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Intelligent Transformation of the Financial Sector: Blockchain and AI

Prof. Soulla Louca

Director, Institute For the Future (IFF)

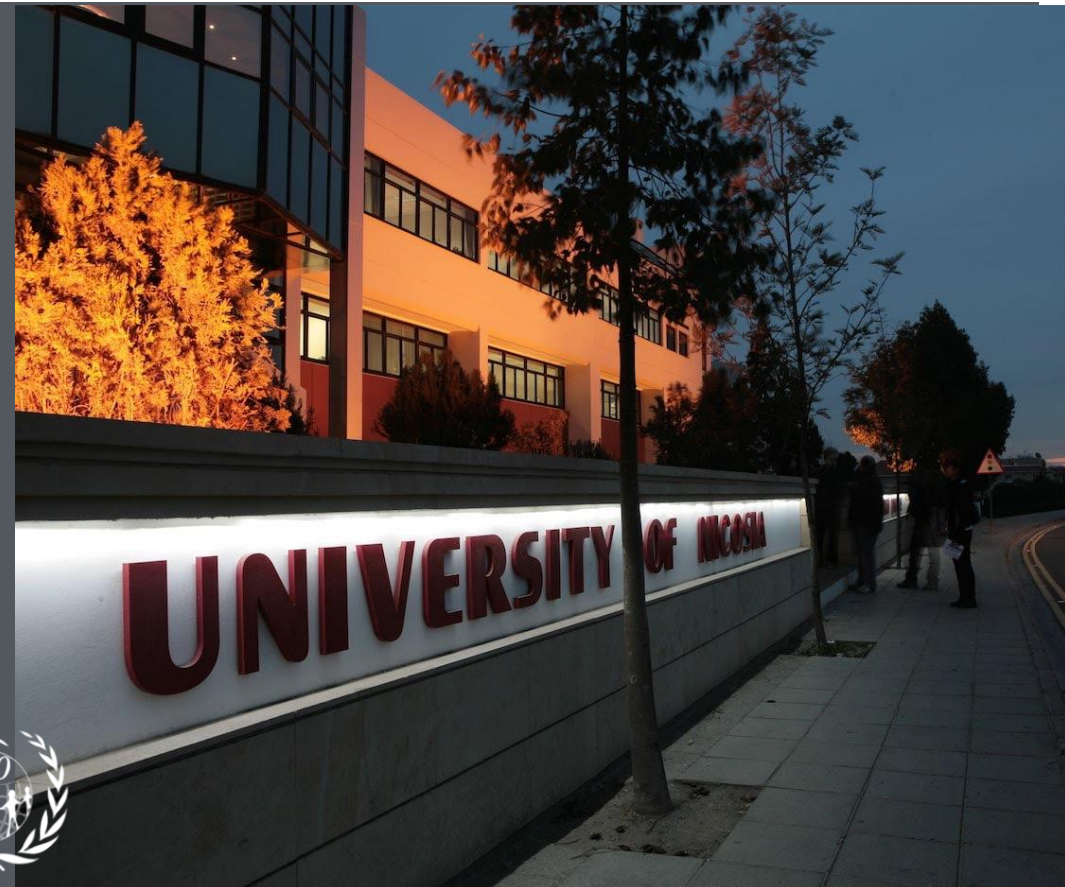**University of Nicosia**

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Who we are

University of Nicosia
Institute For the Future & Blockchain Initiative
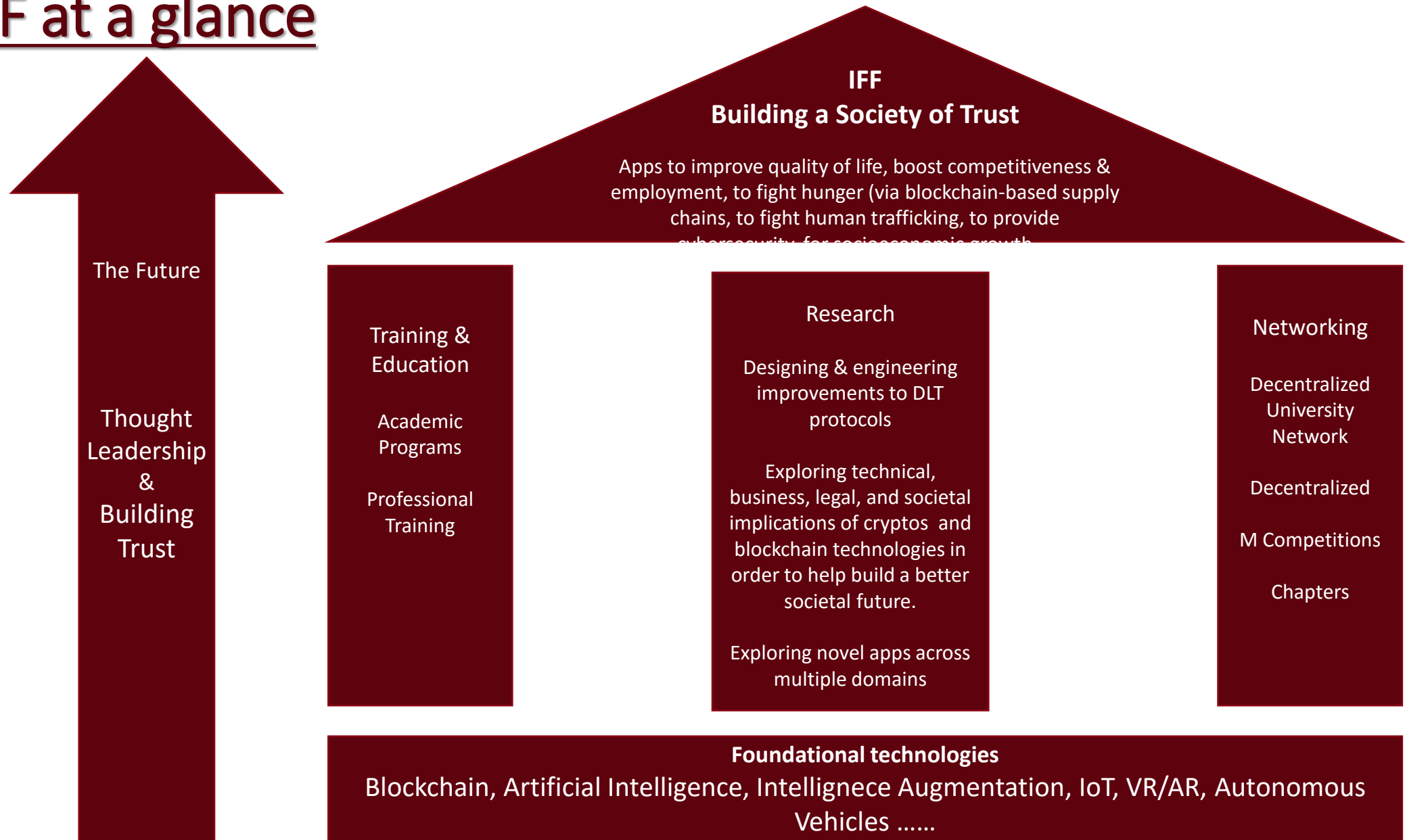**(IFF)**

University of Nicosia

excellence.in.education.

The **University of Nicosia** is the culmination of an ongoing journey which began over 30 years ago. Today, the University of Nicosia is the leading university in Cyprus - in line with our enduring motto: "Excellence in Education".
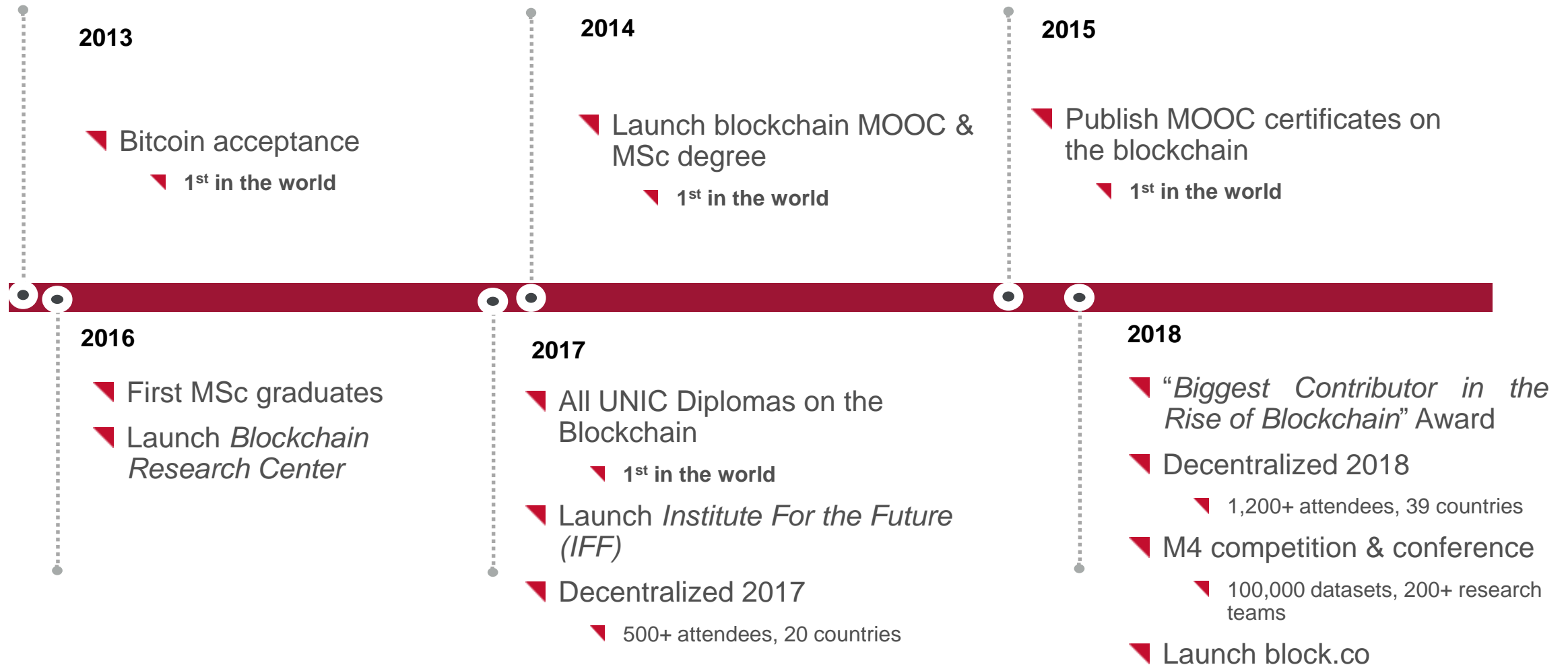
✓ **Unique Location**

Located in Nicosia, the capital of Cyprus

✓ **Multicultural Learning Environment**

Hosts students from all over the world, in a multicultural learning environment

✓ **Erasmus University Charter**

Erasmus University Charter and participant in the European Credit Transfer System (ECTS)

✓ **Global Education Centre**

At the cross-roads of three continents, the university has become a global education centre

✓ **Our Research**

Involved in European and local research projects as partner as well as coordinating institution

✓ **Community Involvement**

Involved in the community (e.g. environmental protection and fighting world hunger)

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IFF at a glance

The Future

Thought Leadership & Building Trust

IFF
Building a Society of Trust

Apps to improve quality of life, boost competitiveness & employment, to fight hunger (via blockchain-based supply chains, to fight human trafficking, to provide cybersecurity, for socioeconomic growth...

Training & Education

Academic Programs

Professional Training

Research

Designing & engineering improvements to DLT protocols

Exploring technical, business, legal, and societal implications of cryptos and blockchain technologies in order to help build a better societal future.

Exploring novel apps across multiple domains

Networking

Decentralized University Network

Decentralized

M Competitions

Chapters

Foundational technologies

Blockchain, Artificial Intelligence, Intellignece Augmentation, IoT, VR/AR, Autonomous Vehicles ......

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Activity timeline

2013
- Bitcoin acceptance
  - 1st in the world

2014
- Launch blockchain MOOC & MSc degree
  - 1st in the world

2015
- Publish MOOC certificates on the blockchain
  - 1st in the world

2016
- First MSc graduates
- Launch *Blockchain Research Center*

2017
- All UNIC Diplomas on the Blockchain
  - 1st in the world
- Launch *Institute For the Future (IFF)*
- Decentralized 2017
  - 500+ attendees, 20 countries

2018
- "*Biggest Contributor in the Rise of Blockchain*" Award
- Decentralized 2018
  - 1,200+ attendees, 39 countries
- M4 competition & conference
  - 100,000 datasets, 200+ research teams
- Launch block.co

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Our people: IFF Governing Board

Antonis Polemitis
UNIC CEO

Dimitris Drikakis
UNIC VP of
Global Partnerships

George Giaglis
IFF Director

Soulla Louca
IFF Director

Spyros Makridakis
IFF Director

Marinos Themistocleous
IFF Director

Our people: IFF Researchers & Staff

Dr Klitos Christodoulou   **Dr Elias Iosif**   **Dr Charis Savvides**   **Dr Ifigenia Georgiou**   **Dr Ioannis Katakis**   **Dr Konstantinos Karasavvas**   **Dr Ariana Polyviou**   **Jeff Bandman**

Andreas Vlachos   **Kypros Stefanou**   **Valentinos Theofilou**   **Irene Patrikios**   **Nick Assimenos**   **Sokratis Mina**   **Elena Kontemeniotis**   **Maria Charalambous**

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Our people: Visiting Scholars

Andreas Antonopoulos

Prof Nassim Nicholas Taleb

Stefan Loesch

Adam Hayes

Dr Theodosis Mourouzis

Athanasios Leontaris

Apostolos Kourtis

Yiannis Menelaou

Mark Toohey

Blockchain, AI & Fintech

Setting the Scene

The Dawn of the 4ᵗʰ Industrial Revolution

- **Historical intersection**
  - Tech Singularity
  - IoT, AI, DLT, …. a fusion of technologies lead the way
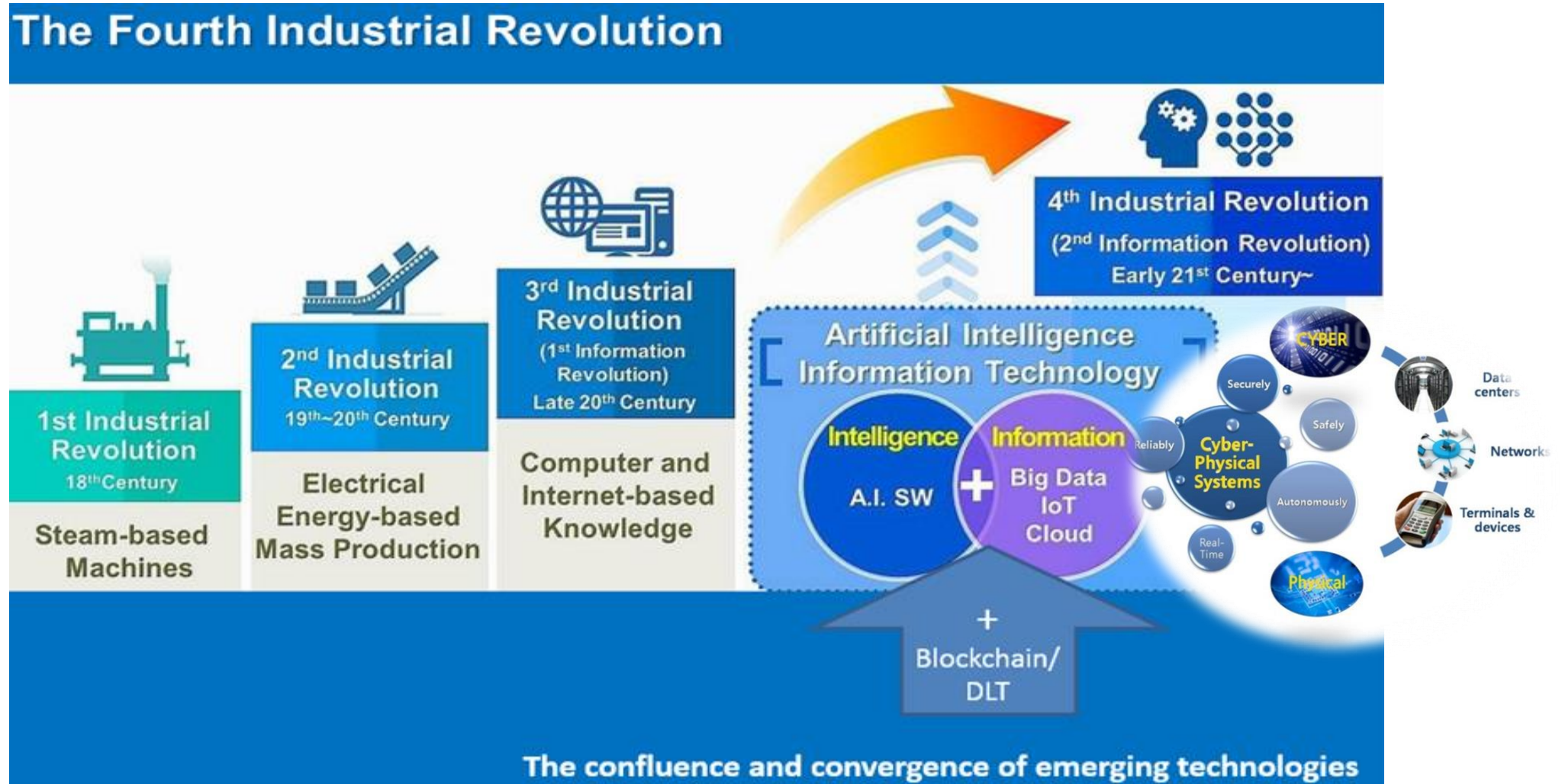 - Internet of Information ➜

  Internet of Value ➜ Internet of Trust
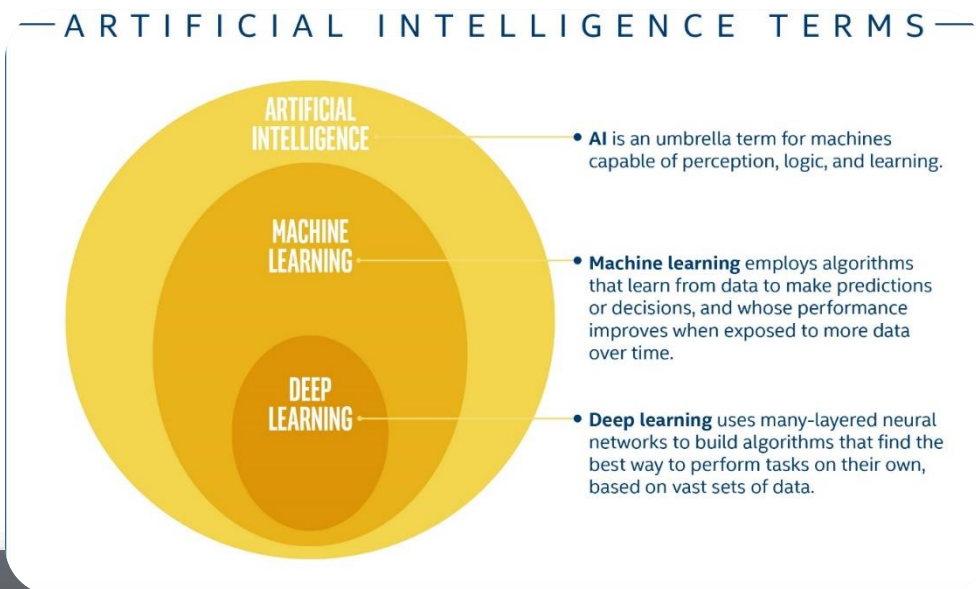
Economic growth & social disruption
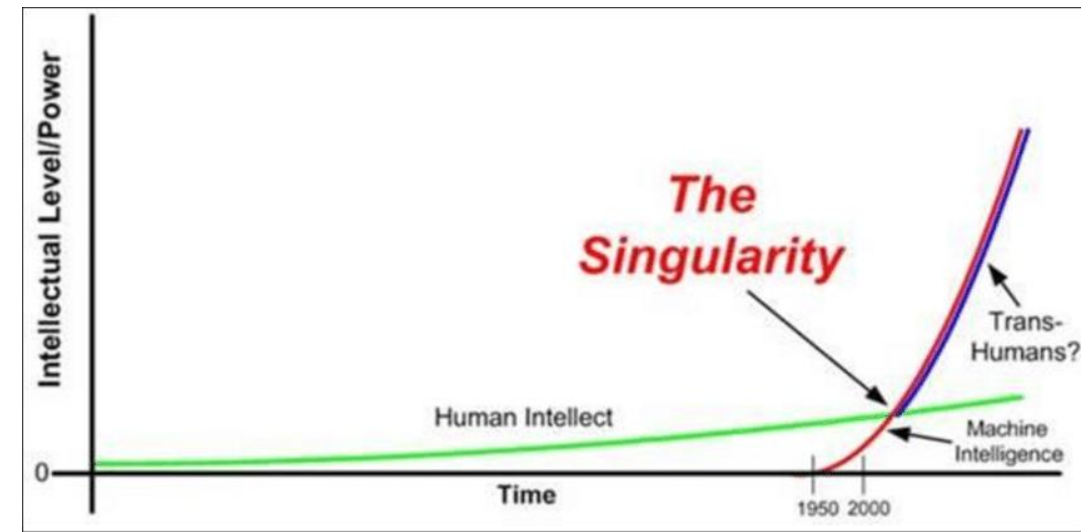
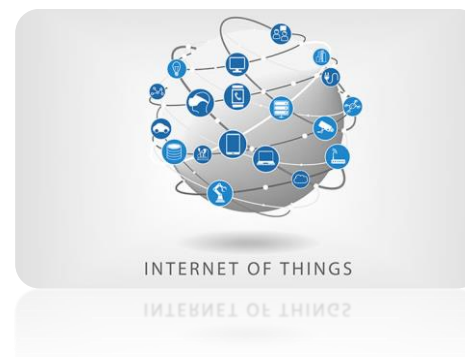Source: Technological Singularity Source: Kurzweil 2006

The Dawn of the 4ᵗʰ Industrial Revolution

• Artificial Intelligence & Other Technologies

ARTIFICIAL INTELLIGENCE TERMS

ARTIFICIAL INTELLIGENCE
- **AI** is an umbrella term for machines capable of perception, logic, and learning.

MACHINE LEARNING
- **Machine learning** employs algorithms that learn from data to make predictions or decisions, and whose performance improves when exposed to more data over time.

DEEP LEARNING
- **Deep learning** uses many-layered neural networks to build algorithms that find the best way to perform tasks on their own, based on vast sets of data.

INTERNET OF THINGS

BIG DATA

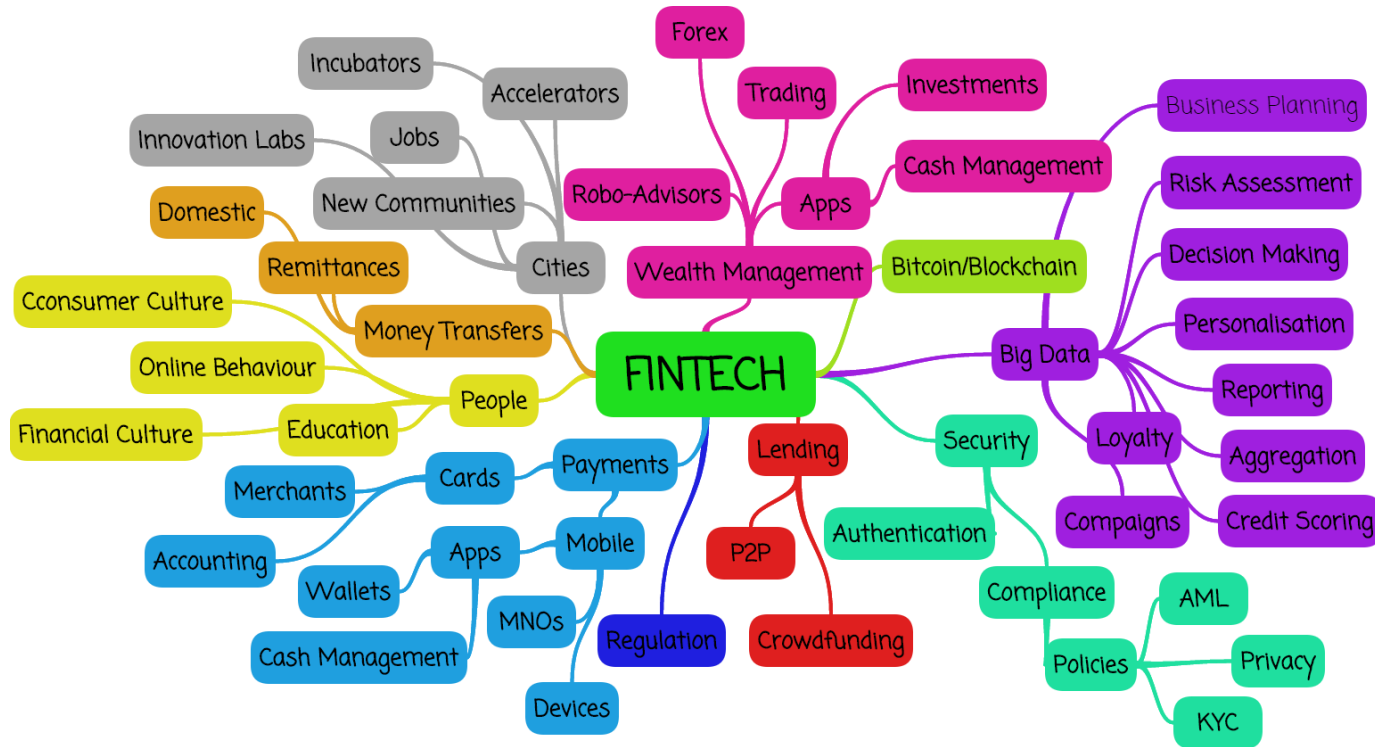https://www.hitec-dubai.com/back-to-basics-using-big-data-to-improve-customer-experience/

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What is Fintech

- "Fintech …refers to the innovative use of technology in the design and delivery of financial services and products."

  World Economic Forum

Digital Intelligent Transformation

The Evolution of Money and Beyond

1. **Barter** (no money)

2. **Commodities / Precious metals** (money from nature)

3. **Printed money /coins** (money from institutions – direct)

4. **Plastic money** (money from institutions – indirect)

5. **Cryptocurrencies/Network money** (money as apps: borderless & unmediated)

https://steemit.com/steemit/@cryptomoni/6-stages-of-history-and-evolution-of-money

Solution Behind Cryptos: Blockchain - The Internet of Trust

The Origin

Blockchain was introduced, in 2008, as the technology underlying Bitcoin, the platform and cryptocurrency that has gained immense popularity due to the upward trend in the value of bitcoins.

The Potential

Despite it being invented to support Bitcoin, important stakeholders from various industries recognized its potential and started exploring applications of the technology to either improve current practices, or create news one that were not possible until now.

Bitcoin is a private, decentralized, digital cryptocurrency

➢ **Decentralized**: No issuing party; units are issued algorithmically

➢ **Digital**: Fully electronic; with no underlying peg to assets

➢ **Cryptocurrency**: Anti-counterfeiting through cryptography

Blockchain - The Internet of Trust

A distributed **ledger** of any type of transactions;

- **Transaction** – exchange of data that represent medical data, consumer details, product data….

- **Shared:** blockchains do not make much sense unless two or more parties (or systems) are involved.

- **Time-stamped:** transactions are stored in chronological order.

- **Append-only**: you can only add new transactions to a blockchain. **Immutable**: Once written, a transaction cannot be erased or altered.

- **Cryptographically-secured**: advanced cryptography enables all the above

- **Enables smart contracts:** can be programmed so that certain conditions are met.
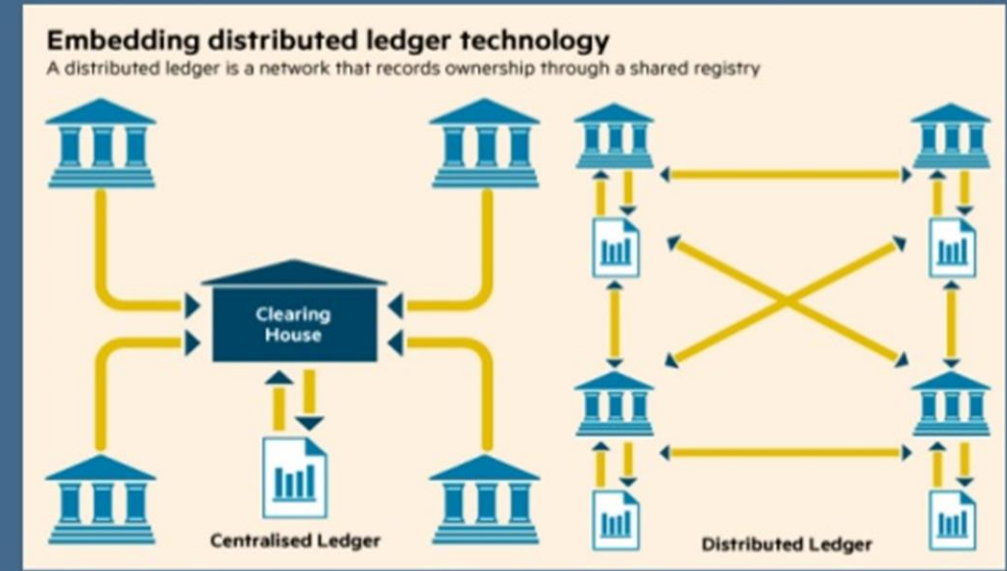
Source: Financial Times

Source : http://blog.cryptoig.ca/?p=380

The Fintech Revolution ➡ Decentralized AI

◤ **Decentralized AI – where AI and blockchain intersect - to capitalize on one's strength to aid the other:**
- ◤ **Data protection**

◤ AI depends on our data and uses it to improve itself through machine learning
- ◤ data on human interactions and other details

- ◤ Blockchain is a technology that safely stores/transmits trustworthy data
  - ◤ Blockchains create a new internet layer – removing the intermediaries across industries
  - ◤ From the Internet of information ➡ to the Internet of value and trust

- ◤ So when we integrate blockchain and AI, it means we have a protected decentralized AI system for sensitive data such as financial or even medical data.
- ➡ blockchain technology is a great security advantage.

The Fintech Revolution ➜ Decentralized AI

◥ **This implies:**

◤ **More secure systems - i**n a centralized system, hackers or malware can penetrate an AI system and modify its instructions.

◤ With blockchain, before any information is accepted and processed on a blockchain platform, it must go through several nodes or phases of the network on the system. **It becomes more difficult to hack any blockchain-based technology** when it has more nodes on its network.

◤ **Decentralized Intelligence –** resulting from the technology integration.

◤ Blockchain is a decentralized system while AI is an intelligent system. The combination enables organizations to set up a blockchain-based architecture based on a peer-to-peer connection that has an image recognition feature or language processing.

https://espeoblockchain.com/blog/decentralized-ai-benefits/

The Fintech Revolution ➡ Decentralized AI

◤ **Flexible AI -** AI integration with blockchain will pave the way for the development of an artificial general intelligence (AGI) platform – distributed one..

◤ Blockchain + AI + other emerging techs = disruption

➡ the complementarity between the two ➡ breakthrough innovations in several areas, including:

- ◤ Medicine
- ◤ Autonomous vehicles, (imagine **self-driving cars bidding for your ride**)
- ◤ Smart contracts
- ◤ Decentralized autonomous organizations (DAOs)
- ◤ Financial services
- ◤ AI-based, economic agents Cloud-based, human-less corporations (imagine a **blockchain-based lawyer/notary/bank**)
- ◤ And many additional areas of applications, not yet conceived at present.

https://www.fintechnews.org/how-blockchain-is-changing-the-future-of-fintech-industry/

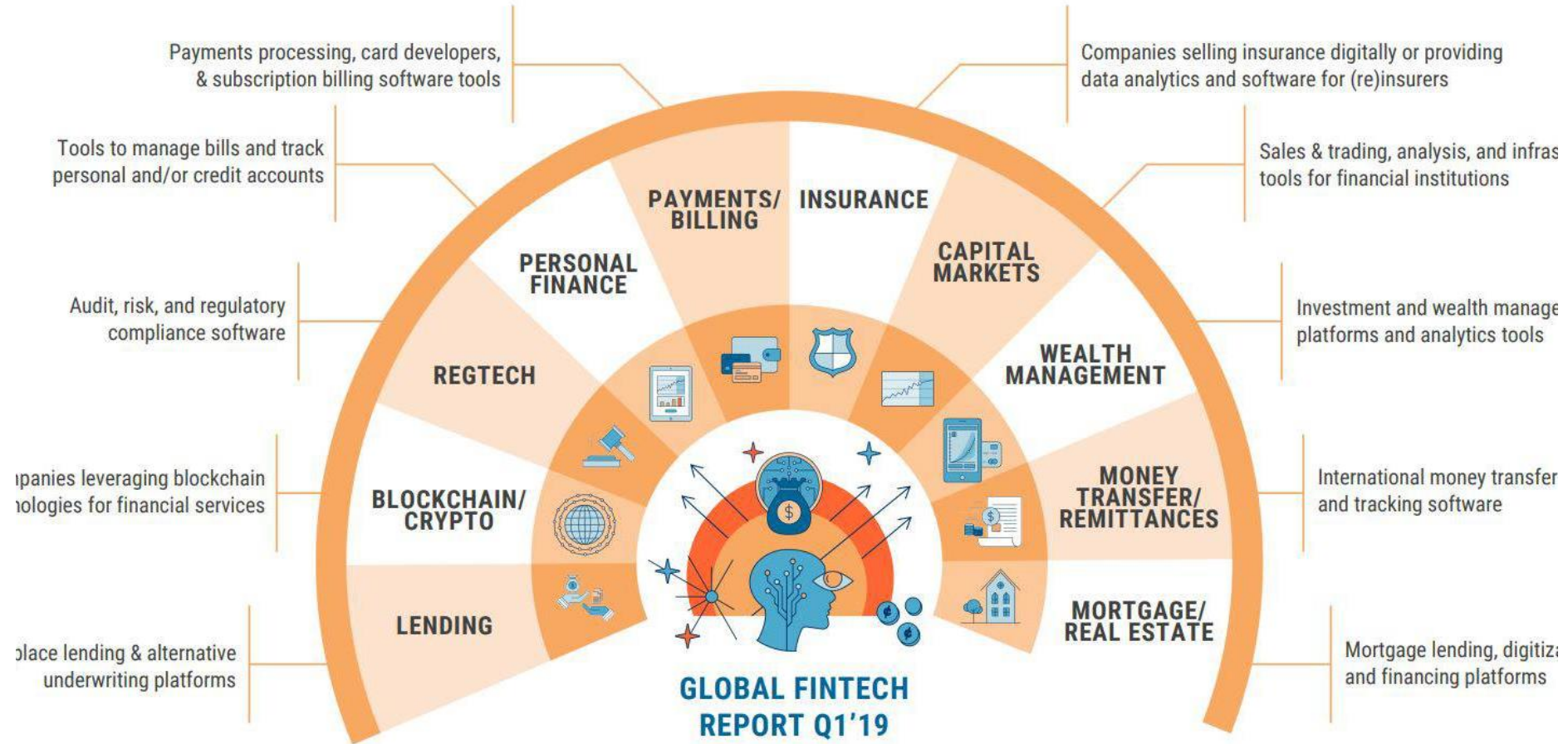# The Fintech Revolution ➡ Decentralized AI

◥ Moreover,
  ◥ Cryptocurrencies ➡ new forms of money
  ◥ Money that is programmable and active – money for machines
  ◥ Money transacted in nano-quantities leading to m2m commerce

◥ Markets that rely on the following mechanisms:
  ◥ **Intermediation**
  ◥ **Clearing and settlement**
  ◥ **Recording and information keeping**
  ◥ Rating, recommendation, voting
  ◥ **Databases**
  ◥ Distributed storage, authentication, anonymization
  ◥ Incentive schemes (rewarding / punishing)
  ◥ **Transaction traceability**
  ◥ **Refereeing, arbitration**
  ◥ **Notarization**

Will be disrupted
Banking/finance is right in the epicenter!

Potential Areas of Application in Fintech

Payments processing, card developers, & subscription billing software tools

Companies selling insurance digitally or providing data analytics and software for (re)insurers

Tools to manage bills and track personal and/or credit accounts

Sales & trading, analysis, and infras tools for financial institutions

Audit, risk, and regulatory compliance software

Investment and wealth manage platforms and analytics tools

panies leveraging blockchain nologies for financial services

International money transfer and tracking software

place lending & alternative underwriting platforms

Mortgage lending, digitiz and financing platforms

PAYMENTS/ BILLING
INSURANCE
PERSONAL FINANCE
CAPITAL MARKETS
REGTECH
WEALTH MANAGEMENT
BLOCKCHAIN/ CRYPTO
MONEY TRANSFER/ REMITTANCES
LENDING
MORTGAGE/ REAL ESTATE

GLOBAL FINTECH REPORT Q1'19

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unic.ac.cy/iff

Challenges

- Technology maturity;
- Regulatory framework;
- Consumer protection;
- Standards to use blockchain on an industrial scale are still not in place;
- Replacing existing infrastructure – time and investment;
- …..

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Concluding Remarks

◣ The Future of Finance = Fintech, AI, Blockchain + other technologies
  ◣ New technologies are rapidly reshaping the entire financial services spectrum
  ◣ the main drivers helping transform the finance businesses and stay on top of ever-changing consumer expectations

◣ How to apply AI + Blockchain to Finance ID, Data, research, sentiment, predictive insights, credit scoring, fraud, cybersecurity, personalisation, search, chatbots, sensor, reward loyalty programs Blockchain AI

◣ Finance is about managing financial assets. This now is all about technology and data but without forgetting the basics - clients / partners.

◣ The future biggest financial player are not just banks…
  ◣ Amazon, Alibaba, Apple, Facebook…

Social consequences will be vast

"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change"

Charles Darwin

Institute For the Future

blockchain.initiative.

Thank You!

Other References

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