

# ISSA | Emerging Technologies for Leaders

Zurich-May 10, 2023

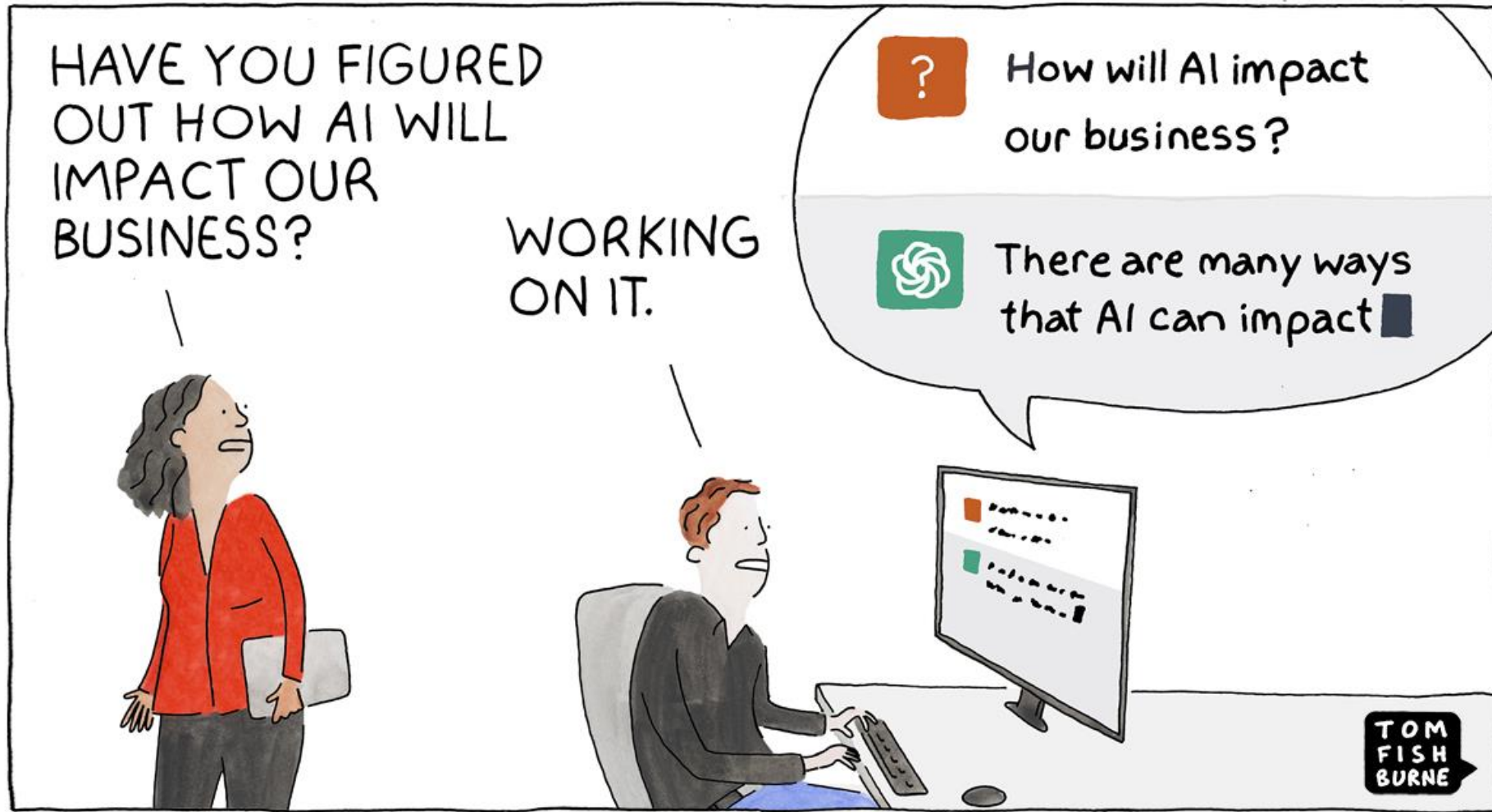


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**S&P Global**

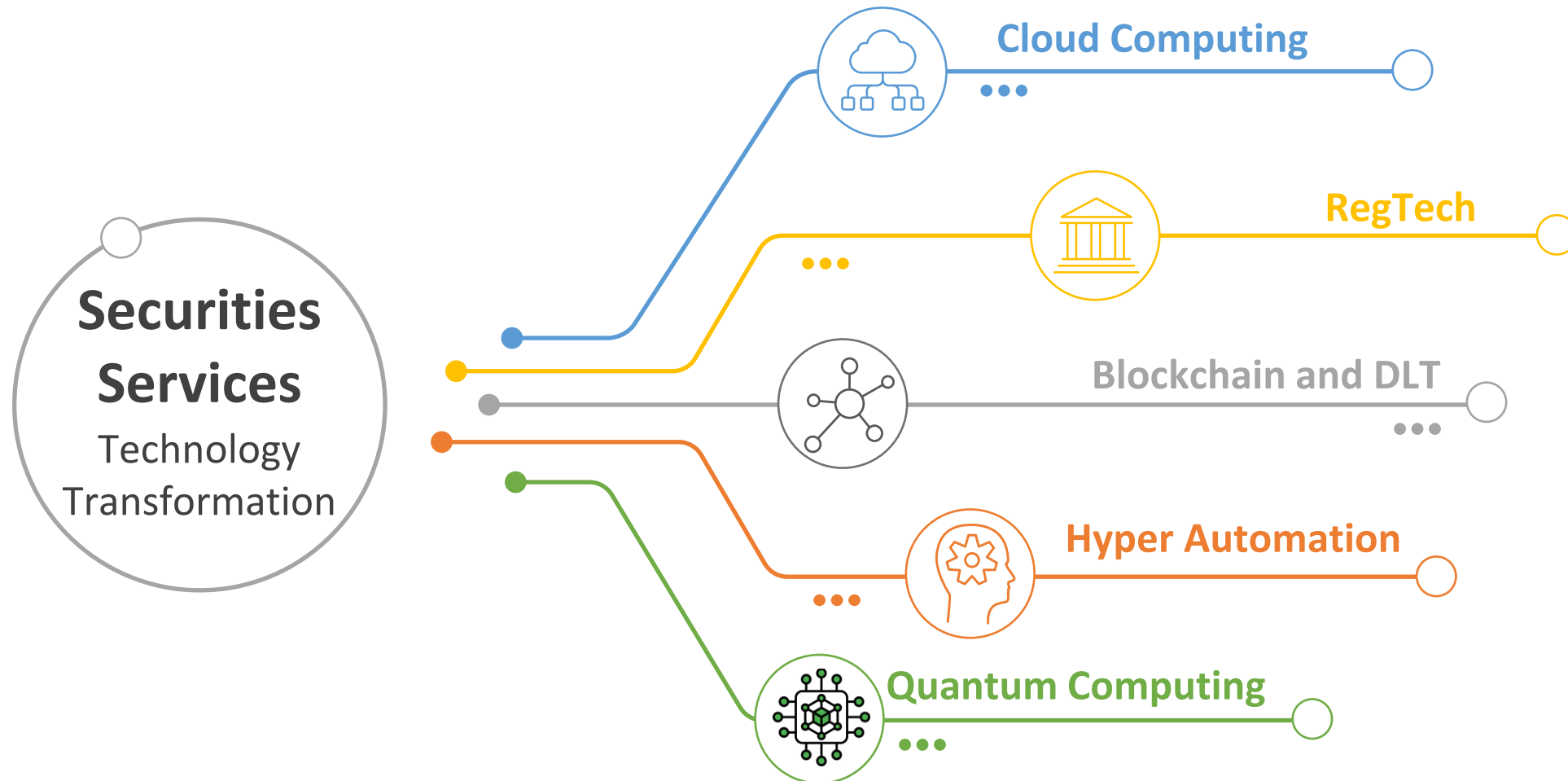
Market Intelligence

# Foreword

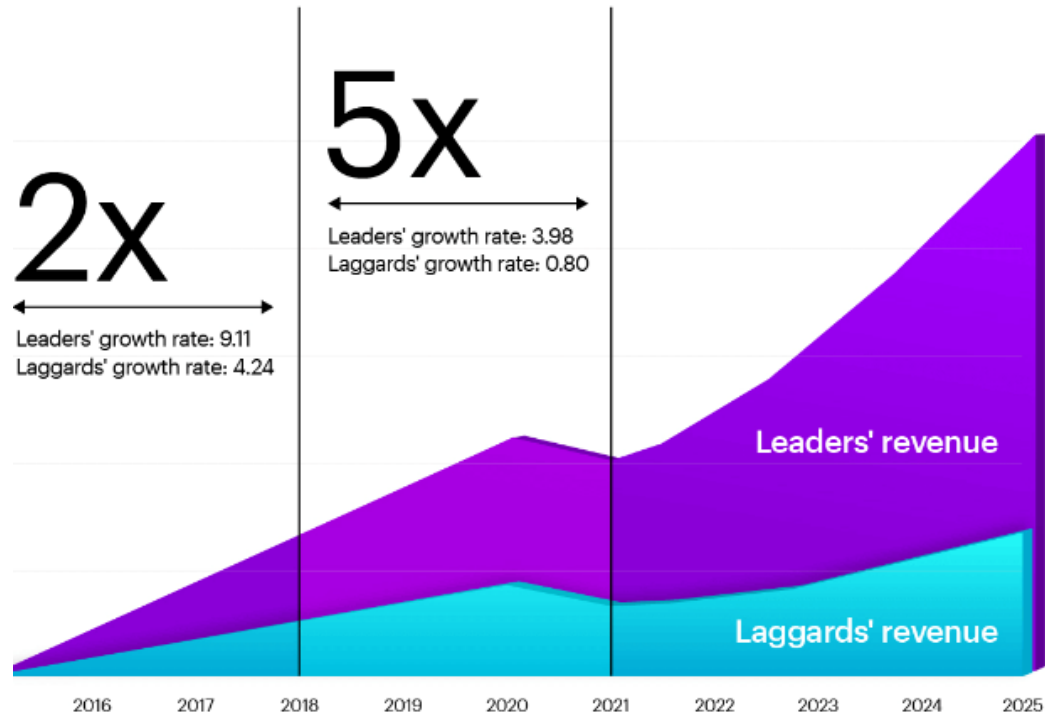


# Introduction

The securities services industry, along with the broader financial services industry, are witnessing the emergence of several technologies that have the potential to revolutionize traditional processes and reshape the way securities are managed, cleared, settled, and reported.



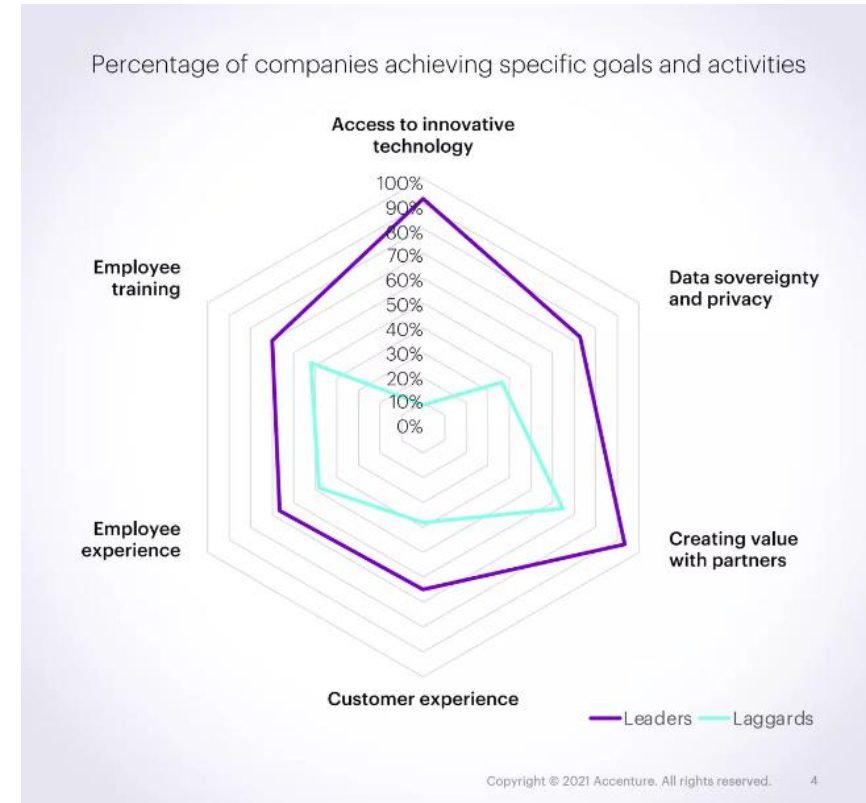
# Technology transformation as engine for growth



- In 2019, **Technology Leaders** in tech adoption and innovation were growing revenues at 2x the speed of tech Laggards.
- Post covid, **Technology Leaders** have moved even further ahead of the pack and have been growing at 5x the rate of Laggards on average

Source: Accenture

Sensitivity: C2 Internal

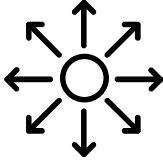


*"The Investment in key technologies – such as cloud and AI – helped Leaders not only absorb impact quickly but refocus on growth"*

# Cloud Computing



Cost-Effective



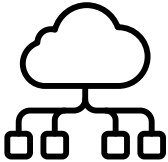
Scalability  
Flexibility



Accessibility  
Availability



Innovation  
Agility

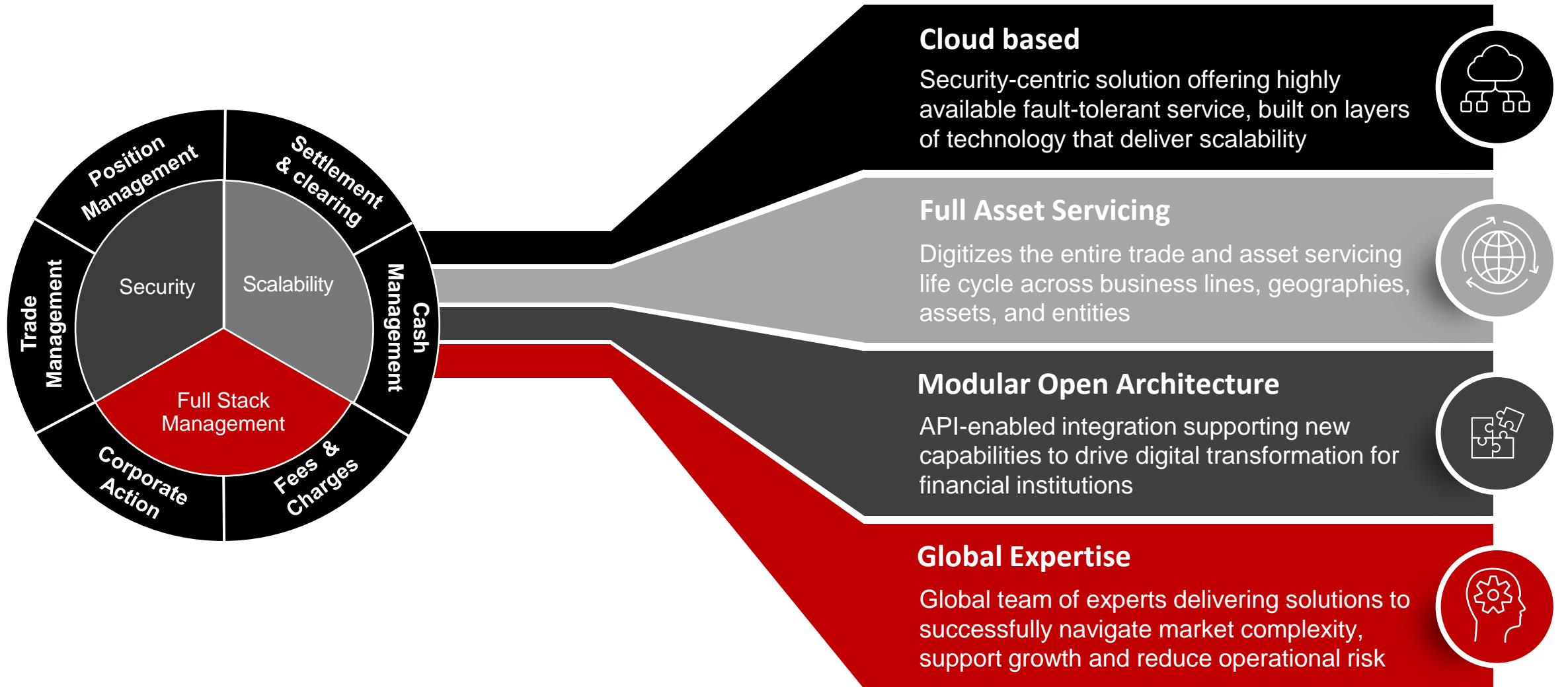


Disaster Recovery  
Business Continuity

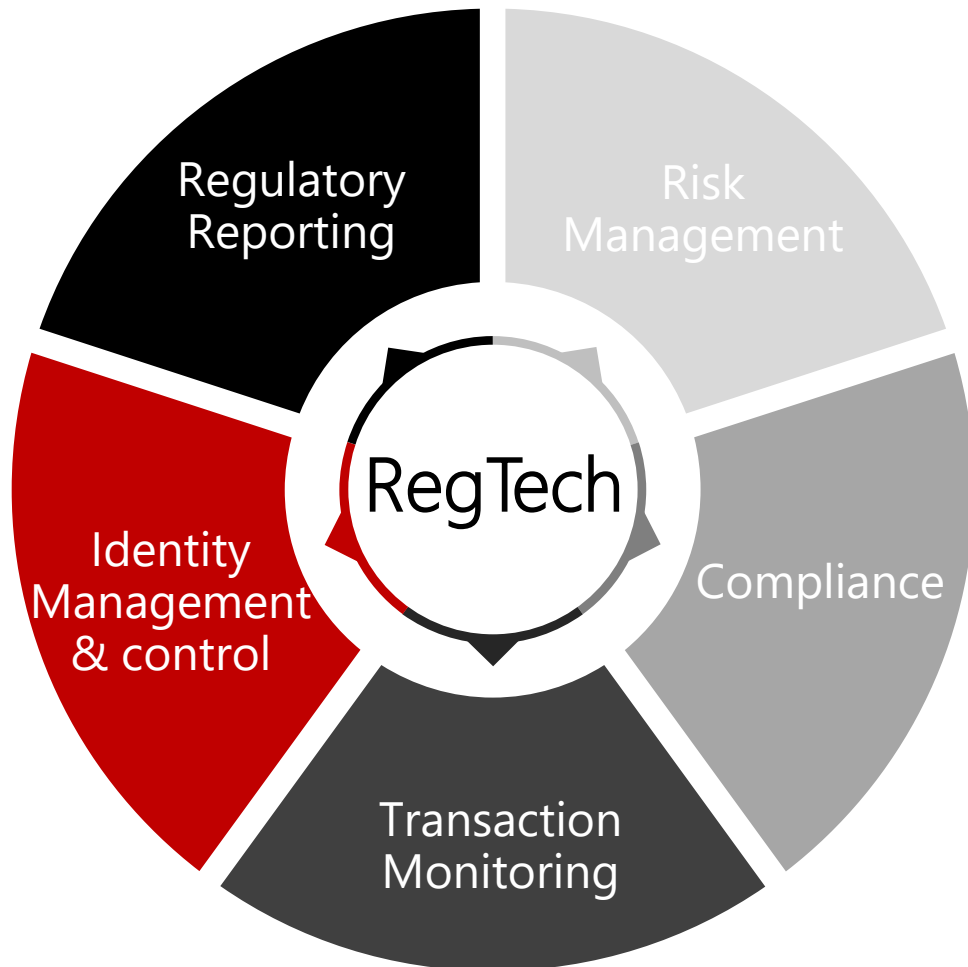


Reliability  
Security

# Cloud Computing | Cloud based Securities Processing Platform



# RegTech



- RegTech solutions leverage technology to streamline compliance processes in the securities services industry by automating compliance monitoring, reporting, and risk assessments.
- RegTech can help securities services providers stay compliant with evolving regulations, reduce risks, and enhance transparency.
- RegTech leverages multiple modern technologies to provide:
  - Streamlined compliance management
  - Increased efficiency
  - Improved Accuracy
  - Internal alignment
  - Better customer Experience

# Blockchain and DLT

Blockchain and DLT offer enhanced transparency, security, and efficiency through decentralized, immutable, and tamper-proof records. These technologies can streamline processes such as clearing, settlement, and custody, reducing the need for intermediaries and simplifying complex workflows. Blockchain and DLT can improve operational efficiencies, reduce costs, and mitigate risks in the securities services industry.

- Real-Time transaction settlement
- Digital Asset Support Services
- Authentication ecosystems based on zero-knowledge proof
- Decentralized finance (DeFi)



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# Blockchain and DLT

- Real-Time transaction settlement
- Digital Asset Support Services

## Benefits of Blockchain

- Immutability & Transparency
- Decentralised
- Round the clock availability
- Use of Smart Contracts

## Where are we now?

- Further pilot & experiments
- Technology adoption
- Still some way to go

- Authentication ecosystems based on zero-knowledge proof
- Decentralized finance (DeFi)

## Challenges

- Complex technology
- Regulatory Implication
- Implementation challenges
- Competing platforms

# Blockchain and DLT

- Real-Time transaction settlement
- Digital Asset Support Services
- Authentication ecosystems based on zero-knowledge proof
- Decentralized finance (DeFi)
- Tokenization for unlisted companies or private equity funds
- Spot exchange between established currencies and cryptocurrencies on digital exchanges
- Digital custody

# Blockchain and DLT

- Real-Time transaction settlement
- Digital Asset Support Services
- Authentication ecosystems based on zero-knowledge proof
- Decentralized finance (DeFi)

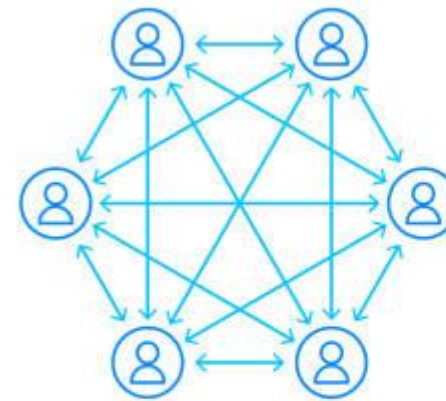
Zero-knowledge proof is a method by which one party (the prover) can prove to another party (the verifier) that a statement is true without revealing any additional information.

The popularity of zero-knowledge proofs in blockchain and crypto is driven by the increasing demand for privacy and security in digital transactions. With the rise of blockchain technology and cryptocurrency, there is a growing need for a way to verify transactions without revealing sensitive information — a need ZKPs can meet.

Only information required for each specific transaction is shared, while all other data remains safely on the server of the trusted provider

# Blockchain and DLT

- Real-Time transaction settlement
- Digital Asset Support Services
- Authentication ecosystems based on zero-knowledge proof
- **Decentralized finance (DeFi)**
- Unbundling of traditional finance by enabling peer to peer exchanges
- Enabled by decentralised nature of Blockchain
- Mostly build on Ethereum
- Unregulated
- Technology risk, Liquidity risk and Product risk



**DeFi**  
Decentralized Finance

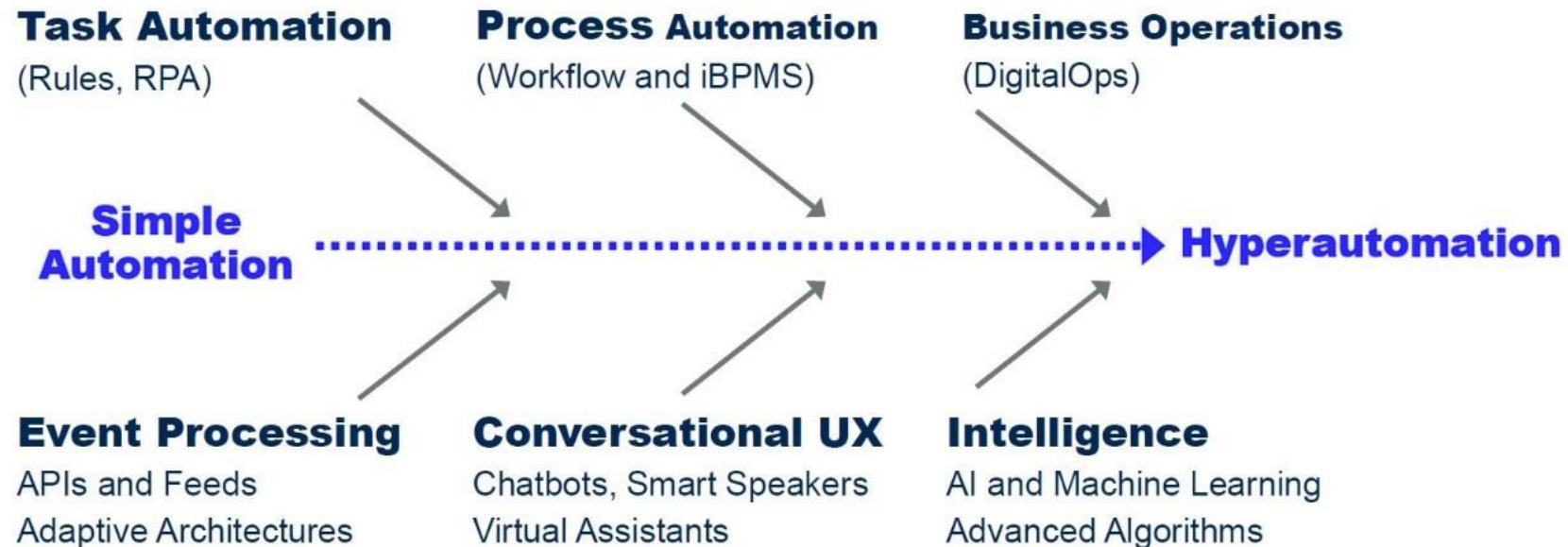


**CeFi**  
Centralized Finance

# Hyper Automation | Introduction

Hyper automation is a concept that refers to the use of advanced technologies, such as artificial intelligence (AI), machine learning (ML), and robotic process automation (RPA), to automate complex business processes

## The Path to Hyperautomation



# Hyper Automation | Robotic Process Automation (RPA)

Robotic process automation or RPA is the most common tool used for automation, simply automating fixed and repetitive processes. Automation, unlike AI, uses a simple series of rules (If this = then that) to create relatively simple but reliable results. These pre-programmed rules can encompass structured data (incoming data on interest charts) or unstructured data (forms filled in by hand) to handle digitization, approval, risk flagging, and so on. Many also integrate learning patterns, so that they improve over time based on increasing volumes of data.

## Benefits

- Lower costs
- Reduce human error
- Improve efficiency and user experience
- Improve compliance and auditing

## Challenges

- Integration with legacy systems
- Access to data to fuel automation
- IT resources and budget
- Change management

## Low/no code RPA

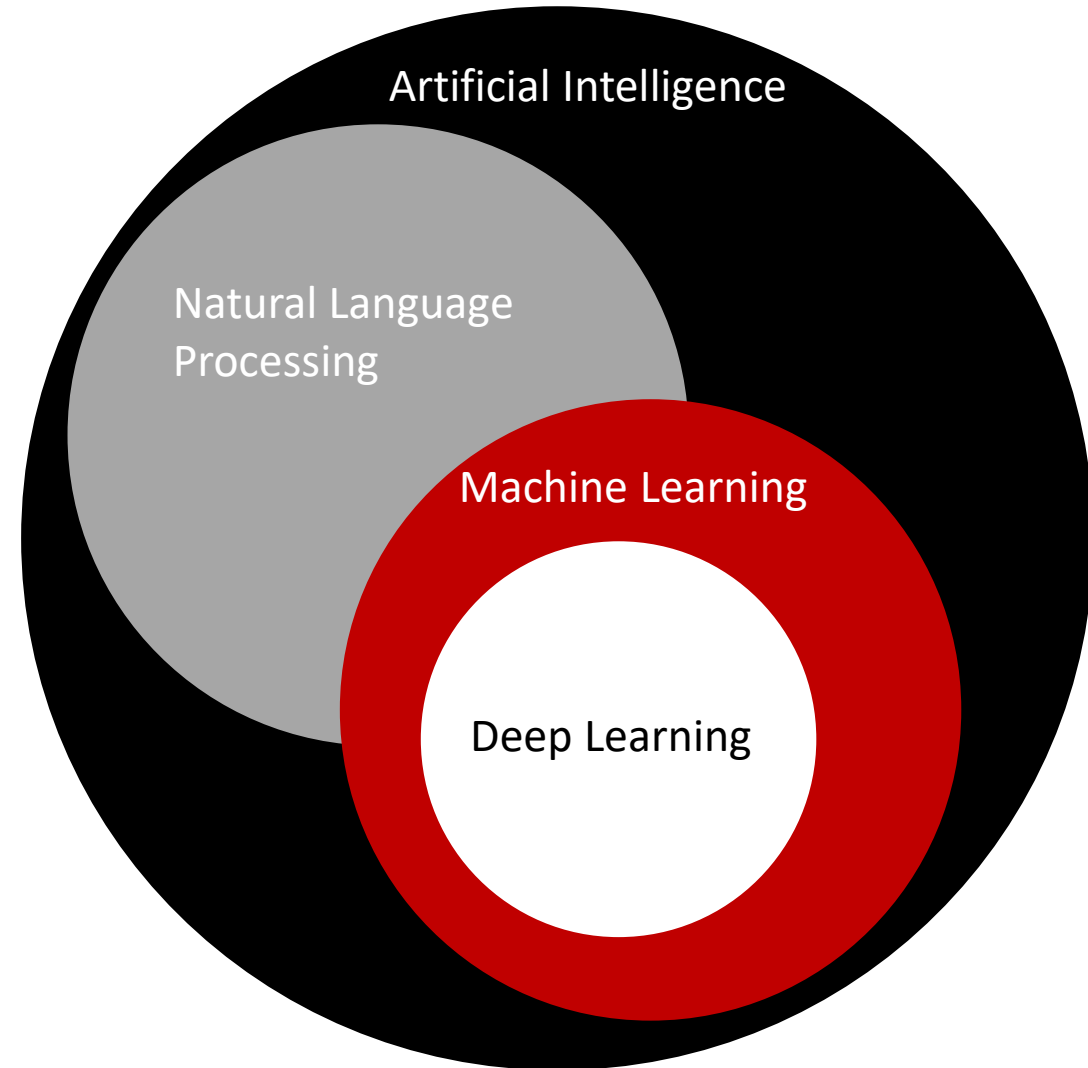
Low-code or no-code is a UI-based approach to software development wherein the users drag and drop and record activities to automate processes, therefore eliminating the dependency on code and coders in application development.

- Faster time to market
- Cost efficient

- More complex automation
- Easier integration and maintenance

- Event based Processing
- bridge tech resources gap

# Hyper Automation | Artificial Intelligence & Machine Learning



## **Artificial Intelligence (AI)**

Ability of machine to imitate human intelligence

## **Natural Language Processing (NLP)**

Focuses on how computers understand (Natural Language Understanding- NLU) and Generate (Natural Language Generation – NLG) human language

## **Machine learning (ML)**

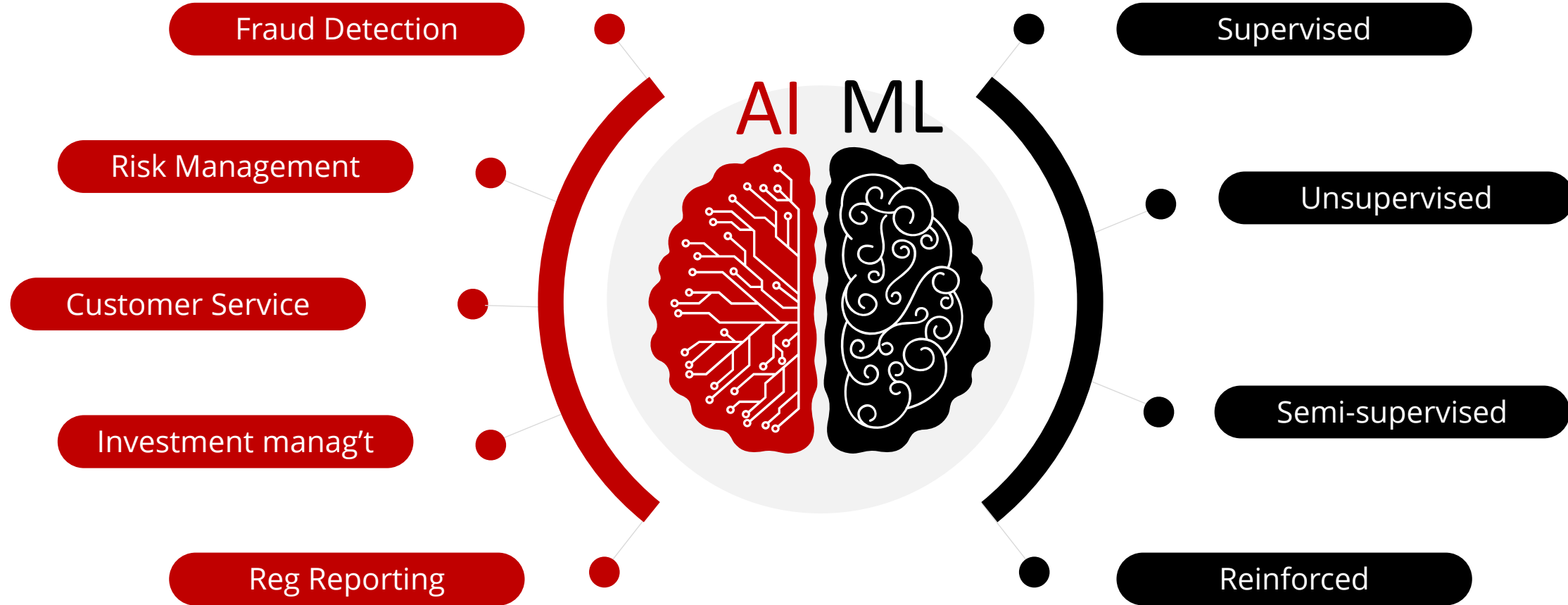
Statistical techniques that enable machines to improve at tasks with experience by automatically learning from data: Supervised, unsupervised, semi-supervised or Reinforced Learning

## **Deep Learning (DL)**

Algorithms that mimic human brain to incorporate intelligence into machine by automatically learning from data



# Hyper Automation | Artificial Intelligence & Machine Learning



# Hyper Automation | Generative AI

Generative AI refers to a set of machine learning techniques and algorithms that generate new content, such as images, music, text, videos, and other types of media. It is done by learning the structure and patterns in the training data and generating similar data pattern

Generate images from text description or fill gaps in images with using Deep Learning with DALL-E

Generate Audio: create Music in the style of a given genre, converse verbally, etc.

Generate textual content for a variety of use (articles, conversations, summarization, translation, poetry, etc.) with Large Language Models (LLMs) like ChatGPT

Generate data to fill gaps in data timeseries

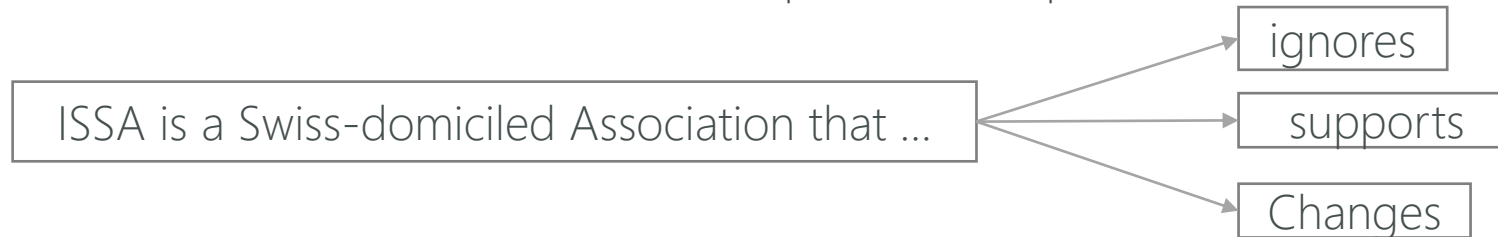
# Hyper Automation | LMs & LLMs

Language Model (LM) today are primary statistical and based on advanced machine learning models (Deep Learning)

The Model is trained to predict continuation, the next word given a context (a sequence of words).



The new word is added to the context and operation is repeated



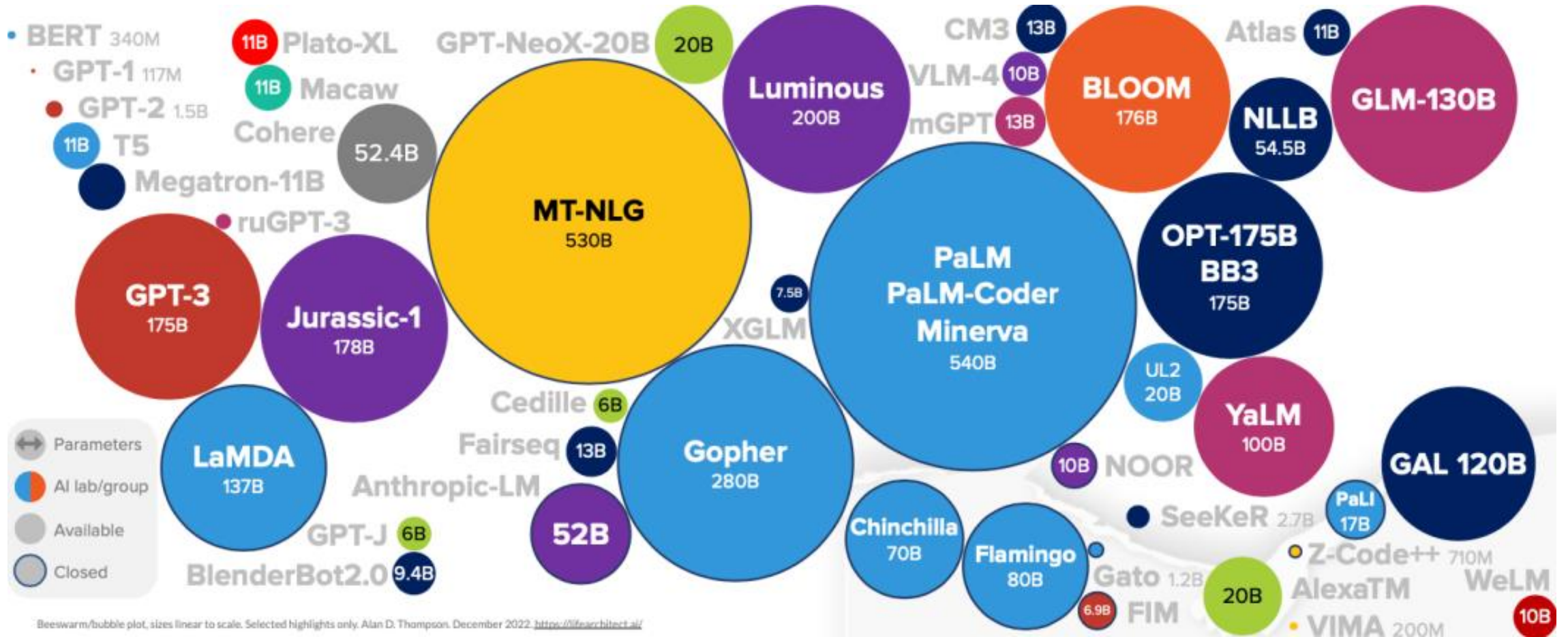
LMs are typically on selected set of documents such web pages, books, Wikipedia, source code etc., called corpus

LMs are not new: we leave and experience LLMs everyday though automated answering systems, Alexa, SIRI, google home, dictation software.

**Large Language Models (LLMs)** are LMs with billions of parameters trained on very large corpus

# Hyper Automation | LMs & LLMs

Today, Large Language Models are available from various organizations (Google, OpenAI, Facebook, Microsoft, DeepMind, etc.)



# Hyper Automation | Chat GPT

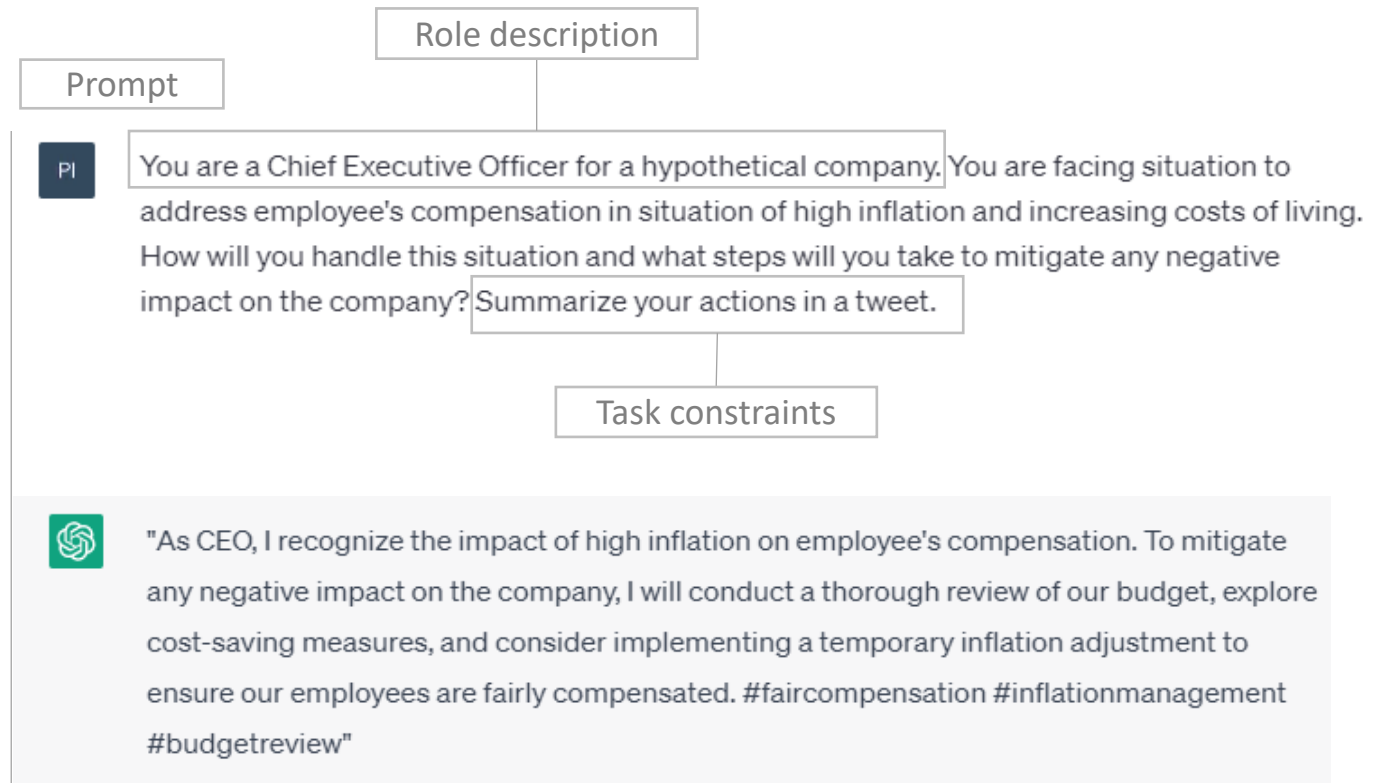
ChatGPT is made of two main components:

- An LLMs that has been training with human interaction to provide human-like answer to request (prompt)
- Answers depend on how the prompts (requests) are designed

**Prompt engineering** is a set of techniques to guide LLMs to achieve expected result and reduce chance of errors: giving identity, task description objectives, adding constraints

ChatGPT uses GPT-3.5/4 as LLMs that is specially aligned for conversations

Text generated by LLMs may suffer from many problems, most notably hallucinations (plausible answers but not rooted in reality or inaccurate answers)



# Generative AI | Key considerations

- Uncertainty
- Explainability
- Information bias
- Data Privacy
- Ethical considerations

Culture

## AI-generated Drake and The Weeknd song goes viral

© 17 April

## Magazine editor sacked over AI-generated Schumacher interview

## The rapid rise of generative AI threatens to upend US patent system









Intellectual property laws cannot handle possibility artificial intelligence could invent things on its own

## The Andy Warhol Copyright Case That Could Transform Generative AI

The US Supreme Court's upcoming decision could shift the interpretation of fair use law—and all the people, and tools, that turn to it for protection.

# Quantum Computing | Introduction

- Quantum computing is a new type of computing that uses quantum-mechanical phenomena to perform operations on data
- Quantum computers use quantum bits (qubits) which can exist in multiple states simultaneously, enabling them to perform certain computations much faster than classical computers
- Building and programming quantum computers is extremely challenging, and requires specialized expertise and equipment
- Despite these challenges, significant progress has been made in recent years, and companies and governments around the world are investing in quantum computing research and development
- As quantum computing continues to advance, it will likely have a transformative impact on financial services in several ways:
  - Improved Risk Management
  - Faster Trading and Portfolio optimization
  - Enhanced Cryptography
  - Fraud detection
  - Optimisation of resource allocation

Quantum Computing	Vs.	Classical Computing
 <p>Calculates with qubits, which can represent 0 and 1 at the same time</p>		 <p>Calculates with transistors, which can represent either 0 or 1</p>
 <p>Power increases exponentially in proportion to the number of qubits</p>		 <p>Power increases in a 1:1 relationship with the number of transistors</p>
 <p>Quantum computers have high error rates and need to be kept ultracold</p>		 <p>Classical computers have low error rates and can operate at room temp</p>
 <p>Well suited for tasks like optimization problems, data analysis, and simulations</p>		 <p>Most everyday processing is best handled by classical computers</p>

# Emerging Technologies for Leaders | Conclusion

- Key for Leaders to understand the technology megatrends
- Significant benefits:
  - Faster and more efficient processes
  - Lower TCO
  - Improved customer experience
  - Drive growth and profitability
- Understand the challenges and needed investments to support successful implementation



# Emerging Technologies for Leaders | Conclusion

PI

could you please provide me with the content for the conclusion of a presentation on "emerging technology for Securities Services leaders"?



Sure, here's some content for the conclusion of a presentation on "emerging technology for Securities Services leaders":

Conclusion:

In conclusion, emerging technologies are transforming the Securities Services industry in many ways. From blockchain to artificial intelligence to quantum computing, these technologies are enabling faster, more efficient, and more secure processing of securities transactions and data.

As Securities Services leaders, it is important to stay abreast of these emerging technologies and to explore how they can be used to improve our operations and services. By embracing these technologies, we can enhance our risk management, improve our customer experience, and drive growth and profitability.

However, it is also important to recognize that adopting these technologies can be challenging and requires significant investment in technology, expertise, and infrastructure. It is essential to carefully assess the risks and benefits of each technology and to develop a clear strategy for implementation and adoption.

Ultimately, by embracing emerging technologies and leveraging their benefits, Securities Services leaders can position their organizations for success in an increasingly competitive and dynamic marketplace. Thank you for your attention, and I look forward to working together to realize the full potential of these exciting technologies.