

Why the need for AI?

By Gerard Rafie

The Financial Ecosystem under crisis

Major type of AI used today

How can I use AI?

AI limitations & risks

29 October 2018

First let us understand the financial ecosystem,
the banking industry and the challenges

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The financial ecosystem under deluge of data

\$200 B spent on managing data by 2020
 ~ 15 to 20% by the global Financial segment
 ~\$40 B

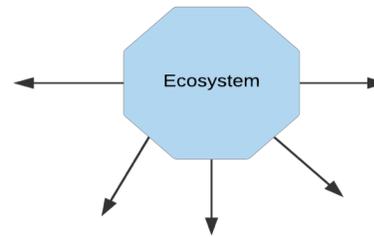
with a growth potential of 10-20% per year

This is only in developed countries
 (source JP Morgan Chase)



- Buy-Side
- Hedge-Fund
- Asset-Management
- Pension-Fund
- Insurance
- Fund-Admin

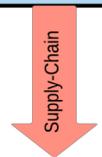
- Sell-Side
- Monster
- Global
- Regional
- Local
- Private



- Investment Banking
 - Treasury
 - Corporate Banking
 - Retail
 - Wealth Management
 - Brokers-Dealers
- Capital-Market
- Corporate Finance

OTHER

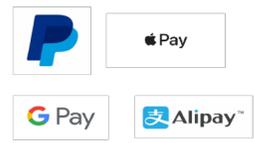
- Central-Bank
- World-Bank
- Regulators
- Custodians
- Exchanges
- Corporate Treasury
- Peer-to-Peer loan provider
- Private-Finance Planning
- Private Investors



- Database Providers
- Cloud Providers
- Liquidity-Hubs
- S/W Solutions
- Hosting
- H/W Providers
- Library Providers
- Data Providers

last but not least

- Consulting
- Services



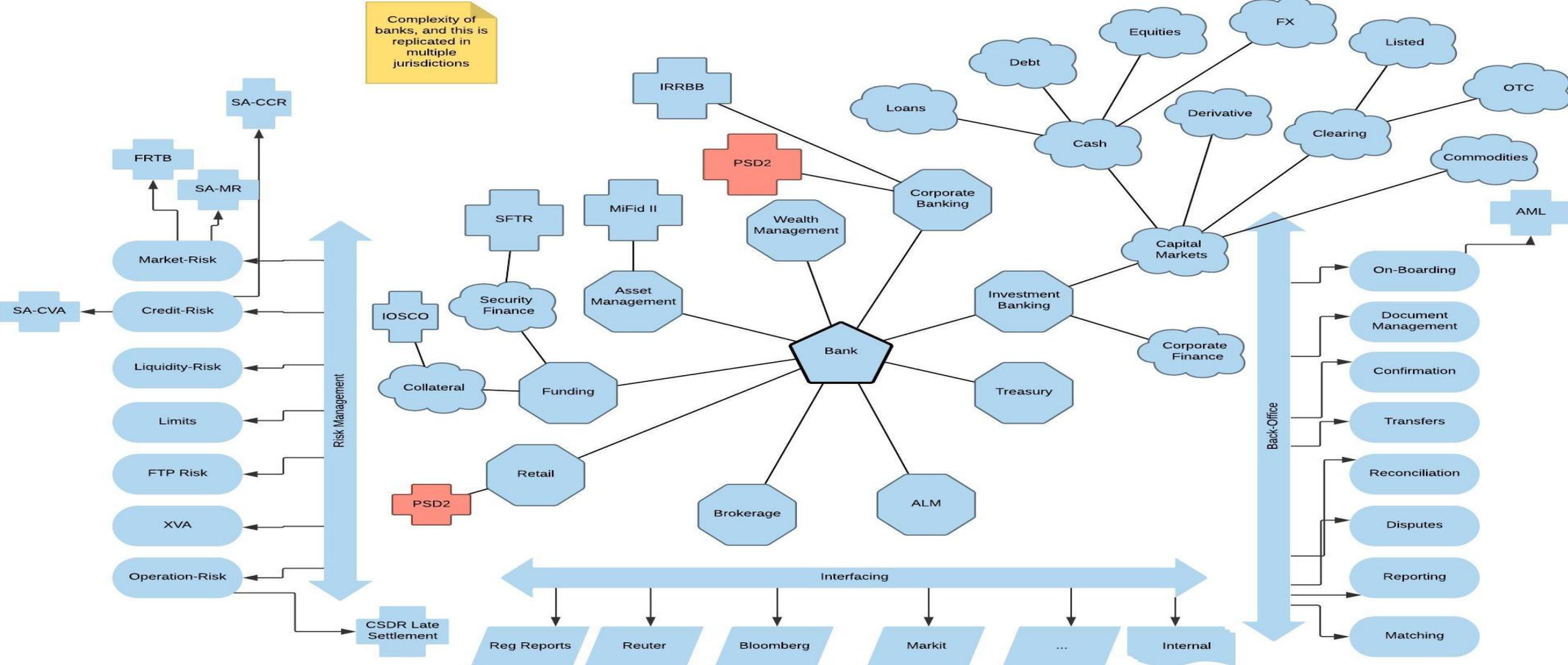
Example of ecosystem – Courtesy Fintekminds LLC

- The banking and financial sectors are going through fundamental structural changes. Compliance regulations have kept these industries trapped in long-overdue legacy complex systems
- Bank's executives understood 2 things:
 - Data is the new **Eldorado** in the years to come & **AI** is the road to take you there
 - They need urgently to make a shift towards integrating more technology into their daily operations
- This is due to the pressure posed by Fintech start-ups on traditional banks and a sharp decline in the latter's credibility among the new generation
- Whatever technological decision a bank is taking, it is always motivated by:

Cost and Efficiency

Example of a complexity in banks' operations

Investment Bank



- Regulations added to the bank's operations complexity & cost
- Every department is responsible of managing large amounts of data for different purposes
- Departments do not talk to each others
 - Duplication of data and work
 - No adequate tools
- Inefficiency is almost everywhere

Did you think regulation is over?

Think twice

Further enhancements of the Basel framework („Basel IV“)

Regulatory Capital

Own Funds	Common Equity Tier 1	Additional Tier 1	Tier 2	TLAC/MREL (BCBS 342, FSB, BRRD)	Eligible Liabilities	Concept	Calibration	TLAC	MREL	Eligible instruments
<ul style="list-style-type: none"> Common Equity Tier 1 Additional Tier 1 Tier 2 	<ul style="list-style-type: none"> Common Equity Tier 1 Additional Tier 1 Tier 2 	<ul style="list-style-type: none"> Common Equity Tier 1 Additional Tier 1 Tier 2 	<ul style="list-style-type: none"> Common Equity Tier 1 Additional Tier 1 Tier 2 	<ul style="list-style-type: none"> TLAC/MREL (BCBS 342, FSB, BRRD) 	<ul style="list-style-type: none"> Eligible Liabilities 	<ul style="list-style-type: none"> Concept 	<ul style="list-style-type: none"> Calibration 	<ul style="list-style-type: none"> TLAC 	<ul style="list-style-type: none"> MREL 	<ul style="list-style-type: none"> Eligible instruments

Capital Requirements

Capital Floors (BCBS 306, 362) Two alternatives possible: Risk-category based floor or overall floor

Max (Capital Requirements_{CR}; Capital Requirements_{CA}) x floor factor

Credit Risk



Investments in funds (BCBS 296)



Trading-book definition (BCBS 302)



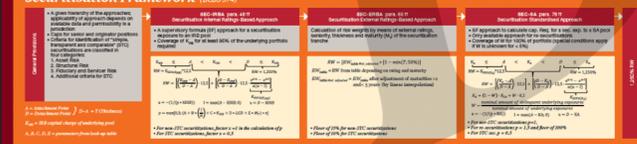
RWA under Standardised Approach (BCBS 347)

Category	AAA to A-	A to A-	BBB to BB-	BB to B-	Other	Operational risk	Other
Corporate	35%	50%	100%	150%	150%	12.5%	100%
Bank	35%	50%	100%	150%	150%	12.5%	100%
Residential mortgage	35%	50%	100%	150%	150%	12.5%	100%
Commercial mortgage	35%	50%	100%	150%	150%	12.5%	100%
Equity	35%	50%	100%	150%	150%	12.5%	100%
Other	35%	50%	100%	150%	150%	12.5%	100%

RWA under IRB-Approach (BCBS 362)

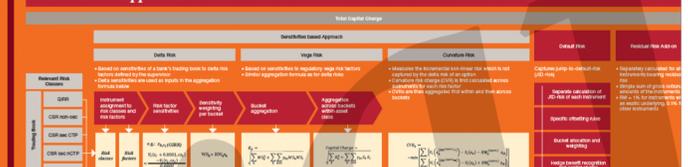


Securitisation Framework (BCBS 374)

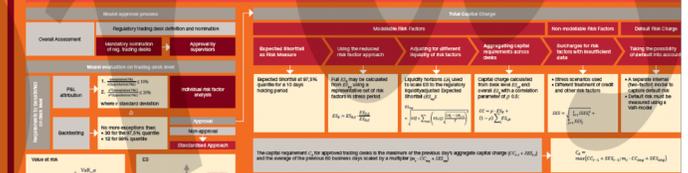


Market Risk (BCBS 302)

Standardised Approach



Internal Models Approach



Disclosure (BCBS 306, 362)

Category	Risk management, key performance indicators and risk appetite	Large exposures and related concentrations	Composition of capital and TLAC	Composition of capital and TLAC	Monitored supervisory measures	Liquidity	Credit Risk	Contingency credit risk
Qualitative	<ul style="list-style-type: none"> Qualitative Qualitative Qualitative 							
Quantitative	<ul style="list-style-type: none"> Quantitative Quantitative Quantitative 							

Date: September 2016

Global Basel IV Leader: Martin Nielsen

For further information or your national PwC contacts please visit: www.pwc.de/basel-iv-international-contacts

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Who's next after Investment Banks

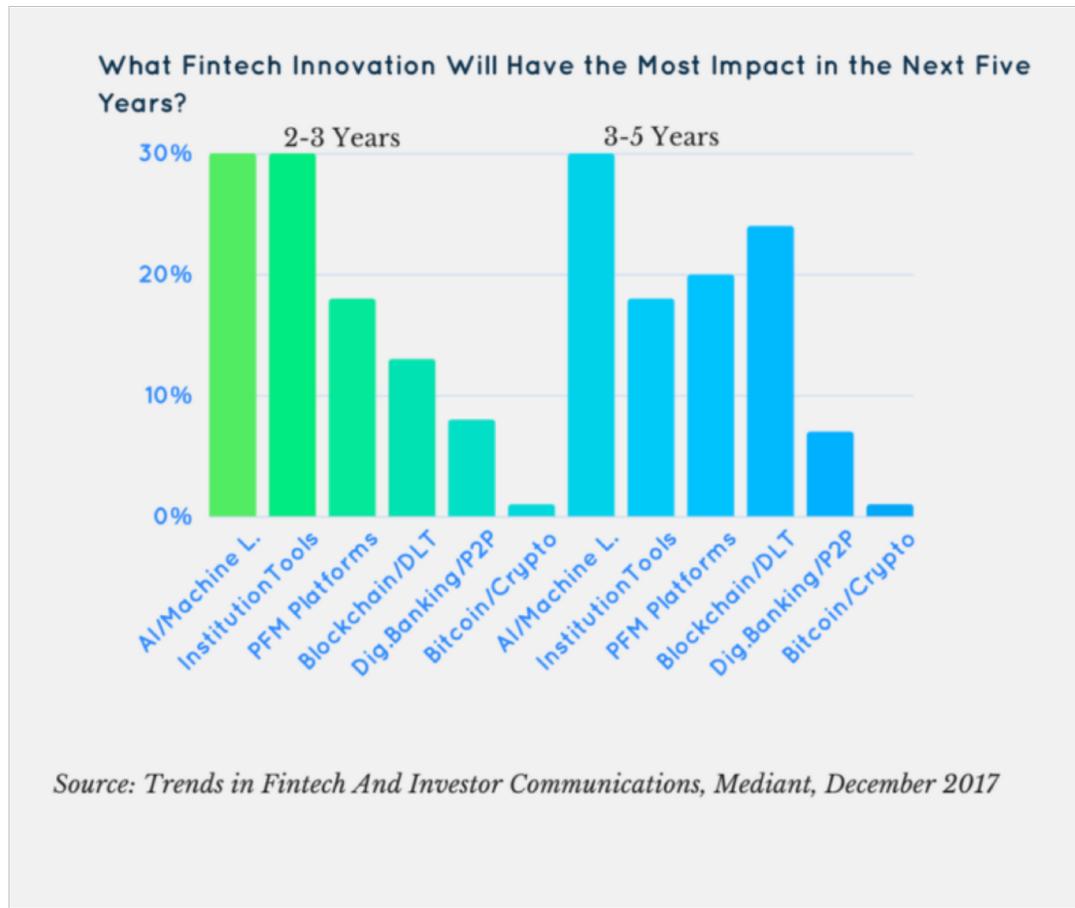
- Regulators are turning their attention towards:
 - The Buy-Side (MiFID II)
 - Corporate-Banking (PSD2)
- These two will follow the same difficult path as the Investment Banks

Will they learn from the Investment Banks?

- Read: <https://www.fintekminds.com/single-post/2018/01/08/Buy-Side-Fintech-Challenges>

The magic wand?

[According to Gartner](#), by the end of 2020, 20% of citizens in developed nations will use AI for everyday operational tasks and a whopping 85% of CIOs (Chief Information Officers) will be piloting AI programs for their organizations through buy, build and outsourcing efforts.



Why we are talking about AI now

- What changed from 10 years ago:
 - AI existed long time ago (clustering, regression analysis,...) but the inflexion point was the : **CLOUD**
 - Proliferation of Data : **Cloud**
 - Processing Power: **Cloud**
 - Data Storage: **Cloud**
 - Accessibility : **Cloud**
 - Democratization of AI tools
 - The speed of innovation
- Why AI is is more interesting than conventional software:
 - AI can:
 - Learn independently
 - Make autonomous decisions
 - Evolve without Human Intervention

What type of AI are we talking about

There is no ONE SIZE FITS ALL

- Mimicking the human brain ([Deep learning method and Deep neural network](#))
- Visually processing information like a human brain ([Capsule Neural Networks](#))
- A neural network that learns by interacting with the environment ([Deep Reinforcement Learning](#))
- Pairing opposing neural nets to enhance learning and lighten the processing load ([Generative Adversarial Networks](#)).
- The ability to learn through synthesized data where real historic data is not available ([Augmented Data Learning](#))
- Enabling non-programmers to develop machine learning models ([Automated Machine Learning or AutoML](#))
- A virtual model that can analyze and monitor physical or psychological systems, like predicting customer behavior ([Digital Twin](#))
- AI that is transparent and provides reasoning behind the recommendations made by it as opposed to "Black Box" AI that doesn't provide reasoning ([Explainable AI](#))

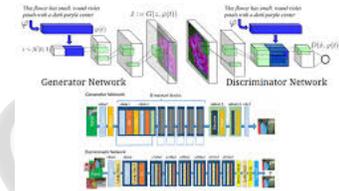
Machine Learning/Deep Learning



- **Financial Predictions and Deep Insights:**

- Machine learning empowers algorithms to learn. As long as the inputs are **high-quality, clean, and relevant**, the results can create scenarios, build portfolios and anticipate future trends accurately.
 - Credit rating
 - Stock picking and strategy building (sentiments analysis)
 - Portfolio Balancing
 - Process Workflow Optimization
 - Risk Simulation Optimization
- Read: <https://www.fintekminds.com/single-post/2018/02/17/Will-Machine-Learning-disrupt-soon-Capital-Markets-Definitely-YES>

Generative Adversarial Networks



- **Early detection and prevention of cyber-security threats**

- The role of a deep learning algorithm is to go over numerous transactions and try to identify the patterns behind those that were confirmed as frauds.
 - Using Generative Adversarial Networks (GANs), fintech companies can build robust security systems into their solutions.
 - It can visually identify customers and documents in account creation, loan and insurance origination and documentation
 - It can help satisfy regulatory compliance such as FATCA, OFAC, 4AMLD, MAS guidelines etc.

Chatbots



- Both start-ups and banks are creating and deploying chatbots to consolidate their relationship with clients and to free their staff's time
- Next generation of **Humanoid Chatbots** combined with augmented reality to appear more human (avatar) are used to shorten the training period in the banking industry.

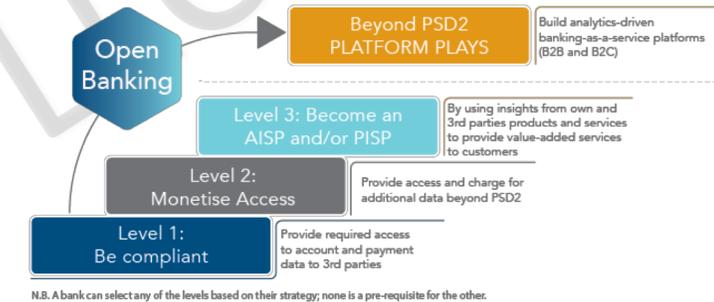
Robotic



- Robotic does not mean AI
- Robotic is best when repetitive work needs to be automated
- Robotic has been used for a while
- Combining Robotic with AI can be a powerful tool
- Banks data reconciliation projects use both technologies

The risk that banks are not seeing PSD2 regulation

- Once you have payment information, you have everything you need to replace major bank's offerings
- Corporate treasurers 2.0 are looking for services and efficiency
- Fintech companies will be the front-end for corporate treasurers replacing banks relationship managers
- These Fintech companies start replacing banks offering: Revolute, Amazon, ...
 - *Alibaba affiliate and fintech giant Ant Financial expanded from payments into wealth management. The Chinese company run a robo-advisory service using AI based on payment activities to suggest investments. "The core payment services acts as a gateway to a broader use of service", Bernstein research.*
- Read: <https://www.fintekminds.com/single-post/2017/12/10/Corporate-Banking-%E2%80%9CDigitalization-Strategy%E2%80%9D-Are-we-approaching-it-in-the-right-way>



Some concerns about AI in Fintech

- AI technology is too young to be fully understood and tested. The financial sector is especially vulnerable to attacks or misconducts
 - In 2013, social media and [the stock market went wild](#), briefly, on Tuesday when this (hacked) Associated Press tweet appeared around 1 p.m.: "Breaking: Two Explosions in the White House and Barack Obama is injured."
 - The market went wild and had devastating effect on automated financial markets
 - **AI is driven by data: garbage in is garbage out**
- Not every problem has an AI solution, beware of the marketing hype:
 - Marketers are using AI as the solution for every problem
 - They are doing to AI what they have done to Blockchain
- AI is costly: not in term of technology, in term of knowledgeable resources
- Developing world: the risk of repatriating help desks, supports and replacing them by Chatbots. Real loss of jobs in the developing countries

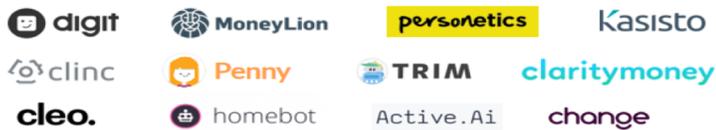
Consolidation will happen in the space

THE AI IN FINTECH MARKET MAP

CREDIT SCORING / DIRECT LENDING



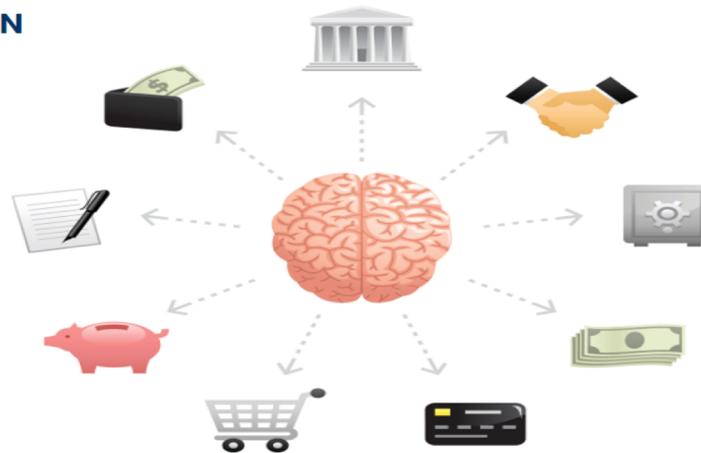
ASSISTANTS / PERSONAL FINANCE



QUANTITATIVE & ASSET MANAGEMENT



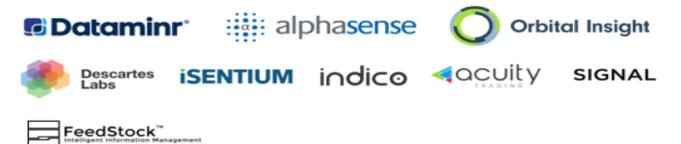
REGULATORY, COMPLIANCE, & FRAUD DETECTION



INSURANCE



MARKET RESEARCH / SENTIMENT ANALYSIS



GENERAL PURPOSE / PREDICTIVE ANALYTICS



BUSINESS FINANCE & EXPENSE REPORTING



DEBT COLLECTION



Final insight AI & Blockchain

- AI is a data driven business
- Blockchain is about storing and securing data

I can see these 2 technologies converging in the future to create the best secured distributed data storage easily accessible by AI tools

