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
“Data is the new oil, Analytics is the Refinery, and Intelligence is the Gasoline which drives growth.”

@Tiffani Bova
Pre-Built, Secure System

Data Ingestion

Data Transformation

Data Modeling

Results Visualization

50+ Connectors

On Premises & On Cloud

Business Insights

Customer Journey

Cross sell / Up sell

Anomaly Detection

Social Analytics
What is Artificial Intelligence
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

LEADING SECTOR
- Financial services
- High tech & telecommunications
- Automotive & assembly
- Energy & resources
- Media & entertainment
- Transportation & logistics
- Health care
- Professional services
- Retail
- Consumer packaged good
- Education
- Construction

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

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
- Cognitive Robotics
- Speech Analytics
- Recommendation Systems
- Data Visualization
EVA - SMART CHAT BOX

GOOGLE ASSISTANT

AMAZON ECHO

TESLA – SELF DRIVING
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.
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 AUDITUDE

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 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.

What can we do now

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

What can we do in the future

- Big data will make fraud detection **more effective** by generating connections between financial and non-financial information.
<table>
<thead>
<tr>
<th>Primary Benefits of Incorporating AI Into Forensic Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in staff-time and engagement timeline</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Machine Learning and Natural Language Processing technology</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Removal of human error</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Improved data analytics</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>
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.
Typical AI consulting activities

- Strategy Formulation
- Training
- Implementation
- Commercial Due Diligence
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 in turn leads to employee focusing on productive task which will enhance clients’ ROIs
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 its 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" its chief economist Daniel Kalt so that the avatar Kalt cloud interact with clients just as he would in the flesh.
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 recommendations on what to do to achieve goal
  - Employed heavily by leading data and internet companies

Focus of machine learning
Can you spot any ML in this page?

Amsterdam: 242 of 1181 properties available

3 Reasons to Visit:
- Van Gogh Museum
- Coffee Shops
- Red Light District

Hotel Amstelzicht
- Today 40% off
- Amsterdam City Centre, Amsterdam – Metro access
- There are 5 people looking at this hotel.
- Last booked: 2 days ago
- Twin/Double Room
- Only 4 rooms left on our site

Hotel Victorie
- 3 people looking at this hotel.
- Amsterdam City Centre, Amsterdam
- We'll likely sell out of rooms at this hotel within the next 13 hours.
- Last booked: 2 days ago
- Double Room
- Only 3 rooms left on our site

Customers who viewed Hotel Victorie also viewed:

Bastion Hotel Amsterdam Amstel
- This hotel is less than half a mile from Amstel Business Park and 4 miles from the center of the city. It offers free Wi-Fi and free private parking subject to availability.

Fletcher Hotel Amsterdam
- This futuristic-shaped Fletcher hotel is located within a 2-minute drive from the A2 and A9 highways. It has free Wi-Fi and modern rooms with a flat-screen TV.

Good 7.9

Good 7.2

937 reviews

920 reviews
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

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
**Blockchain Timeline**

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

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

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

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

**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.

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

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

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

Public Blockchains
- Bitcoin
- Ethereum
- Litecoin
- etc...

Federated Blockchains
- R3, B3I
- EWF

Private Blockchains
- Company internal

Equivalent to Internet in 1990ies?

Equivalent to Intranet in 1990ies?

Distributed Ledger Technologies?

Internet of Blockchains?
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 ledger

**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
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 except by bank transfer
5. The company calculates VAT due to the tax authorities and fills a tax return (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.

This is done via a smart contract:
- The company fills in the needed amount and the smart contract performs the payments.
- The non-VAT part is transferred to the company’s account using a smart contract.
- The amount due is sent to the supplier.
- The smart contract calculates VAT and sends it to the tax authorities.
Are Auditors Required then?
1. Customer approaches bank: An individual or corporate customer approaches a bank to open an account.

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

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

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

5. Completes the KYC process: The KYC process is completed. Banks can store a record of the validation process and results for regulatory reporting.
Interbank Payments

**Traditional model**

- Bank A
- Central counterparty
- Bank B

**New model**

- Bank A
- Consensus protocol
- Bank B

Swift Messaging
PAYMENT

When you get debited by the seller
ex: credit card on amazon

1. Ask for debit info
2. Give debit info

Alice - Payer
Bob - Payee

expensive & not secure

Bob debits Alice once

As Bob owns 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

1. Send banking info
2. Alice connects to her bank account and manually adds a new recipient
3. Bob manually checks its own account everyday to verify he has well received the money

Alice - Payer
Bob - Payee

complex

mistakes might be made

When you get debited by a third party
ex: using paypal on a marketplace

1. Ask for payment
2. Ask for debit info
3. Debit
4. Third party

Alice - Payer
Bob - Payee

expensive & not secure

5. Credit

BEFORE

AFTER

2. Detect & pay the request
1. Create a request
3. Get paid

Bob - Payee
Scenarios – Applied Block chain

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</tbody>
</table>
Accounting, Tax and legal aspects arising therefrom
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 the 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

- **Consensus**: Blockchain is not only a technology problem; Business problem and building consensus.
- **Collaboration**: Banks will need the help of fintech startups.
- **Business Case**: Will Blockchain solve all needs? Security vs Cost trade off.
- **Proactivity**: There is the need for internal organizational thinking from incremental innovation to radical innovation. Innovation is not a threat; is THE WAY.
- **Not yet?**: Blockchain needs long term planning and an adoption path.
- **Prototyping**: Banks need to toy first and be ready for embracing the shift.
FUTURE ROLES OF A CA IN THE BLOCK CHAIN ECOSYSTEM

- Arbitration Function
- Auditor of Smart Contracts and Oracles
- Service Auditor of Consortium Blockchains
- Administrator Function