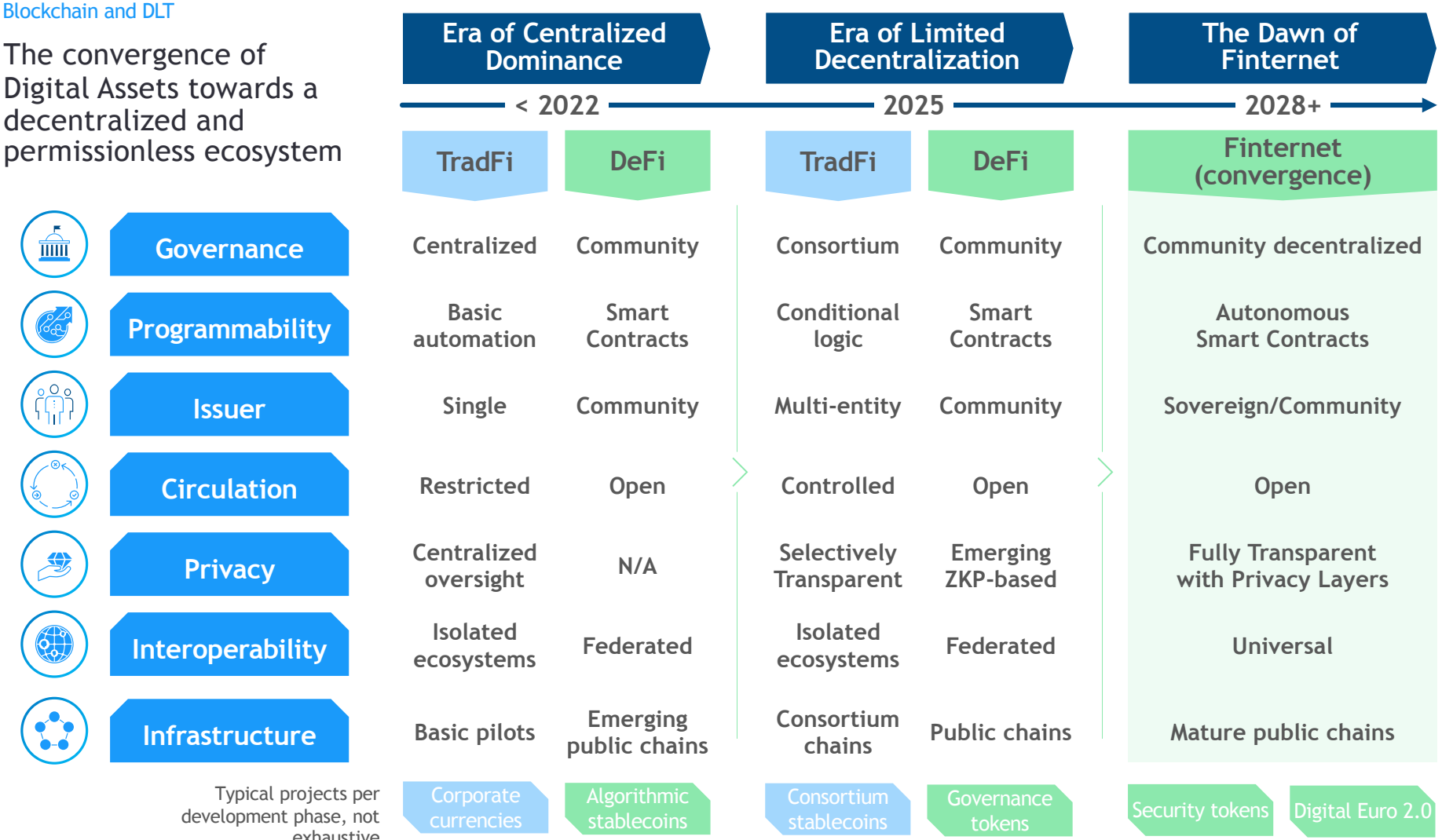
The convergence of Digital Assets towards a decentralized and permissionless ecosystem



Source: EY-Parthenon analysis

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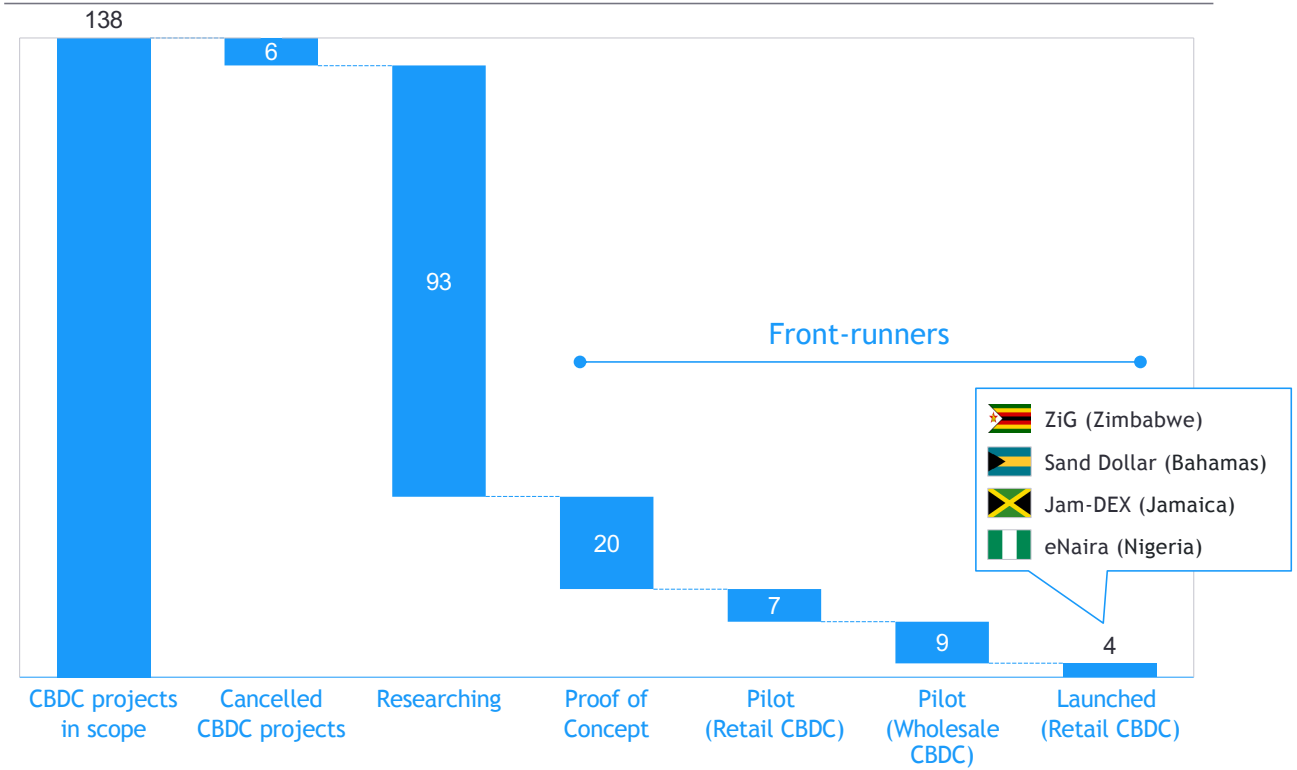
Multiple banks are experimenting with CBDCs, however, there are virtually no launched projects at scale in developed countries

CBDC types

- Retail — >90 projects
- Wholesale — >30 projects
- Other — 5 projects

CBDC projects in the current phases of the development[1]



1.CBDCTracker.org data might differ slightly from the data in the chart, updates take place monthly and follow official central bank announcements.
Source: CBDCTracker.org; EY-Parthenon analysis

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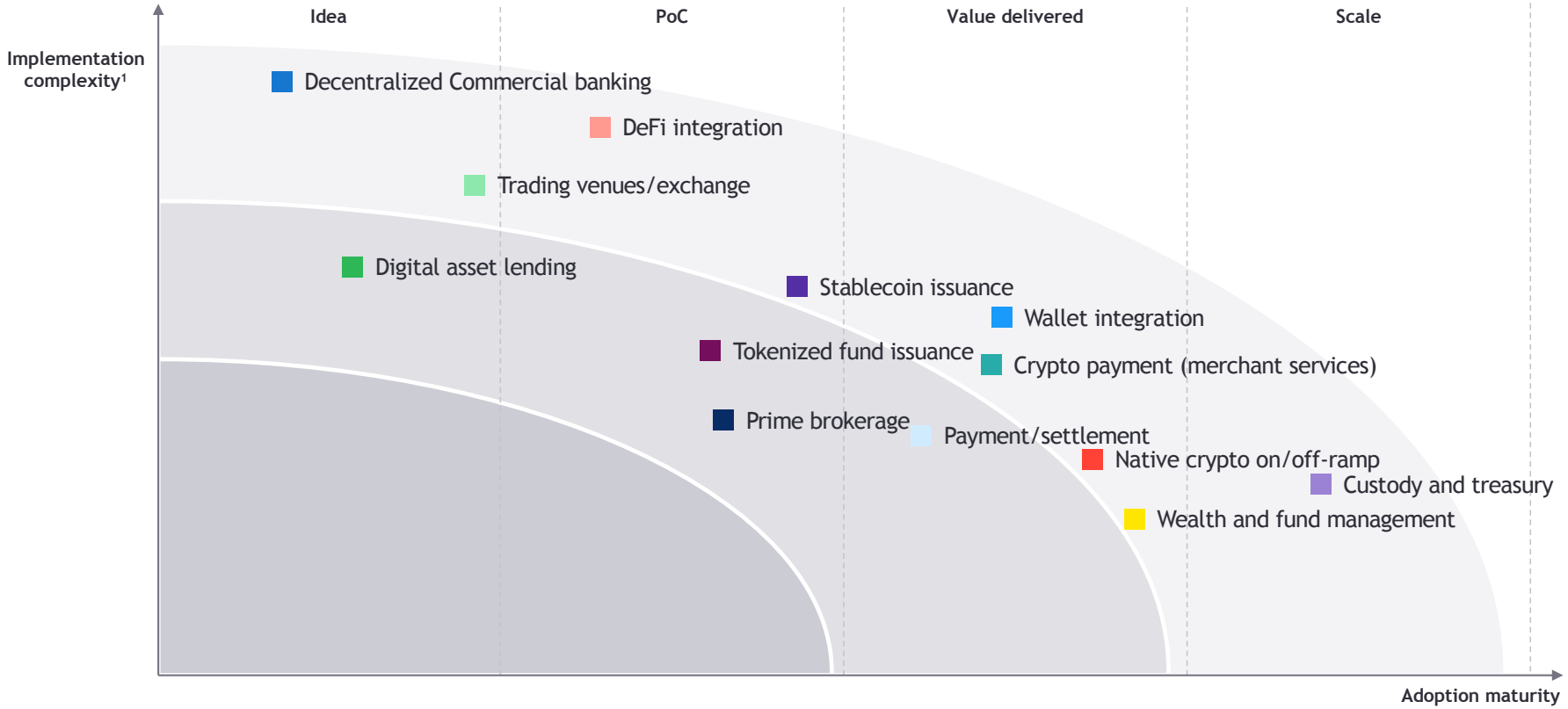
Blockchain disrupts established operating models and promises new business model opportunities; we created an overview of the common use-cases in the Banking

Blockchain Banking use-cases



1. Includes technical, compliance and operational complexity.
Source: EY-Parthenon analysis

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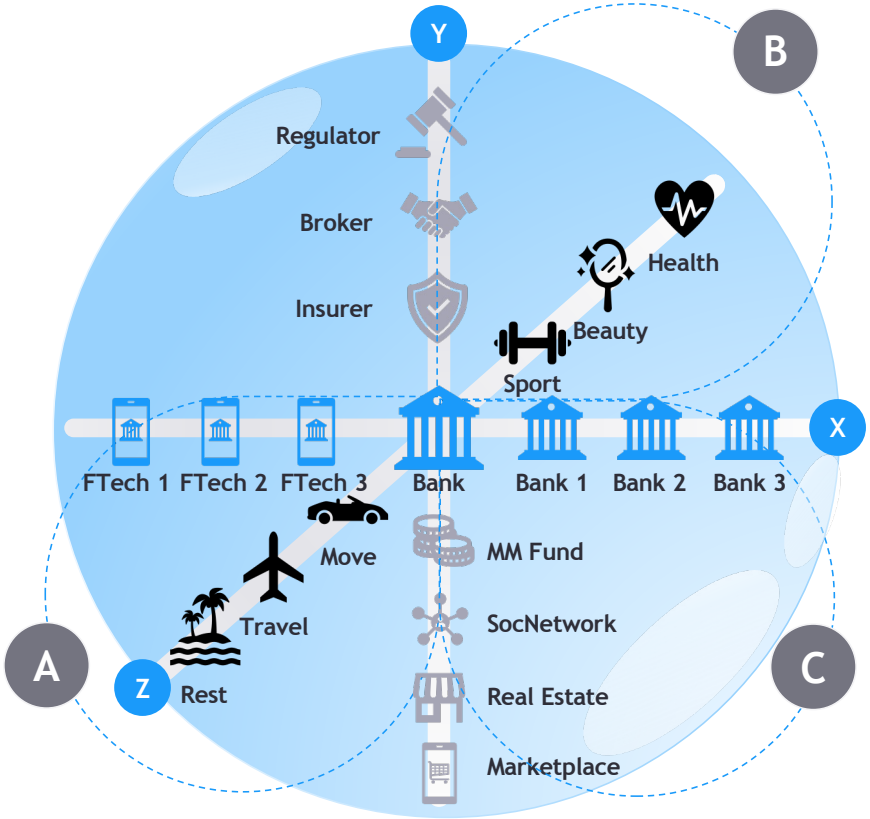
Open banking ecosystem

Ecosystem Play allows a unique strategy driven by the infinite number of possible combinations for a distinct and unique customer proposition

Digital Ecosystem in Banking



Strengthen your unique customer proposition by…

A **Partnering with FinTechs to create a "lifestyle-centered" ecosystem around travel and mobility**

- Offer Beyond-banking propositions for core customers
- Position your bank in line with FinTech-aligned for younger clients
- Extend B2B banking for service partners

B **Partnering with other FS providers to create a "Wellness-Flavoured" FinSupermarket for clients with active lifestyle**

- Cater to HNW-clients with active lifestyles
- Be the preferred bank for diverse financial needs needs

C **Partnering with other banks to compete with digitally-native FinTechs by offering financial services on a shared digital platform (Payments, Mortgage, BNPL)**

- Be the go-to bank for internet transactions
- Encourage more customer transactions
- Simplify KYC and customer data exchange

Source: EY-Parthenon analysis

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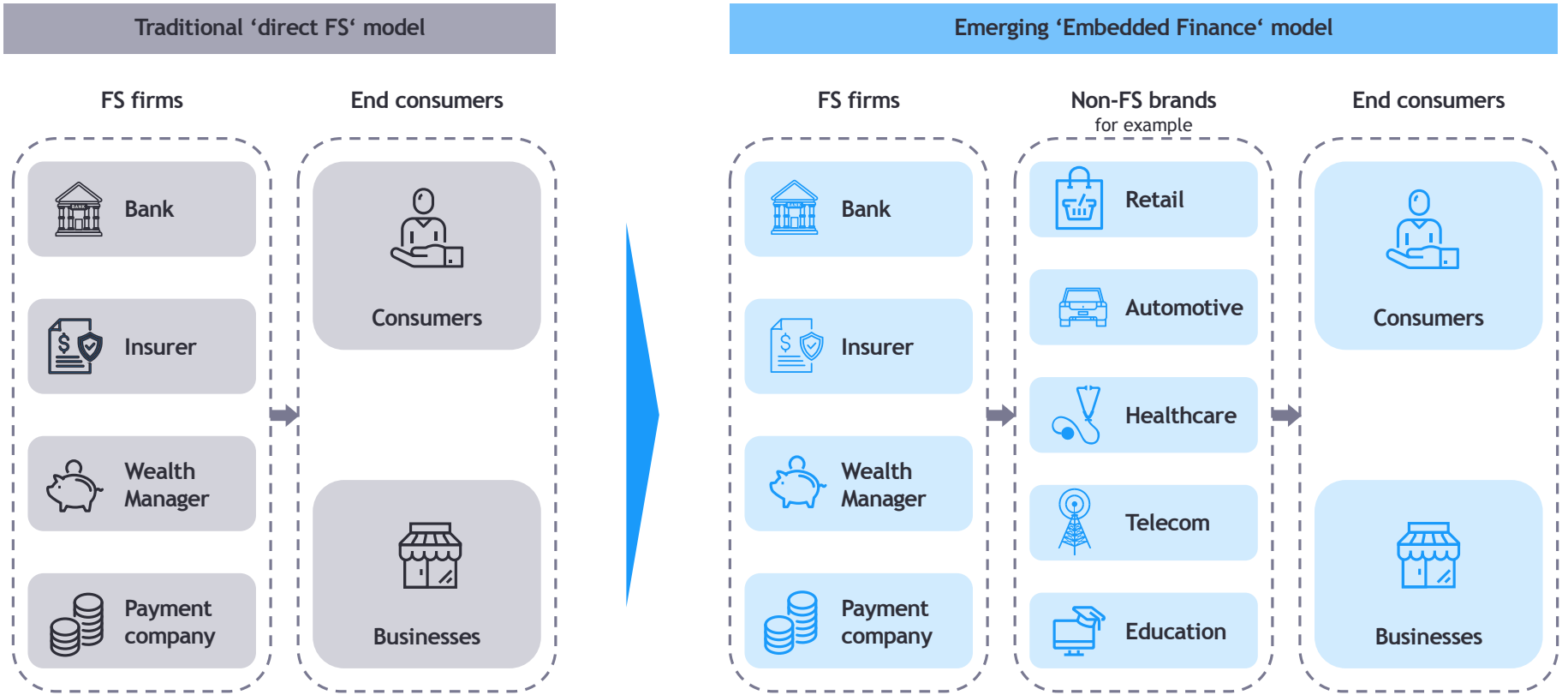
Open banking ecosystem

One of the main risks for financial institutions is the potential loss of the direct relationship with end consumers



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Biometrics and advanced authentication are reshaping the customer journey across the banking industry

Applications	Use cases	Selected benefit(s)	Maturity
Advanced biometrics *use of unique biological characteristics for verification purposes*	Identity checks; Identity Recognition; Client onboarding; ATMs; Theft identification; Phone interaction	65% of users feel more comfortable using biometrics to access bank data	*Next*
Facial Recognition Technology *facial features to enable secure customer authentication and prevent identity fraud*	KYC onboarding; ATMs; Insurance claims; Fraud recognition	Shorter wait time and shorter onboarding lead time	*Now*
Voice Recognition and Processing *ability of machines to identify, interpret, and respond to human speech*	Bank log-in; Fraud recognition; Two-factor authentication; Client verification	Reduce identity verification time from 1.5 minutes to less than 10 seconds	*Next*
Digital Identity and Access Management *ensures the right users have appropriate access to (technology) resources*	Regulatory compliance; Client onboarding; Governance; Client verification	Enhance productivity and reduce IT spend	*Now*

Source: EY-Parthenon analysis, Visa, Barclays

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RPA

Robotic process automation (RPA) allows banks to optimize operations and deliver exceptional customer experiences

Applications	Use cases	Selected benefit(s)	Maturity
Customer Onboarding & Service *automated data collection, validation, and integration across systems*	Onboarding processes; Data handling; Client onboarding; Customer transition; Service experience; Phone interaction	Improved customer satisfaction whilst freeing up human agents for more complex tasks	*Next*
Regulatory Compliance & Reporting *automated transaction monitoring, fraud detection, and report generation*	KYC onboarding; Report generation; Audit process; Fraud recognition	Accurate & timely report generation, whilst lowering non-compliance risk	*Next*
Loan & Mortgage Processing *automated document collection, credit checks, and eligibility assessments*	Customer application; Credit check & underwriting; Application review; AML checks	Reduce processing times for applications	*Now*
Credit Card Processing *automated form reviews, eligibility validations, and system updates*	Card issuance; Fraud detection; Application review; Delinquency identification	Reduce operational costs associated with processing	*Now*

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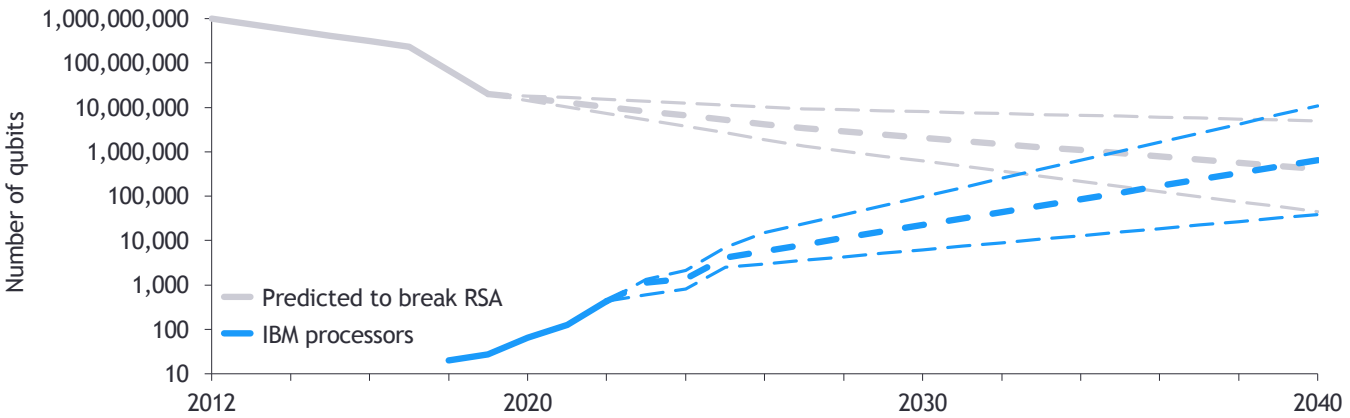
Currently identified opportunities enabled by quantum technology in banking are primarily found in portfolio optimization, market simulations, and risk assessments

Estimations on a quantum computer being able to break RSA

Estimated evolution of number of qubits in quantum computer and the necessary number of qubits to break RSA

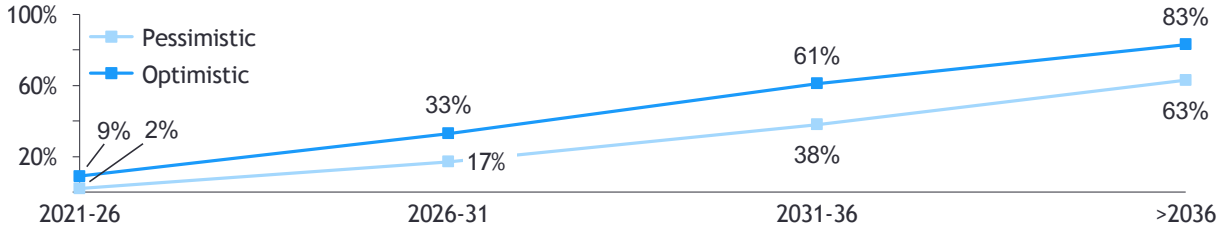


The predicted number of qubits required for a quantum computer to break RSA encryption in a reasonable timespan decreases over time

Quantum computers increase in number of qubits

At one point in the future **quantum advantage** is reached

Experts' estimations of time until RSA-2048 can be broken by a quantum computer within 24 hours



In 2021, most experts thought that between 2031-36 a QC is able to break RSA-2048 within 24 hours

Source: IBM; EY quantum readiness survey 2022; Global Risk Institute; EY-Parthenon analysis

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There are already many different use cases identified for the financial services industry; the challenge will be picking the right one for your organization

Use cases

#	Use cases	Quantum advantage driver: Speed	Capacity	Accuracy
1	Asset pricing	~	✓	~
2	Predicting volatility	✗	~	✓
3	Predicting the outcome of exotic options	✗	~	✓
4	Fraud detection	✗	✓	✓
5	Portfolio optimization	✗	✓	~
6	Hedge fund selection	✗	✓	✓
7	Algorithmic trading	✓	~	✗
8	Market making	✓	~	✗
9	Financial forecasting, accounting and auditing and risk assessment	✗	✓	✓

✓ This driver is a reason to explore a quantum solution

~ This driver is not the reason to explore a quantum solution but an advantage can be achieved

✗ This driver is not a reason to explore a quantum solution

Source: EY-Parthenon analysis

Thank you!

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