ARTIFICIAL INTELLIGENCE

DR. MITIL CHOKSHI

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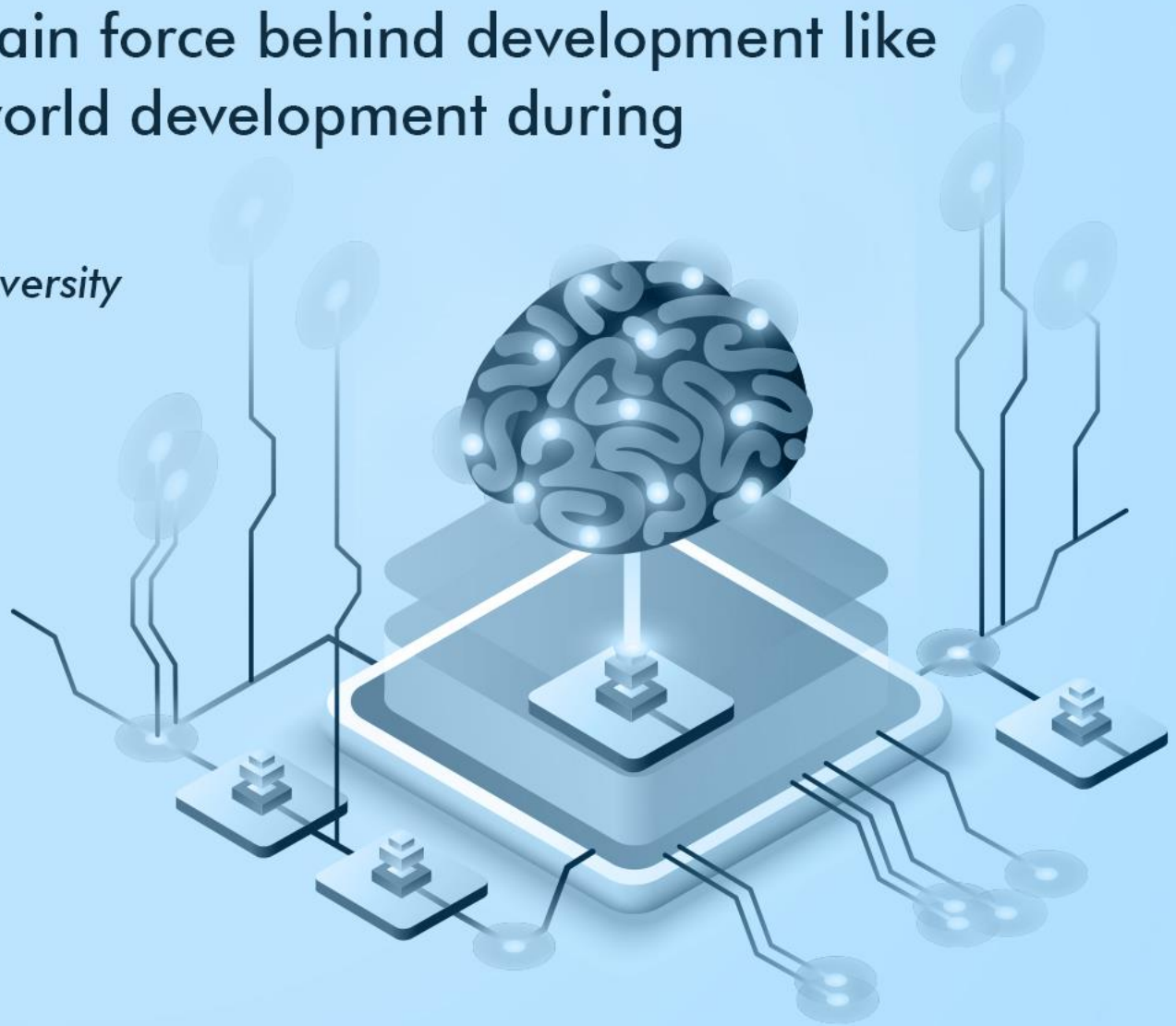
WHY AI

AI is the next electricity; it will be the main force behind development like how electricity played a major role in world development during the early 20th century.

– Professor Andrew Ng, Stanford University



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Data Ingestion

Data Transformation

Data Modeling

Results Visualization

Pre-Built, Secure System

50+ Connectors

On Premises & On Cloud

Business Insights

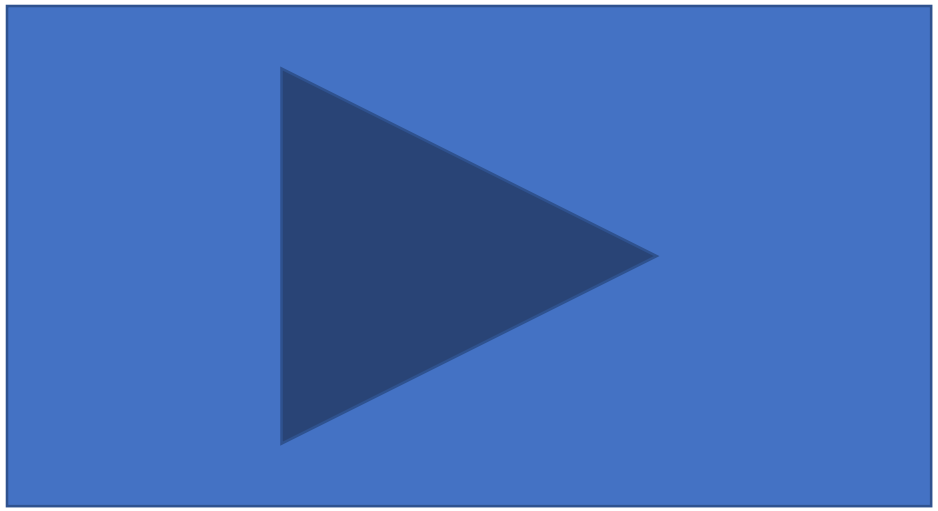
Customer Journey

Cross sell / Up sell

Anomaly Detection

Social Analytics

What is Artificial Intelligence



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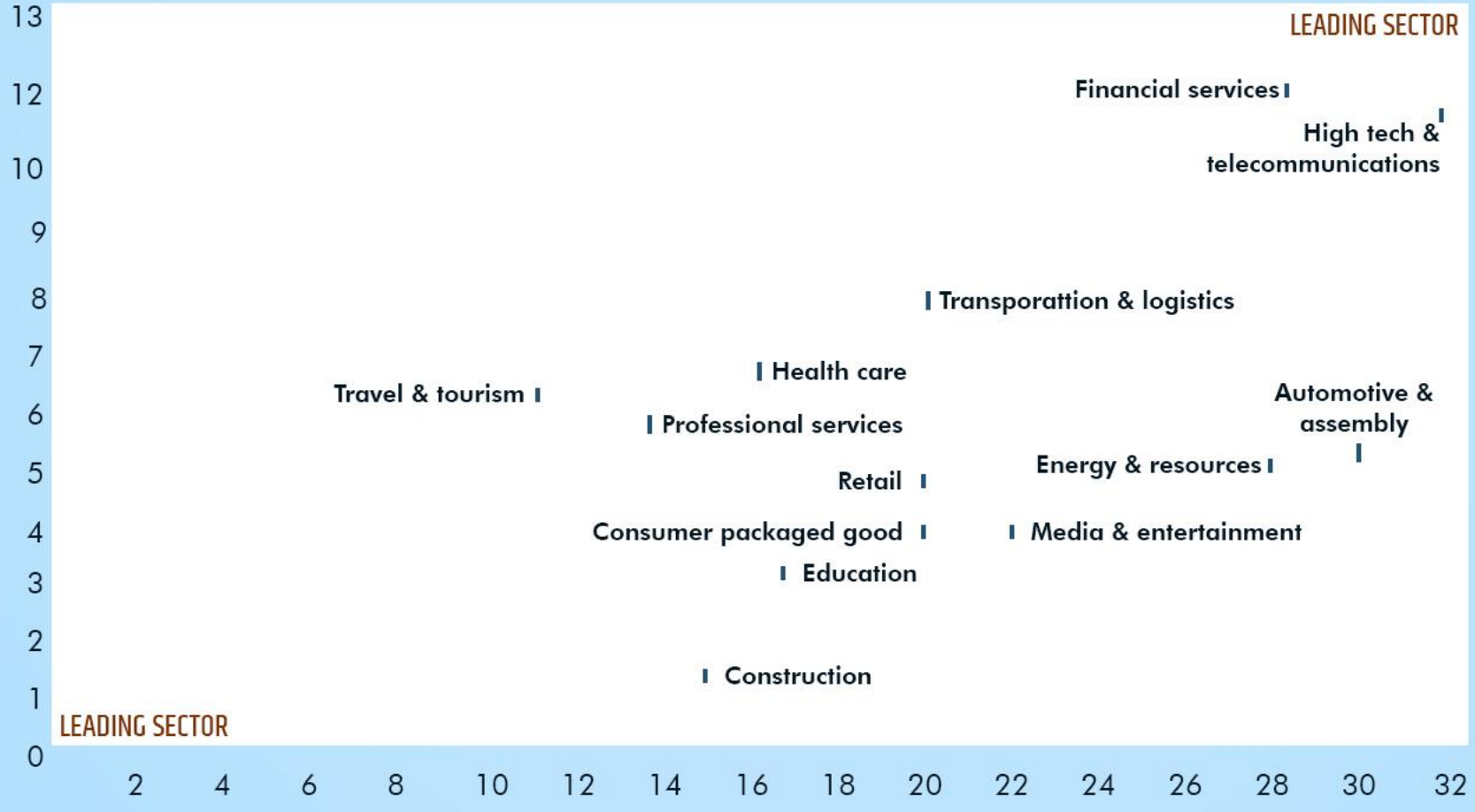
CURRENT AI ADOPTION AND FUTURE AI INVESTMENTS BY SECTOR

Future AI demand trajectory

Average estimated % change in AI spending, next 3 year, weighted by firm size



Current AI adoption

% of firm adopting one or more AI technology at scale or in a core part of their business, weighted by firm size

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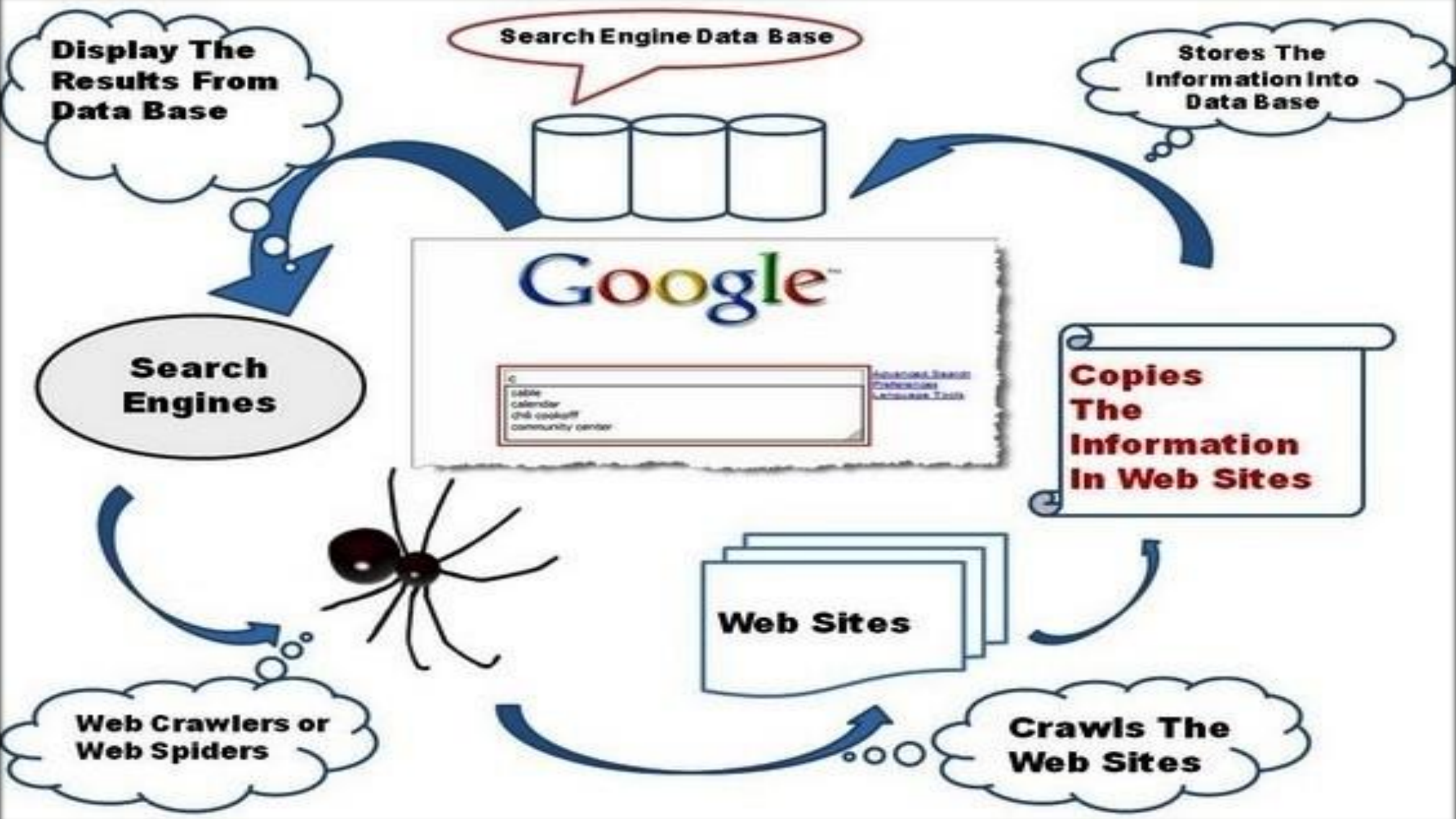
Source : McKinsey Global Institute AI Adoption & use survey

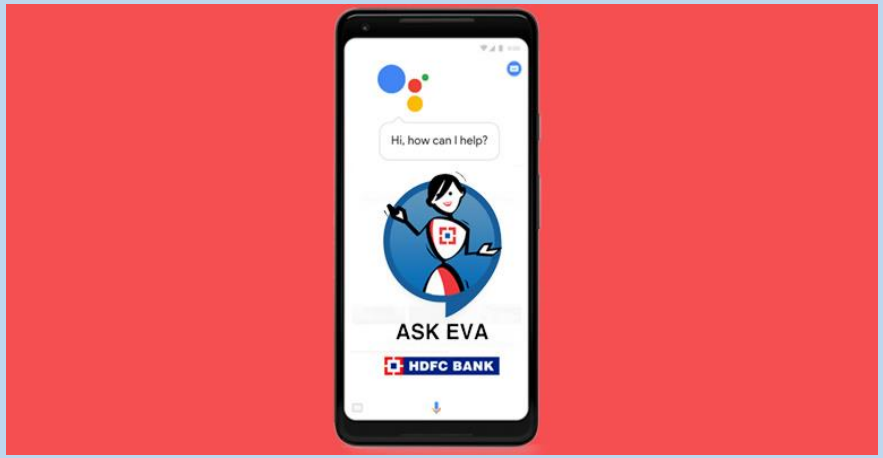
WHAT IS AI

- Sense
  - Computer Vision
  - Audio Processing
- Comprehend
  - Natural Language Processing
  - Knowledge Representation
- Act
  - Machine Learning
  - Expert Systems

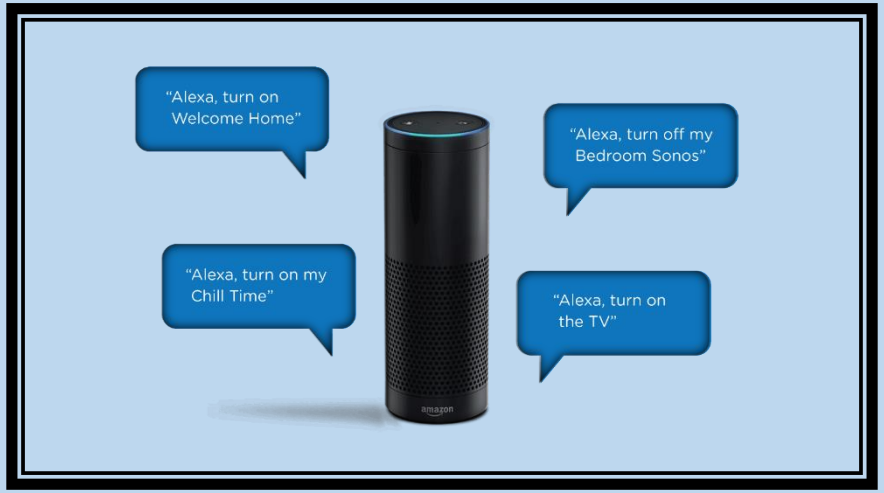
- Virtual Agents
- Identity Analytics
- Congnitive Robotics
- Speech Analytics
- Recommendation Systems
- Data Visualization


Display The Results From Data Base
Search Engine Data Base
Stores The Information Into Data Base
Google
Search Engines
Copies The Information In Web Sites
Web Sites
Web Crawlers or Web Spiders
Crawls The Web Sites

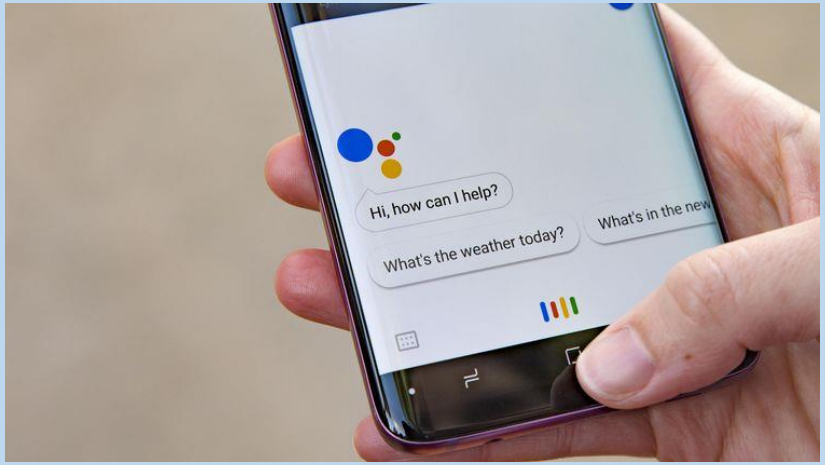
EVA - SMART CHAT BOX



AMAZON ECHO



GOOGLE ASSISTANT



TESLA – SELF DRIVING

IBM Watson

BENIFITS OF AI

1. Security: The information stored in the accounting database is digitally protected.

2. Cost-Effective: AI will help in reducing the amount of paperwork and other resources.

3. Flexible: The accounting system designed with AI is more flexible and reliable.

4.**Automation:** AI will handle basic accounting tasks, such as bank reconciliations, invoice categorization, risk assessment, and audit processes, like expense submissions and invoice payments.

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AI is the “next frontier” for audit, after data analytics. One possible future use case for AI is the analysis of unstructured data such as emails, social media posts and conference call files to search for evidence of fraud.

AI IN AUDITING

1. *Predictive and forecasting solutions*
2. *Smart assistants*
3. *Automatic tagging and allocation of transactions*
4. *Anomaly detection*
5. *OCR solutions*
6. *Risk Analysis*

Traditional Audits VS. Future Audits

The major driver of big data being used in the modern day audit results from clients demand for more correct and precise audits:

- Traditional accounting data was generally **structured** and **human-generated.**
- **Technical problem**: hard to extract data from systems in a usable format. Auditors then had to consolidate the financial accounts for each and every client.

- Data has become **unstructured** and **machine-generated.**
- Now in auditing, **big data** can generate accounting information on a **real-time** basis

- **Big data** will make fraud detection **more effective** by **generating connections** between financial and non-financial information.

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Primary Benefits of Incorporating AI Into Forensic Audits

Reduction in staff-time and engagement timeline	AI platforms are capable of processing and analyzing far greater amounts of data within a significantly reduced timeline. This results in a reduction of staff-time allocated toward engagements which triggers cost-savings for both the accounting firm and the organization under audit. Additionally, AI can help reduce the time needed to identify the cause of the fraud, which can be critical in instances where the fraud is ongoing.
Machine Learning and Natural Language Processing technology	AI uses Natural Language Processing technology to identify key terms or performance indicators within contracts, administrative documents, financial reports, etc. Additionally, AI platforms are machine-learning technologies that allow organizations to tailor the systems to their organization using a set of sample documents. The systems will continue to learn as they are utilized and do not require specific programming.
Removal of human error	Since AI involves little human interaction in processing and analyzing sets of data, the risk of human error through clerical errors, typos in formulas or values, etc. is significantly reduced. Additionally, AI helps to identify anomalies or inconsistencies in data sets that may help to identify human errors.
Improved data analytics	Because AI is able to process a large amount of data, the platforms are also able to summarize data into user-friendly visuals to illustrate findings. This allows for more accurate, timely, and understandable data analytics.

AI IN TAXATION

- *Artificial intelligence can be used to compare pricing structures for more accurate transfer pricing.*
- *RPA can automate repetitive tasks.*
- *Machine learning can help classify tax-sensitive transactions.*
- *Machine learning can be used to analyse notices from tax regulators.*
- *Artificial intelligence can help identify possible deductions and tax credits.*
- *Artificial intelligence can make tax forecasting more accurate.*

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Typical AI consulting activities

- Strategy Formulation
- Training
- Implementation
- Commercial Due Diligence

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AI in Consultancy

1. **Impact on current process**: AI Technology will analyse massive amounts of data far more efficiently and faster than the average human, accurate insights into many areas of business including sales, operations, supply chain and more

2. Improvement: Streamline mundane processes with financial software which inturn leads to employee focusing on productive task which will enhance clients' ROIs

HOW IS AI CHANGING..

Financial institutions such as HSBC and Danske Bank are using it to get better at fighting money laundering and fraud

Mortgage lenders already use it to predict loan default rates

Vodafone, Nielsen and Unilever are using it to find job applicants with more fine-tuned social and emotional sensitivities

Airbus used it to design an interior partition on it's A320 jet-arriving at a structure that was scarcely half the weight of the previous version.

BMW and Mercedes-Benz are using AI - fueled collaborative robots, or "cobots" to turn their human car assemblers into "Ironman" superworks

Swiss investment bank USB teamed up with IBM Watson and a New Zealand startup to "digitally clone" it's chief economist Daniel Kalt so that the avatar Kalt cloud interact with clients just as he would in the flesh

MACHINE LEARNING

Machine learning provides predictions and prescriptions type of analytics (in order of increasing complexity)

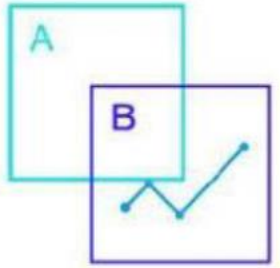
Descriptive

- Describe what happened
- Employed heavily across all industries

Predictive

- Anticipate what will happen (inherently Probabilistic)
- Employed in data-driven organizations as a key source of insight

Prescriptive



- Provide recommendatios on what to do to achieve goal
- Employed heavily by leading data and internet companies

Focus of machine learning

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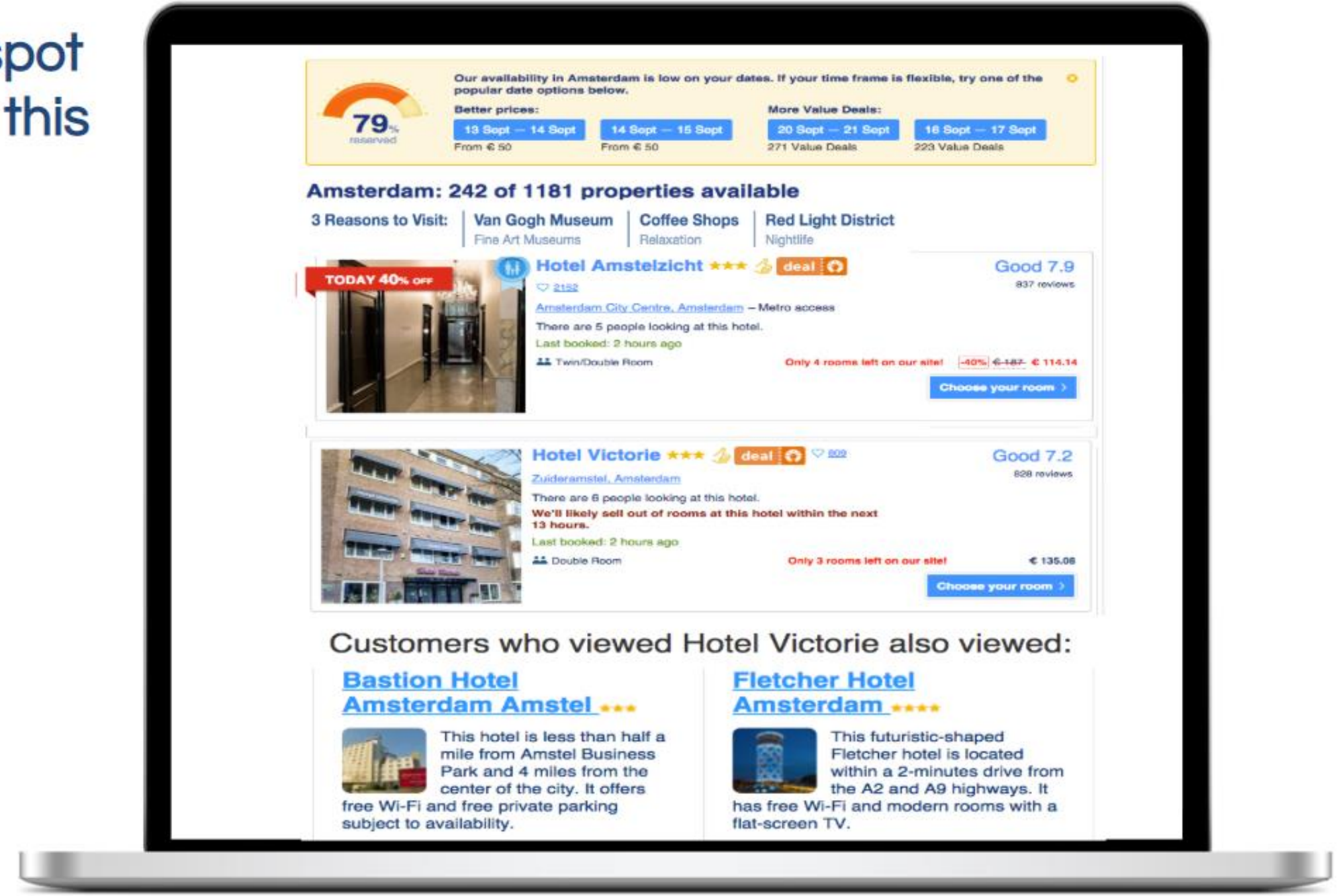
Can you spot any ML in this page?



BARRIERS TO ACHIEVE AI GOALS

- Lack of broad based expertise in research and application of AI
- Absence of enabling data ecosystems – access to intelligent data
- High resource cost and low awareness for adoption of AI
- Privacy and security, including a lack of formal regulations around anonymisation of data
- Absence of collaborative approach to adoption & application of AI
- Scanned Images are not readable
- Formats must be Constant
- 100% reliance not possible

SECRET TO AI SUCCESS

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- Getting your data prepared
- Understanding AI
- Find the right problems
- A well-structured programme

Create the ecosystem to train AI professionals

Start - ups can provide better solutions for AI projects

Block Chain Technology

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BLOCKCHAIN TIMELINE

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October 2008:
Bitcoin whitepaper by the nom-de-plume Satoshi Nakamoto is published.

May 2010:
First Bitcoin purchase: BTC 10k for a $25 pizza. Today BTC 10k is worth $10m! Bitcoin is known as the first use case of Blockchain technology.

June 2014:
LHV pank starts research on Blockchain and its digital security with their app "Cuber Wallet"

July 2014:
Ethereum Project - a Bl;ockchain platform with the ability to build decentralized applications - is funded by a crowd sale.

September 2015:
Major financial companies form R3 - a consortium of over 40 institutions committed to exploring and implementing Blockchain technology

September 2015:
Visa, Citi, Nasdaq Capital One and Fiserv invest $30m in the Blockchain startup Chain.com.

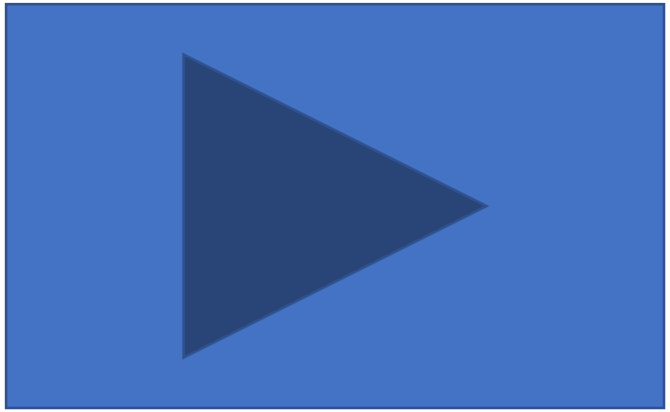
Chain

September 2016:
Over 40 financial service institutions have invested in a Blockchain or Bitcoin startup since 2014.

2018:
WEC estimates that 80% of all banks will initiate projects concering distributed ledger technology - the underlying technology supporting Blockchain.

WORLD ECONOMIC FORUM

What is Blockchain



The Dubai Blockchain Strategy

Will help Dubai achieve the vision of H.H. Sheikh Mohammed bin Rashid Al Maktoum by making "Dubai [will be] the first city fully powered by Blockchain by 2020" and make Dubai the happiest city on earth. The strategy will be using 3 strategic pillars Government Efficiency, Industry Creation, and International Leadership.

Launched by His Highness Sheikh Hamdan, the Dubai Blockchain Strategy, is a result of a collaboration between the Smart Dubai Office and the Dubai Future Foundation to continually explore and evaluate the latest technology innovations that demonstrate an opportunity to deliver more seamless, safe, efficient, and impactful city experiences.

Blockchain technology is a new, powerful tool that is already shaping the future of the Internet with simple, safe and secure transactions.

The Dubai Blockchain Strategy will help Dubai achieve the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, to create the future of Dubai, and make Dubai the happiest city on earth.

"Adopting Blockchain technology Dubai stands to **unlock 5.5 billion dirham in savings annually in document processing alone** — equal to the one Burj Khalifa's worth of value every year." The Dubai Blockchain Strategy establishes a roadmap for the introduction of Blockchain technology for Dubai and the creation of an open platform to share the technology with cities across the globe.

Source: https://smartdubai.ae/initiatives/blockchain

Singapore banks using blockchain for AML

Author: Karry Lai | Published: 28 Mar 2018

The Singapore government is exploring the possibility of using blockchain and distributed ledger technology (DLT) for faster and more efficient clearing and settlement in trade finance, payments, and securities, but also combat money laundering (AML) and terrorism financing (CFT).

The Monetary Authority of Singapore (MAS) launched **Project Ubin in 2016 with a consortium of banks to develop software for decentralised interbank payments and settlement**.
It has since released source code to the public.

The Singapore Infocomm Media Development Authority has also developed a know your customer (KYC) blockchain in cooperation with a group of banks.

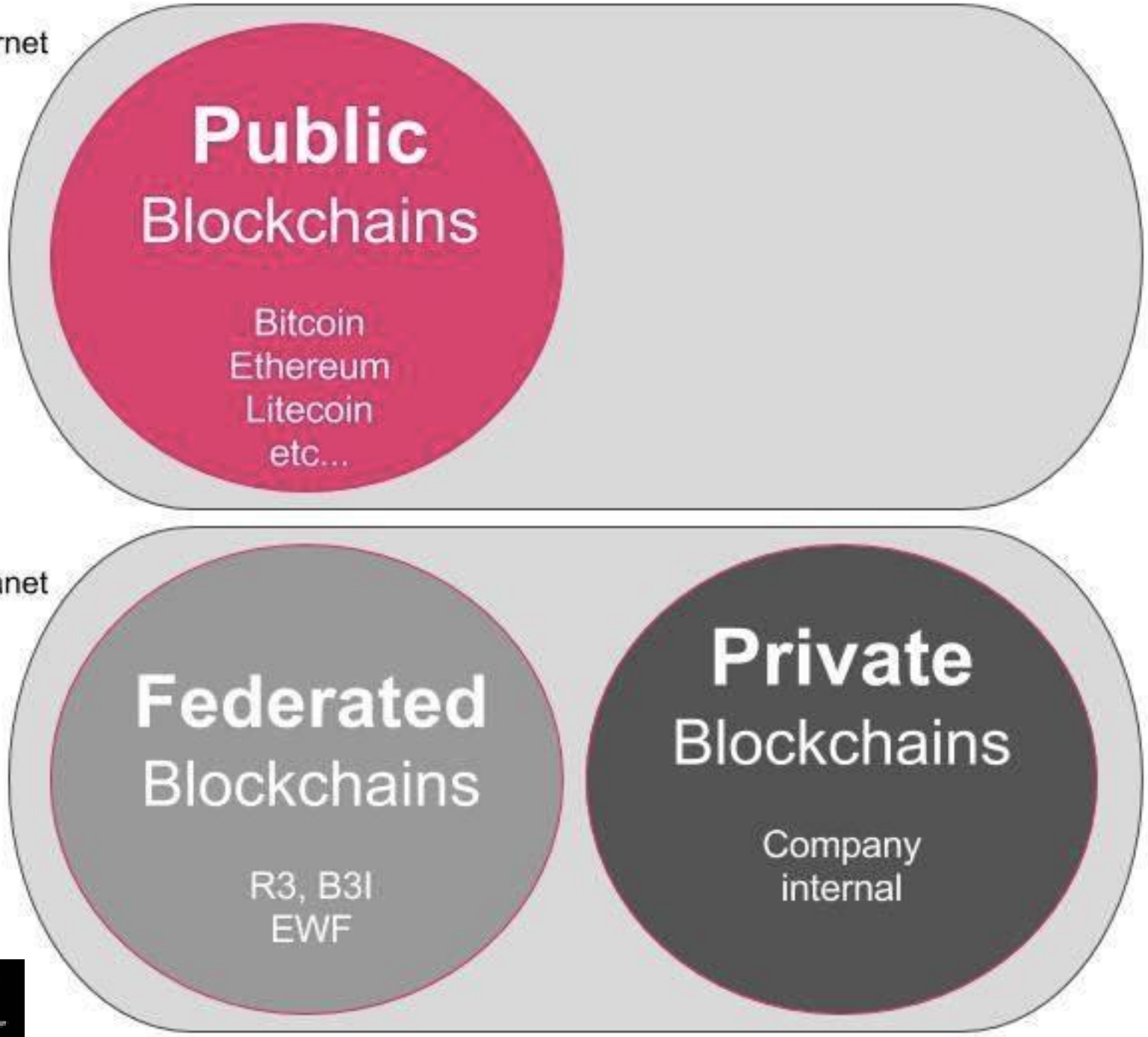
Some individual banks have also partnered with outside providers to develop their own blockchain and artificial intelligence solutions, particularly in the area of AML compliance.

International applicability

One of the areas that require more work still is crossborder application.

Source: http://www.iflr.com/Article/3797136/Singapore-banks-using-blockchain-for-AML.html

Equivalent to Internet in 1990ies?



Equivalent to Intranet in 1990ies?

Distributed Ledger Technologies?

Internet of Blockchains?

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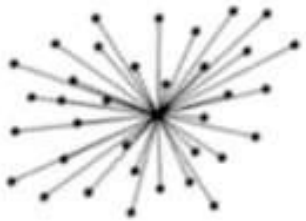
Blockchain Permission Levels

Traditional ledger

- Centralized
- Only owner can R/W the ledger and not immutable record
- Reconciliation must be done with other ledgers to settle transactions

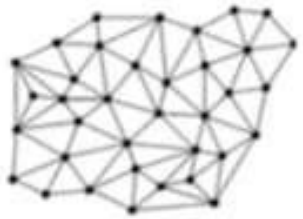


Permissioned Private Ledger

- Decentralised
- Only permissioned entities may R/W the ledg

Unpermissioned Public Ledger

- Distributed
- Anyone can R/W ledger as long as follow certain rules



Permissioned Public Ledger

- Decentralised
- Only permissioned entities may write the ledger
- Anyone may view ledger contents

ripple

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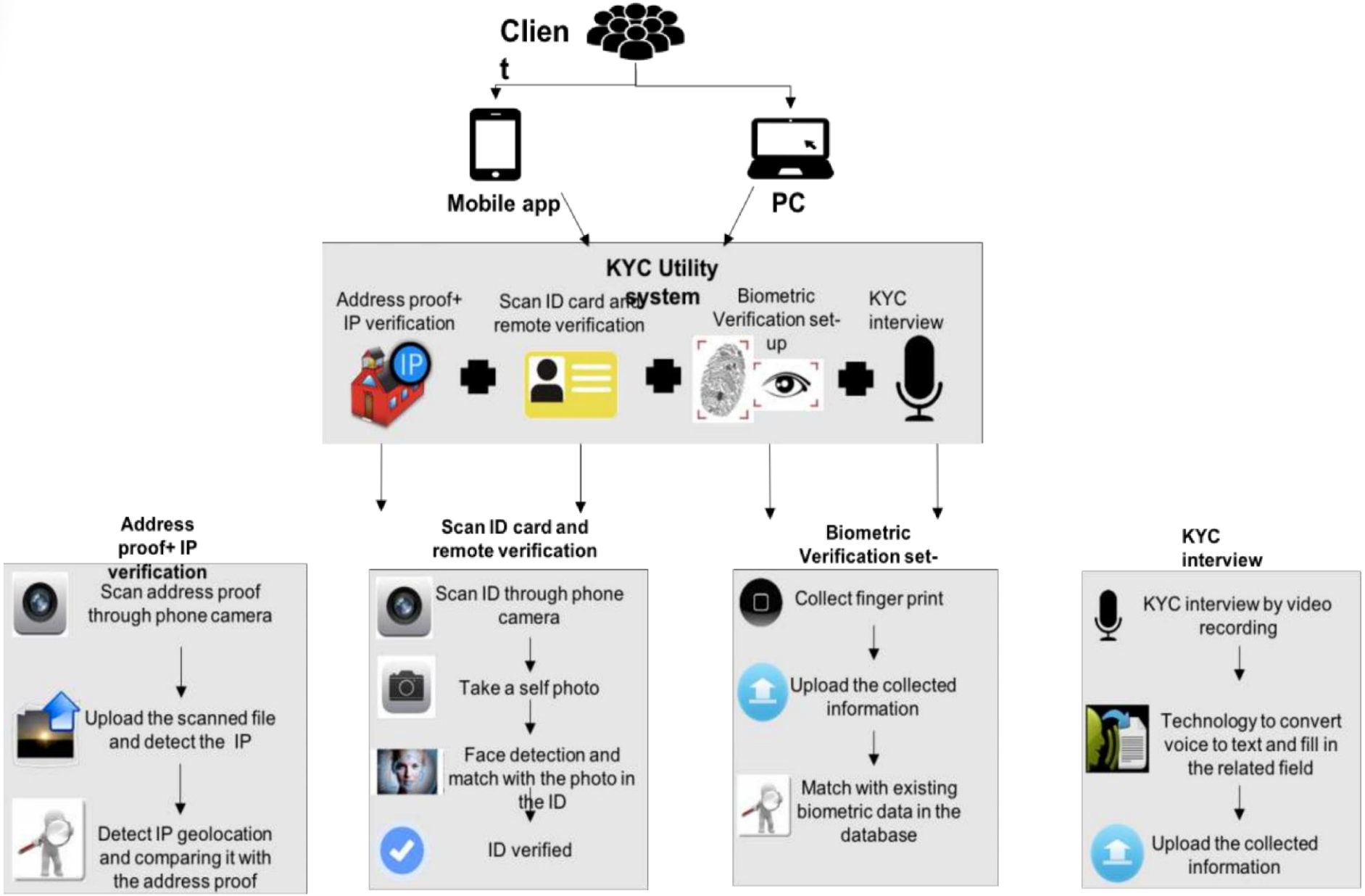

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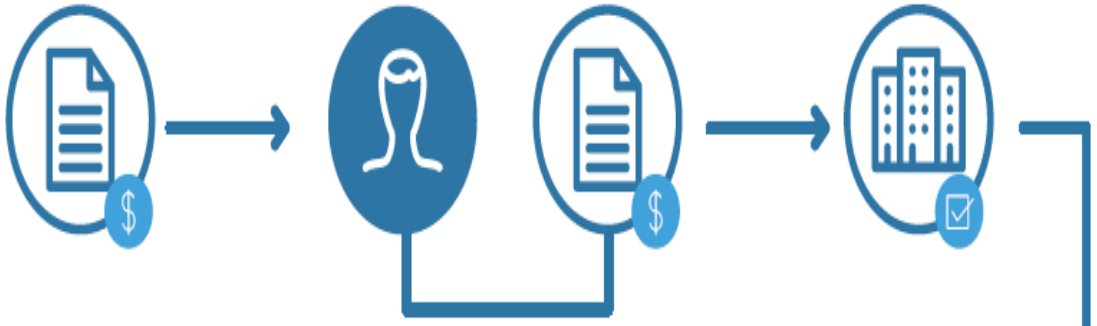
How a VAT transaction is processed without Blockchain

1. A VAT invoice is issued by the company
2. The Client pays the bill, including VAT
3. Information about the payment is recorded into the Company's system



4. The company pays their suppliers bill ex by bank transfer
5. The company calculates VAT due to the tax authorities and fillsat a taxreturn (quarterly, monthly, yearly)

How could VAT be processed using Blockchain

1. The client pays the invoice to the company
2. The company pays the suppliers invoice

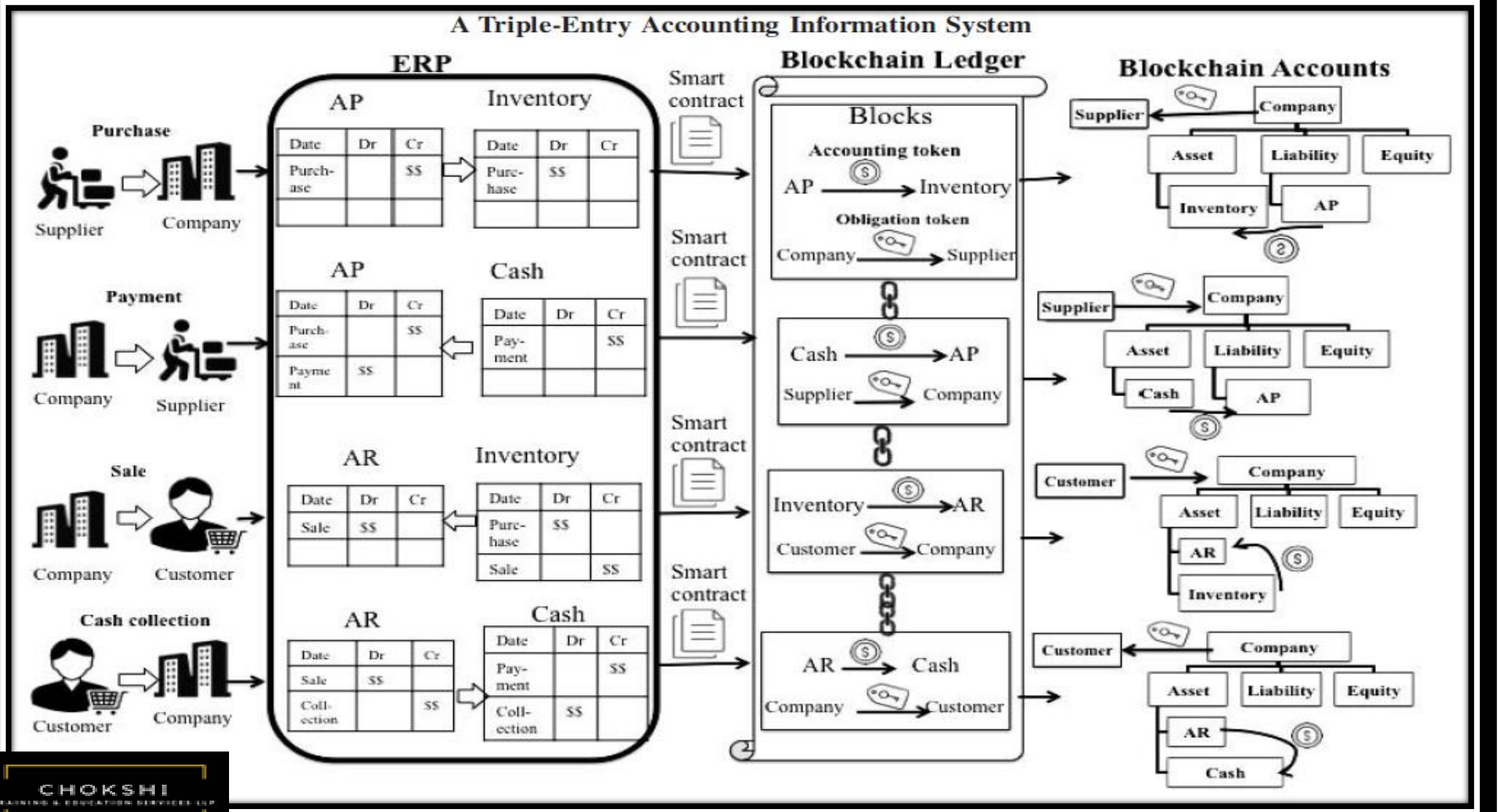
- At the same time, Blockchain smart contracts calculate the invoice VAT and divides it into the non-VAT and VAT part.
- The VAT is paid directly to the tax authority by smart contract.
- The non-VAT part is transferred to the company's account using a smart contract.

This is done via a smart contract:

- The company fills in the needed amount and the smart contract performs the payments.

Simultaneously:

- The amount due is sent to the supplier.
- The smart contract calculates VAT and sends it to the tax authorities



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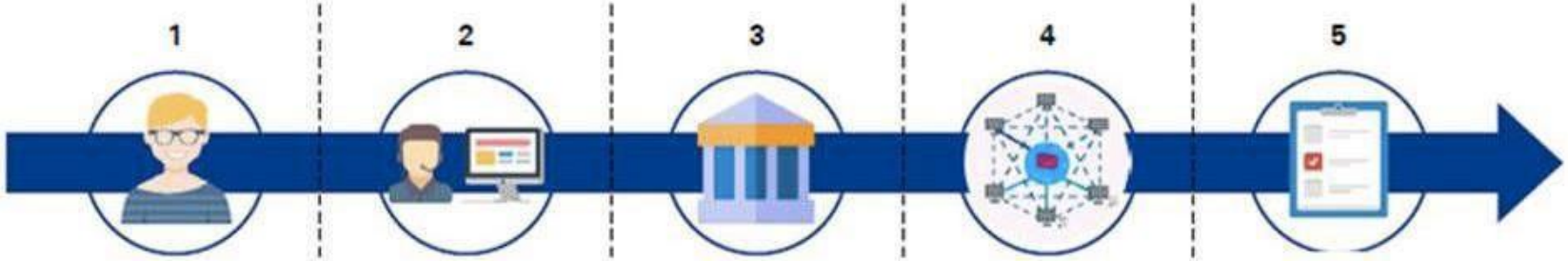
Are Auditors Required then?



Customer approaches bank

An individual or corporate customer approaches a bank to open an account.

Bank queries the shared KYC platform

With the customer's consent, bank staff can extract relevant information from the shared KYC platform.

Validates with trusted sources

Customer information extracted from the shared KYC platform is validated with government registries, tax authorities, and credit bureaus.

Updates on shared KYC platform

New customer information from the validation process is updated on the shared KYC platform.

Completes the KYC process

The KYC process is completed. Banks can store a record of the validation process and results for regulatory reporting.

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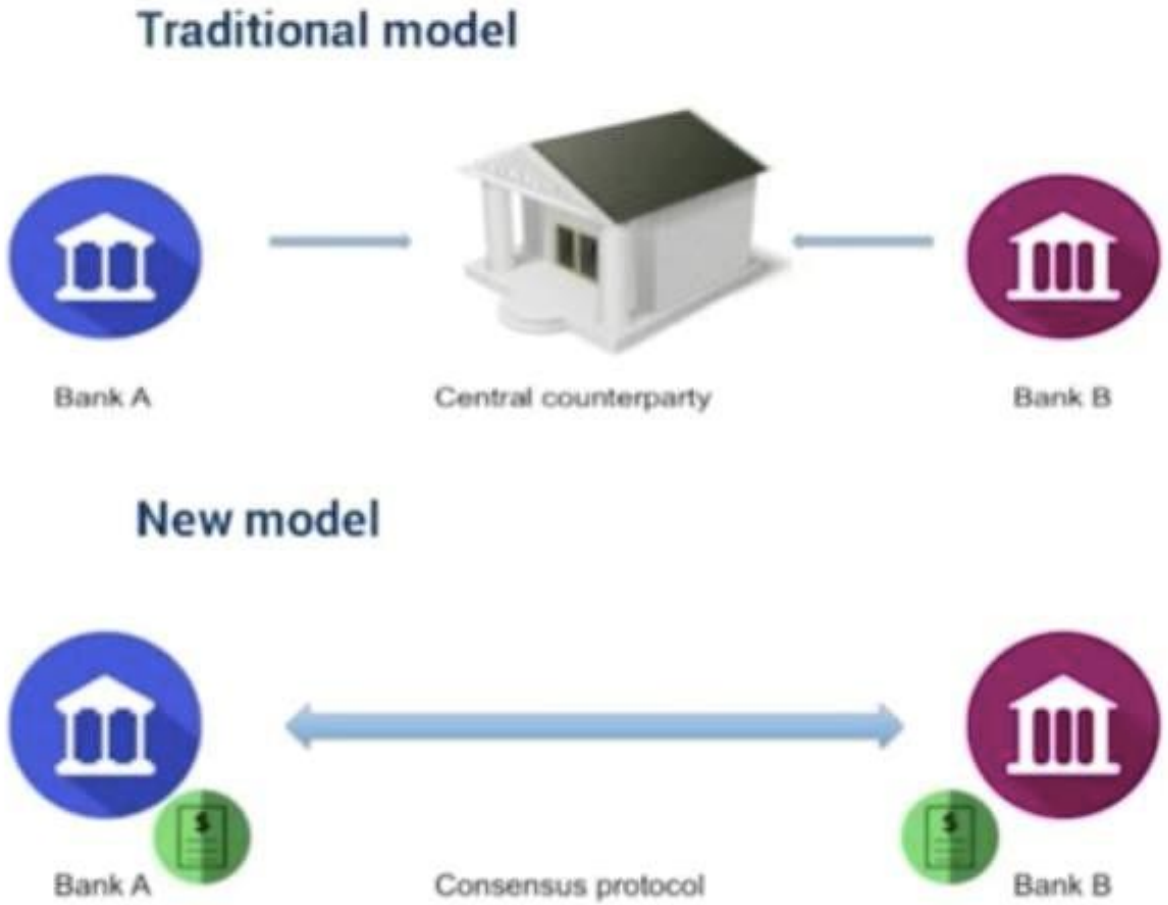
Interbank Payments



Swift Messaging

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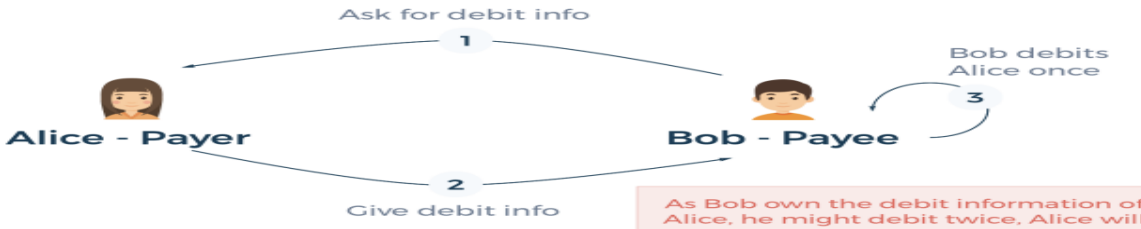
PAYMENT

When you get debited by the seller

ex: credit card on amazon

expensive & not secure

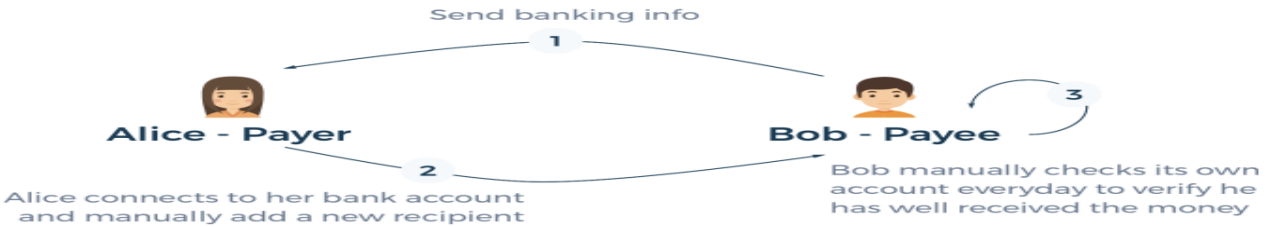


As Bob own the debit information of Alice, he might debit twice, Alice will have to be careful.

When you have to transfer to the seller

ex: You receive an invoice with wire instruction

complex



mistakes might be made

When you get debited by a third party

ex: using paypal on a marketplace

expensive & not secure

BEFORE

AFTER

Scenarios – Applied Block chain

Financial Services	Capital Markets	Payments	Others
KYC	FX	Remittance	Proof of Ownership
AML	Repo	Interbank Payment	Title Protection
E-Identity	Private Stocks	P2P Money Transfer	Legal Inheritance
Marketplace	Letter of Credit	Letter of Credit	Cyber Security
Asset Transfer	Bilateral Trade	Cross Border Payments	Patient Health Records
Regulatory Reporting			

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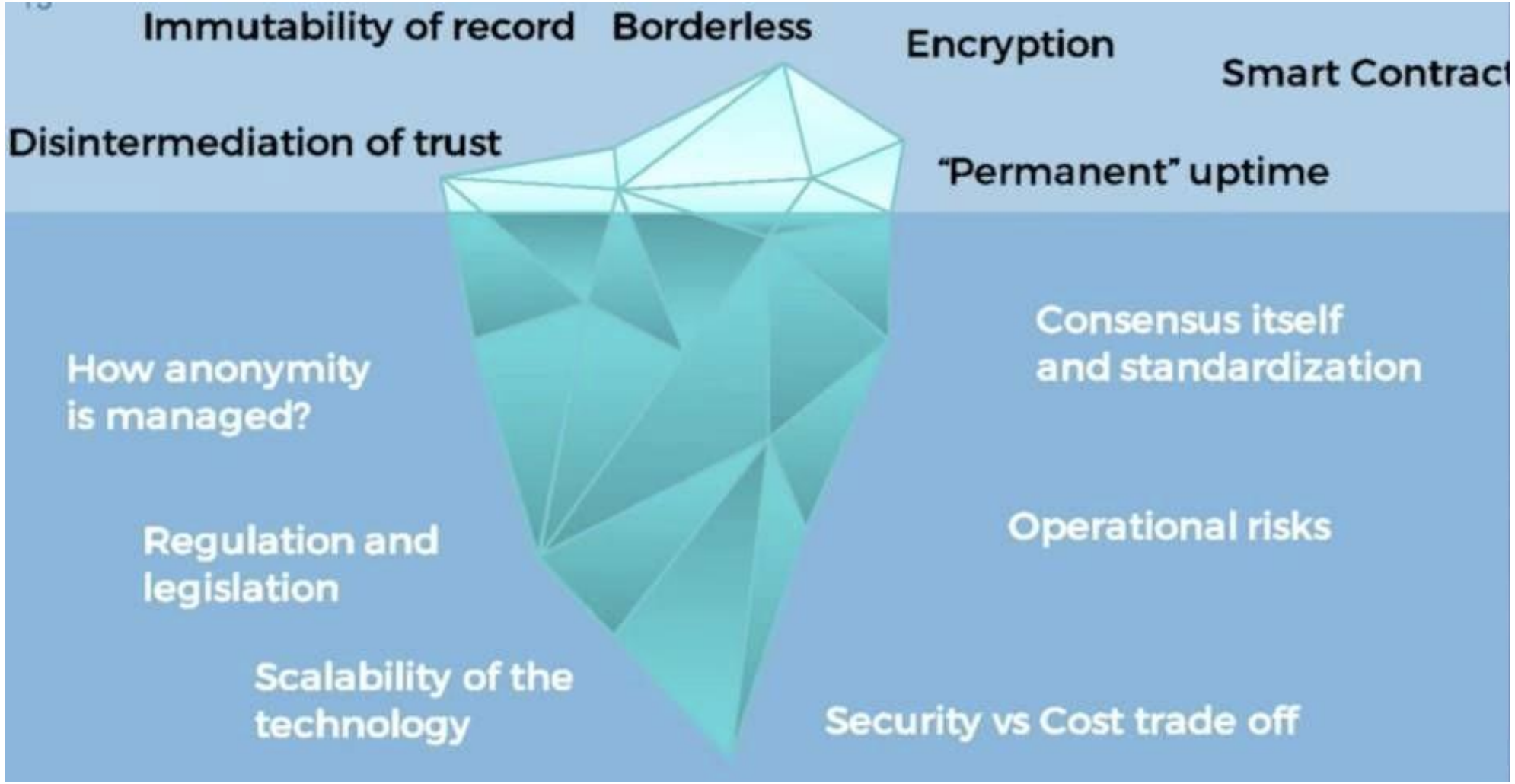
Accounting, Tax and legal aspects arising therefrom



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Singapore Dollar and Bitcoin the Same Under AML/CFT Laws: Deputy PM

BITCOIN REGULATION JANUARY 09, 2018 13:43 CET

Singaporean laws do not make any distinction between transactions involving fiat currencies and cryptocurrencies like bitcoin under money laundering and counter-terrorism financing laws, the country's deputy prime minister said yesterday. Tharman Shanmugaratnam, Singapore's deputy prime minister and minister in charge of the central bank, was speaking at a parliamentary session on Monday when he was asked by MP Foo Mee Har about how authorities could enforce anti-money laundering laws and counter- financing of terrorism (AML/CFT) laws on cryptocurrency transactions with a specific focus on bitcoin.

What are the 'levers' available, she asked, to the Monetary Authority of Singapore (MAS) and law enforcement agencies to enforce AML/CFL financing laws for bitcoin transactions where conventional regulatory oversight of traditional markets do not apply. In response, the deputy prime minister stated in no uncertain terms:

"When it comes to money laundering or terrorism financing, Singapore's laws do not make any distinction between transactions effected using fiat currency, virtual currency or other novel ways of transmitting value… Hence, MAS' AML/CFT requirements apply to all activities of financial institutions, whether conducted in fiat or virtual currencies."

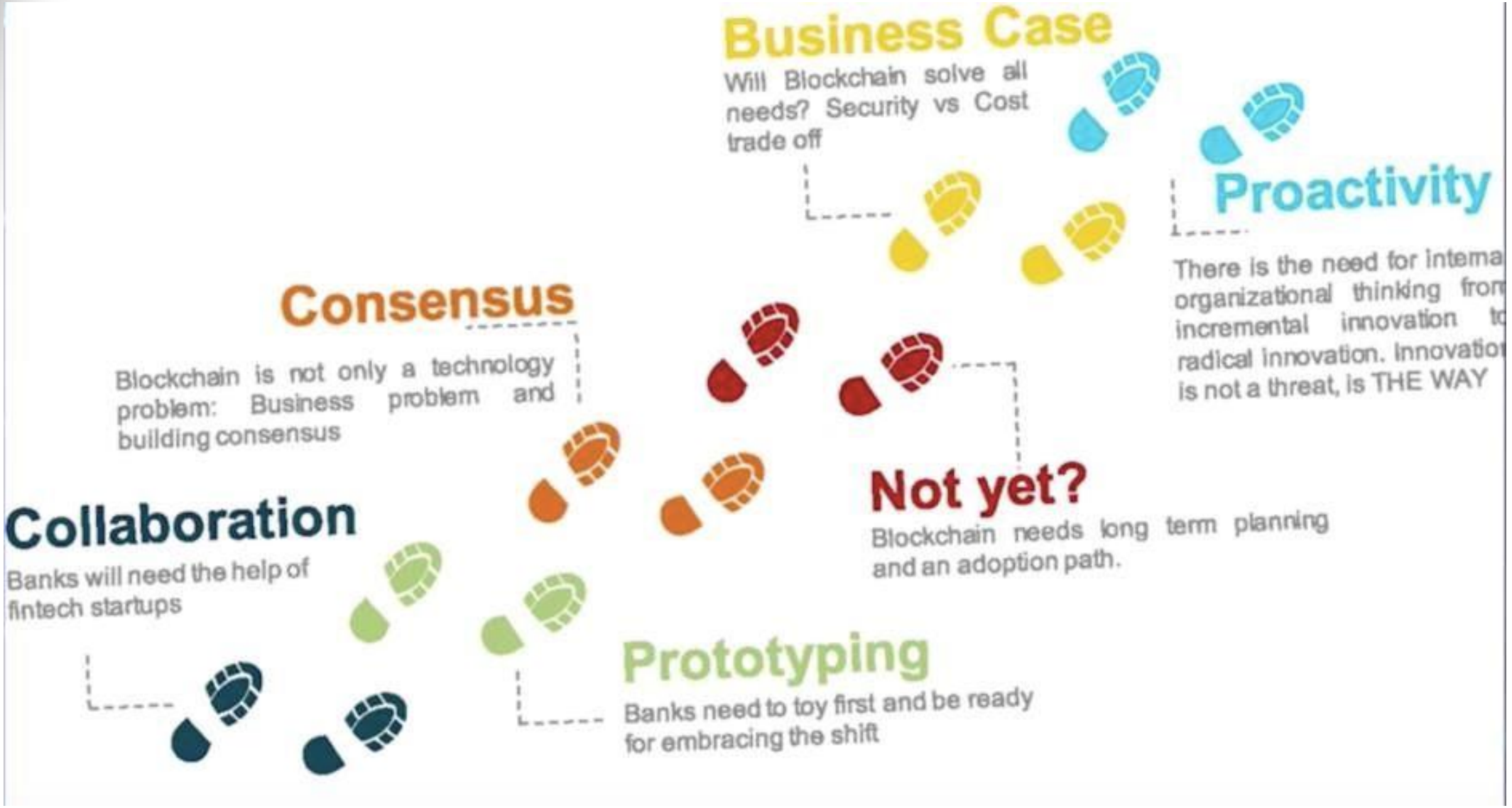
Despite issuing a recent caution to investors getting into cryptocurrencies, Singapore's central bank is pressing ahead with regulation that will bring a number of retail payment services, including bitcoin and cryptocurrency exchanges, under the singular regulation of its Payment Services Bill. Under the regulatory framework, all payment services will be overseen in a single legislation wherein t he authority will have oversight into cryptocurrency exchanges and bitcoin trading platforms. The second public consultation of framework came to an end on Monday. Shanmugaratnam referenced the bill in his response , confirming the central bank's intention to impose and mandate AML/CFT requirements on intermediaries. "[A]t some stage, fiat currency will have to be exchanged for virtual currency, or vice versa, at intermediaries that sell or exchange virtual currency," the official said.

Finally, the deputy prime minister stressed that the "still evolving" virtual currency space is being watched closely by the MAS as it determines a balanced approach that fosters innovation in the space.

He stated: **"Like most innovations, it presents new opportunities as well as risks. MAS is closely watching these developments and studying the approaches taken in other jurisdictions. The basic idea is for our policies and rules to foster innovation while mitigating risks, including from ML/TF. "**

Source: https://www.ccn.com/singapore-dollar-bitcoin-aml-cft-laws-deputy-pm/

Benefits v/s current systems usage



FUTURE ROLES OF A CA IN THE BLOCK CHAIN ECOSYSTEM

- *Arbitration Function*
- *Auditor of Smart Contracts and Oracles*
- *Service Auditor of Consortium Block chains*
- *Administrator Function*

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Thank You
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