FinTech:

Shaping the Financial World

Intro - March 30, 2020

FinTech 15.S08

- For those wishing to explore FinTech:

  - How new technologies are disrupting the financial services industry
  - Business models, products, applications and customer user interface
  - AI, Deep learning, Blockchain Technology and Open API's
  - Competitive Landscape of FinTech Startups & Big Tech vs. Big Finance

- For those who wish to gain critical reasoning skills to:

  - Understand the 'ground truths' of FinTech
  - Conduct Business & Technology Strategic Analysis

Intro Class: Readings

- *'The economic forces driving fintech adoption across countries'* Jon Frost, BIS Working Papers

- *'FinTech and market structure in financial services'* Financial Stability Board

- *'The Future of Banking'* FDIC Chair Jelena McWilliams

Intro Class: Study Questions

- What are the major technological trends materially influencing the provision of financial services?

- How is the competitive landscape shaping adoption of these new technologies around the globe? How are FinTech start-ups and Big Tech firms competing and cooperating with incumbents from big finance? How has Big Finance reacted?

- What do you wish to achieve in this Fintech course?

Intro Class: Overview

- Financial World

- FinTech

- AI, Open Banking & Blockchain Technology

- The Actors

- Teaching Team, Schedule, Assignments & Office Hours

Financial World
Intermediates Money and Risk

- **Functions**
  - Credit
  - Investments
  - Risk Transformation
  - Capital Markets & Price Discovery
  - Advice

- **Sectors**
  - Commercial Banks & Credit Unions
  - Asset Managers & Investment Vehicles
  - Insurance Companies & Underwriters
  - Investment Banks & Brokerage Firms
  - Exchanges & Clearinghouses
  - Financial Advisors

Financial World
Intermediates Money and Risk

Data
- Investing, Market Making, Marketing, Risk Management & Underwriting

Funding & Risk Management
- Balance Sheet & Capital
- Marketplace & Securitizations
- Derivatives, Guarantees & Reinsurance

Risks
- Credit; Funding; Liquidity; Market (Basis, Price, Rate, Spread, Volatility)
- Model; Operational; Reputational / Compliance
- Accidents; Health; Life Events; Natural Disasters; Weather

User Experience & User Interface

FinTech

- 'Technology-enabled innovation in financial services associated with new business models, applications, processes or products, all of which have a material effect ...'

Financial Stability Board
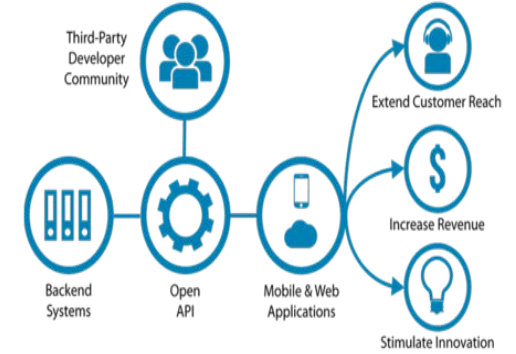
FinTech – Technologies of our Times
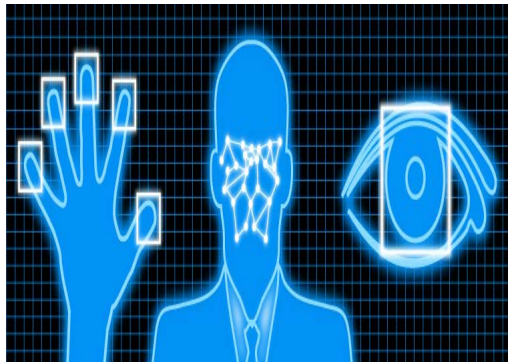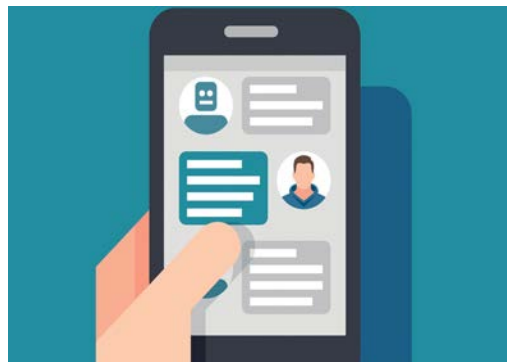

AI & ML

Blockchain

Natural Language Possessing

Open API

Biometrics

Chatbots

Cloud

Robotic Process Automation

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Customer Interface

Chatbots, CI & Voice Assistants (2010s)

Open APIs (2000s) & Open Banking (2015)

Contactless & Cardless Systems (2000s) >

Mobile Payments (2000s) & Wallets (2008) >

Internet (1990s) & On-line Banking (1990s - 2000s) >

Automatic Teller Machines (1970s) >

Credit Cards (1940 – 50s) & Point of Sale Systems (1980s) >

Mortgage Brokerage (1890s) & Automobile Indirect Lenders (1910s) >

Electronic Payments (1870s), Wires (1910s), ACH (1970s) & Direct Deposits (1970s) >

Checks (800s), Negotiable Checks (1500s), & Preprinted Checks (1760s) >

Banking - Tents, Temples, Bricks & Mortar (4th – 1st millennium BCE) >

Funding & Risk Management

ML Based Underwriting (2010s) >

Peer to Peer Lending (2005) >

Credit Default Swaps (1990s) >

Asset Backed Securitizations (1970s – 90s) >

Interest Rate Futures (1970s) & Interest Rate Swaps (1980s) >

Consumer Credit Scoring (1960s) & FICO Scores (1990s) >

Consumer Finance Companies & Warehouse Lines of Credit (1920s) >

Private (1880s, 1950s), Government (1930s) & GSEs (1930s) Mortgage Insurance >

Bankruptcy & Secured Lending Laws, Loan Servicing & Collection Agents (Days of old) >

Bank Deposits - (Antiquity) >

FinTech - Finance's Fertile Ground

- Digitalization of Money, Securities and Credit
- Vast and Expanding Amounts of Customer Data
- Rapid Expansion of Computational & Analytical Power
- Reliance on Multiple Systems of Ledgers
- Wide Public Acceptance of New Tech
- Legacy Customer Interface and Processing Systems
- Infrastructure Systems' Costs and Counterparty Risks
- Economic Rents and Centralized Concentrated Risks

FinTech – Disruptive Potential

- AI for Managing Risks & Targeting Products

- Updated Customer User Interface and Robo Advice

- Greater Financial Inclusion & Tailored Services

- 'Internet of Value': Movement of Value & Micro Payments

- Streamlined Accounting, Clearing, Compliance & Processing Systems

- Some Revenue Models shift to Data in exchange for Free Services

- Efficiencies & Tighter Margins in Financial Sector

AI and Machine Learning

Deep Learning in **One** Slide
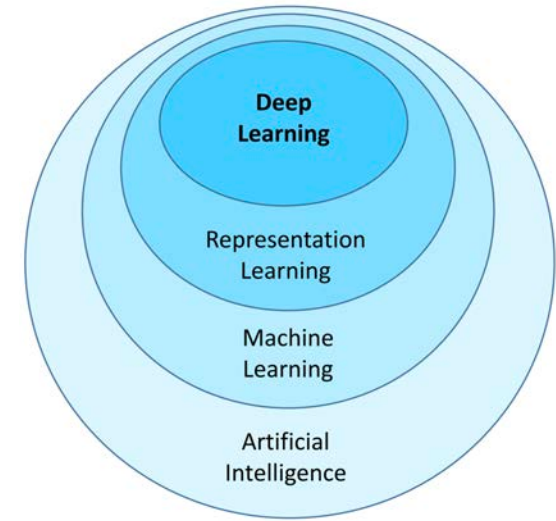
- **What is it:**
  Extract useful patterns from data.

- **How:**
  Neural network + optimization

- **How (Practical):**
  Python + TensorFlow & friends

- **Hard Part:**
  Good Questions + Good Data

- **Why now:**
  Data, hardware, community, tools, investment

- **Where do we stand?**
  Most big questions of intelligence have not been answered nor properly formulated

Exciting progress:

- Face recognition
- Image classification
- Speech recognition
- Text-to-speech generation
- Handwriting transcription
- Machine translation
- Medical diagnosis
- Cars: drivable area, lane keeping
- Digital assistants
- Ads, search, social recommendations
- Game playing with deep RL

Deep Learning

Representation Learning

Machine Learning

Artificial Intelligence

AI and Machine Learning - Finance
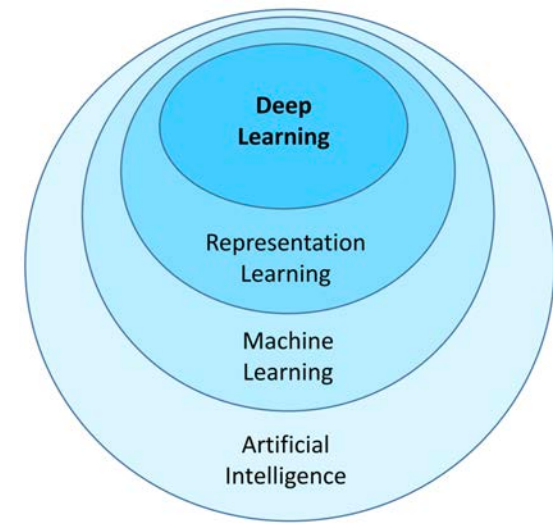
- Asset Management

- Call Centers, Chatbots, Robo-Advising & Virtual Assistants

- Credit (& Insurance) Allocation, Extension, Pricing & Scoring

- Fraud Detection & Prevention

- Regulatory – Anti Money Laundering, Anti Manipulation

- Risk Management & Underwriting

- Robotic Process Automation

- Trading

Image by Lex Fridman. Used with permission.

Open API & Open Banking

- Open Application Program Interfaces (Open API) allow outside Developers access to and an ability to Integrate Permissioned Customer Data into Third Party Applications

- Open Banking initiatives facilitate or mandate Open API for Non-banks to Share Permissioned Bank Customer Data

- Policy Trade-offs of Promoting Competition & Innovation, Limiting Cybersecurity Risks, and Maintaining Privacy & Consumer Protections

- EU Payment System Directive (PSD2), UK Open Banking Initiative, etc.

- Plus Screen Scraping, Reverse Engineering & Robotic Process Automation

Blockchain Tech Potential Uses

- <u>Speculative Investing</u>
- <u>Crowdfunding through Initial Coin Offerings</u>
- <u>Tokens for Exchanges, Gaming, Gambling, DeFi & File Sharing</u>
- <u>Tokenized Fiat (Stable Value Coins), Securities & Assets</u>
- Payment Systems
- Trade Finance & Supply Chain Management
- Clearing, Settlement & Processing
- Central Bank Digital Currencies & Payment Initiatives
- Digital ID & MIT Diploma
- Medical Records, Property Records, Internet of Things, Voting …

FinTech – The Actors

- **Big Finance**: Like Fortresses w/ Moats, Towers & Sovereign Affiliations
  - Towers: 1) Payments, 2) Balance Sheets, 3) Data, 4) Corporate Structure

- **Big Tech DNA Loop (BIS)**: 1) Data, 2) Networks, 3) Activities

- **Start-ups**: 1) Disruptive Innovators, 2) Flexibility, 3) Asymmetric Risk Takers

- **Official Sector**: Goals: 1) Innovation, 2) Inclusion, 3) Financial Stability, 4) Investor & Consumer Protection & 5) Guarding against Illicit Activities

Big Finance

FinTech – Payments & Credit

Big Tech

Payment Unicorns

Credit Unicorns

FinTech – Other Startup 'Unicorns'

- Insurance and Benefits

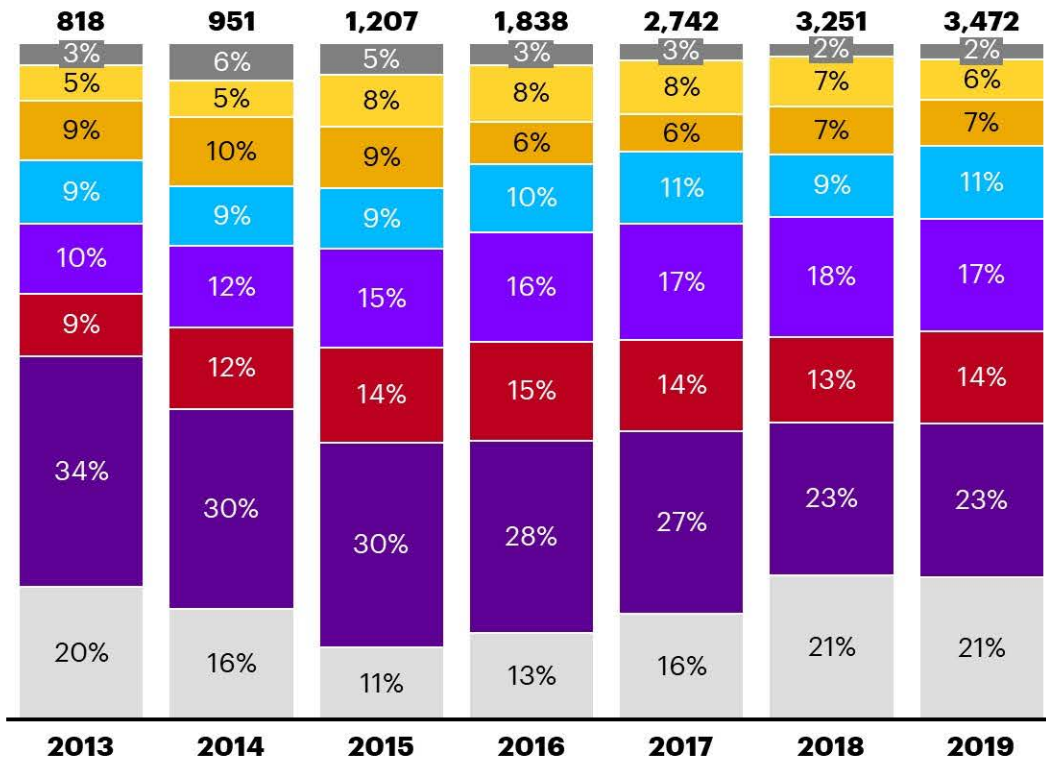- Trading and Capital Markets

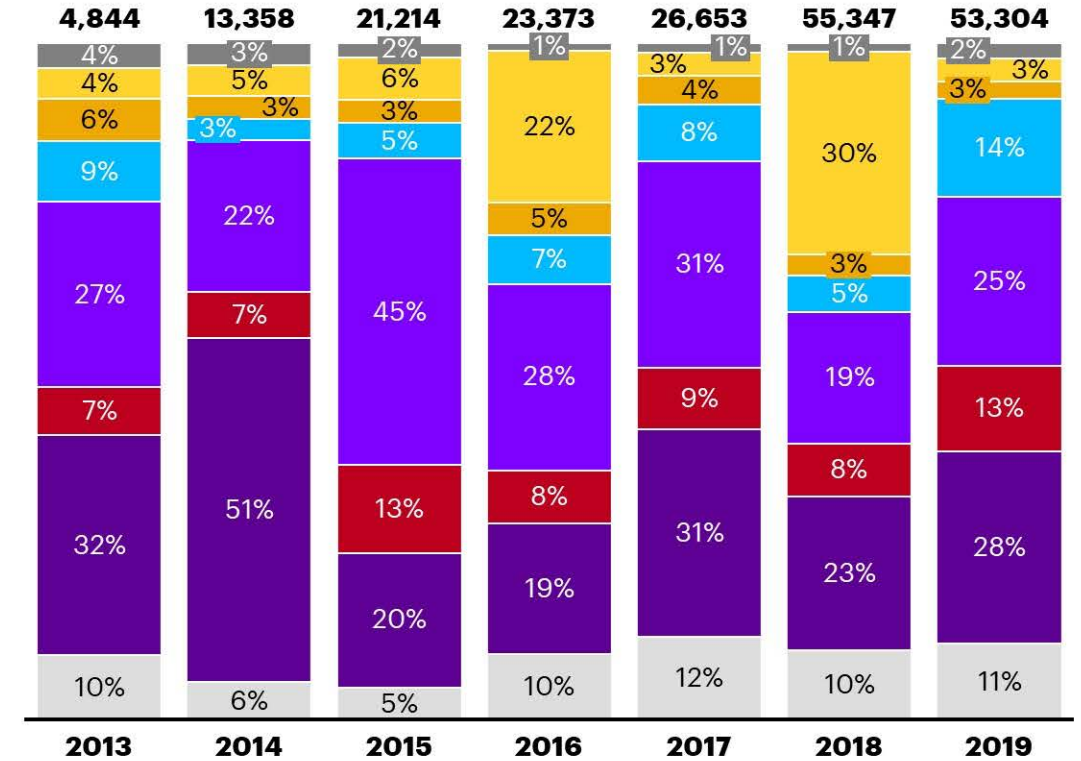- Asset Management and Advisory

- Comprehensive

GLOBAL INVESTMENT / BY PRODUCT

FUNDING INTO CHALLENGER BANKS MORE THAN TRIPLED IN 2019, HELPING LIFT CURRENT ACCOUNTS TOTALS; INSURTECH INVESTMENTS JUMPED 54%, WHILE FUNDING TO LENDING AND PAYMENTS STARTUPS BOTH GREW MORE THAN 20%

NUMBER OF DEALS

	2013	2014	2015	2016	2017	2018	2019
Total	818	951	1,207	1,838	2,742	3,251	3,472
Back office operations	3%	6%	5%	3%	3%	2%	2%
Wealth Mgmt & AM	5%	5%	8%	8%	8%	7%	6%
Markets	9%	10%	9%	6%	6%	7%	7%
Current accounts	9%	9%	9%	10%	11%	9%	11%
Lending	10%	12%	15%	16%	17%	18%	17%
Insurance	9%	12%	14%	15%	14%	13%	14%
Payments	34%	30%	30%	28%	27%	23%	23%
Other	20%	16%	11%	13%	16%	21%	21%

FUNDING $ (USD M)

	2013	2014	2015	2016	2017	2018	2019
Total	4,844	13,358	21,214	23,373	26,653	55,347	53,304
Back office operations	4%	3%	2%	1%	1%	1%	2%
Wealth Mgmt & AM	4%	5%	6%	22%	3%	30%	3%
Markets	6%	3%	3%		5%	3%	3%
Current accounts	9%	3%	5%		8%	5%	14%
Lending	27%	22%	45%	28%	31%	19%	25%
Insurance	7%	7%	13%	8%	9%	8%	13%
Payments	32%	51%	20%	19%	31%	23%	28%
Other	10%	6%	5%	10%	12%	10%	11%

Legend: Other | Payments | Insurance | Lending | Current accounts | Markets | Wealth Mgmt & AM | Back office operations

Note: Investments value referred to only deals with amount reported by CB Insights and deals volumes referred to all deals
Disclaimer: There might be variations in historical numbers in new releases of the FinTech Watchtower as Accenture Research performs historical review of the previous data in every release which include, not limiting to, adding/removing deals from CB Insights database based on relevance.
Source: Accenture Research analysis on CB Insights data

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Source: 'Fintech Fundraising Grew Strongly in Most Major Markets in 2019, Accenture Analysis Finds', Accenture (2/20/20)

Teaching Team

Gary Gensler
Faculty

Romain de Saint Perier
TA

Lena Ngor
Administrator

FinTech: Technologies

- Class 2 (4/1): Artificial Intelligence, Machine Learning and Deep Learning

- Class 3 (4/6): Artificial Intelligence in Finance

- Class 4 (4/8): Open API's & Marketing Channels

- Class 5 (4/13): Blockchain Technology & Cryptocurrencies

FinTech: Sectors

- Class 6 (4/15): Payments

- Class 7 (4/22): Credit & Lending

- Class 8 (4/27): Challenger Banks

- Class 9 (4/29): Trading & Capital Markets

- Class 10 (5/4): Risk Management & Regulation

FinTech: Wrapping it All Together

- Class 1 (3/30): Intro & Key Technological Trends Affecting Financial Services

- Class 11(5/6): Corona Crisis & Finance

- Class 12 (5/11): Conclusion

Assignments

- Group Research Paper (3000 – 3600 words due 5/11)   40%

  - Recommended business and technology strategy within a particular sector
  - To CEO of B of A, Amazon, or Andreessen Horowitz
  - Teams required to be Formed and Sector Selected by 4/8

- Individual Business Write-up (900 – 1200 words due 4/24)   30%

  - Each student <u>individually</u> addresses 1 of the following:
  - a) overall market analysis, b) technology trend analysis, c) traditional competitor analysis, & d) big tech & fintech disrupter competitive analysis

- Class Participation   30%

Professionalism & Academic Integrity

- Success goes to those Prepared, Curious & Self Starters

- Respect & Courtesy builds Reputations, Networks & Trust

- Learning comes best to those who Listen as well as Talk

- Understanding Strategy and Paying Attention to Details both Matter

- Staying True to your Values is the best alternative

- Avoiding Plagiarism is not just an Academic Integrity Policy
  - It respects other Authors
  - It protects one's Grade, Job and Reputation

Be attentive, speak in class, keep your video on, and audio muted unless speaking

Proper attribution of quotes and paraphrasing is required