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Module 1.0 - What is FinTech

Definition

Fintech is the intersection of finance, technology, and regulation

Why the rise of FinTech

Post 2008 GFC:

Banks prioritized regulation & compliance, not innovation

Fintech bridges the gap between the value propositions of banks and customers expectation

Both big tech & startups' are in fintech however, big tech has funding, backing, talent, capital pool, and customer's trust

Fintech is transforming finance in developed markets, emerging markets, and the traditional banking & finance industry as a whole

Fintech 1.0 – Infrastructure

History

Objectives: Builds infrastructure that supports today's global financial markets

Earliest form of tech - Money is a form of technology

Beginnings of fintech –

In 1867, the first transatlantic telegraph cable was laid, connecting markets of London to New York, or London to Paris, etc

Undersea cables are the core of communications and data around the world

1860s- WWI - First phase of globalisation

WWII - Because of the processes of breaking codes/ in-coding , it led to development in computer technology and then AI

Fintech 2.0 - Banks

Digitalization:

Defined as process & systems which were formerly analogue

Key Events

Started in 1967 - Establishment of the 1st ATM, Barclays bank in the UK

1972 - Launch of the 1st calculator by Texas Instruments

1st electronic stock exchanged – Nasdaq

Increased digitalization began more after the 2008 GFC

Fintech 3.0 & 3.5: Startups and emerging markets

Factors of 2008 impacting the development of Fintech

- Unemployment - Forced people to search for new opportunities resulting in startups
- Regulatory Changes - Regulations to prevent another 2008 from happening again. Resulted in less profits, increase in compliance & regulatory cost. To reduce cost, tech was implemented
- Distrust in banks - People were more comfortable in dealing with big tech firms
- Invention of 1st smartphone - The first iphone launched in 2007

Paypal - One of the first fintech startups

Bloomberg - Most valuable private information services provider

Banks & Fintech collaborate through acquisition

Cross-regional collaboration

Compliance - Onboarding is important

Banking is not going to change via disruption but by collaboration

Fintech Typology

Finance & Investment

- Alternative Financing
 - Crowdfunding
 - P2P Lending
 - ICO (Initial Coin Offerings)
- Digitized traditional forms of investing
- Stock Market (High Frequency trading)
- Hedge Funds (Invest in tech to gain an advantage in trading/investment)

Operations & Risk Management

- Pre 2008
 - Focused on Quantitative Risk Modelling Techniques
i.e VAR (Value-at-Risk Systems)
- Post 2008
 - Spending was more on IT

Payments & Infrastructure

- Electronic payments - Most common interaction with FinTech
- Blockchains - Transforming more traditional way of large volume electronic payments

Data Security & Monetization

- Datafication - Application of sophisticated analytic systems to analyse data to come up with new ideas to monetize the data
- Security is paramount to prevent hacking/financial destabilization

Technology in the customer service interface

- How we interact with this interface to create new business opportunities

Emerging Economics: Opportunities and Challenges

Fintech opportunities are greater in emerging markets/developing economies

2 key aspects (i.e. Asia)

- High penetration of smartphones
- Ability of high/wide internet access

Allows the leap of development in a span of a few years vs longer years for development for developed economies

Combination of startups & speed of change is the catalyst for driving opportunities

From Too-Small-To-Care to Too-Big-To-Fail

Too small to care- Regulators think that not everything is worth regulating for (1 or 2 customers that will be affected)

Too big to fail - Rooted in the problems of the 2006 GFC

FinTech can grow from too small to care to too big to fail overnight because of mobile devices as distribution channels/

Fintech regulations

- Challenges to achieve financial inclusion & minimizing risk/security
- Changes in new entrants
- Speed of development

Prior to 2008 - Financial innovation was mainly into credit derivatives, CDO, asset backed securities, etc

Regulators have spent resources building tighter regulatory frameworks to prevent another financial crisis

Continued challenges of balancing safety of consumers, financial sector, financial inclusion, innovation, and development

RegTech impact

- Blockchain
- Cognitive Computing
- IoT,
- Open-source & API economy
- Cloud computing
- Big data
- Semantic web

Module 2.0 : Payment, Cryptocurrencies, Blockchain

Phases of Money

Barter - 9000 B.C. - 600 B.C.

Commodity money - 1100 B.C. (Gold, silver)

Coinage - 600 B.C. (Paper money started in China, then Europe)

Dematerialized payments - 1950's onwards

RTGS (Real-time Gross Settlement)

Allows transactions between banks to be happen in real time & settle on a 1:1 basis

RTGS Factors

- Technological capabilities
- Customer expectation of instant delivery

RTGS in Fintech

- P2P Payments (Venmo)
- P2P Lending (Speed of loan delivery)

Alternative Finance

Driving aspects

- AI
- Blockchain
- Cloud computing,
- Data

New Payment Stack

- 19th century - Physical payment (gold, paper money, checks)
- 20th Century - Digitalization of payments (mobile payments)
- 21st Century - Datafication (Use of AI, Big data to transform payment experience) i.e. EU created an Open Banking system - New entrants, Tech Firms, & startups can access the data

Cryptocurrencies

- Secured digital asset based on blockchain
- Not issued by central authority
- Immune to government interference/manipulation
- Resolves double spending issue (duplicates)
- Instantaneous
- Low – cost
- Borderless
- Fixed-supply

Challenges

- Not so user friendly - Risk of losing private key
- Not eco-friendly - Uses a lot of electricity
- Volatility - Payment & exchange value issues

Digital Assets Markets

- Primary Market - ICO (Projects & investors)
- Secondary Market (Digital assets [bitcoin, ethereum], Between traders & traders)

Digital Assets Exchange

By: Gatecoin

Centralized (Cryptos 2 Crypto transactions, Fiat to Cryptos transactions)

Decentralized (P2P, no central authority, mainly crypto to crypto)

Acts as the marketplace (24/7) Custodian, Settlement, & Clearing House

What makes a good exchange?

- Security - Potential to be hacked/has been hacked, security measures taken
- Liquidity - Better & fairer prices, market stability, quick transactions

Stablecoins

By: Feron Labs

Definition

Cryptos with price stabilization mechanisms

Models:

Fiat - Collateralized

- Collateral held at normal financial institutions
- Fixed exchange ratio
- Arbitrage between market price & exchange ratio
- Not decentralised
- De facto extension of fiat money

Crypto - Collateralized

- Collateral held in smart contract
- Dynamic exchange ratio
- Protected from value decline, but carries cost
- Potentially decentralised, relies on external assets, and requires complex governance

Pegged - Uncollateralized

- Price change counteracted by change in stablecoin supply
- Smart contract reacts to price signals by exchanging stablecoins for another native asset
- Faced with severe regulatory restrictions
- No models of this type have been launched yet (As of 2020)

Unpegged - Uncollateralized

- Algorithmic central bank offers a range of riskless deposit, absorbs liquidity into a single structure
- Withdrawals interpreted as a decline in price expectation, triggering increase in interest rates
- Liquidity prevented from reaching exchanges and turning to sell orders

Behaviour analysis and crypto valuation

By: Sentiment

Challenges

- Cryptos and coins lack utility - Current uses are speculative
- Lacks mass adoption

Valuation

Method 1:

- Tells whether an asset is over/undervalued
- $MVRV \text{ Ratio} = \text{Total market cap} / \text{Realised Cap}$

Method 2:

- Mining activity for Ethereum

Blockchain

- Combines 2 technologies: Distributed ledger technology & Cryptography
- Distributed ledger technology: Not centralised, information stored in multiple identical ledgers
- Cryptography - Encryption of information
- Secure, permanent (can be traced), transparency (Can see what is happening in blockchain)
- Smart contracts: Automated systems that execute on pre-determined actions
- A crypto involves blockchain but a blockchain does not necessarily involve crypto

Problems

Not all blockchains are secure, compare blockchain created by you in basement vs Ethereum, Hyperledger, r3, etc

Garbage in - garbage out - Bad information in, it will be there forever

Privacy - Data is public

Not solution for every problem

Use Case : Ripple

- Used by Standard Chartered Singapore to enable real-time cross border transactions based on blockchain
- Used for global trade payments, e-commerce payments, international payments & pensions, and international corporate dividends

Module 3.0: Digital Finance & Alternative Finance

Definition

- Financial channels and instruments that emerge outside of the traditional financial system.
- Online capital markets
- New investment classes being sought to be created, including equity, loans to SMEs, and crypto assets

Digitisation of financial services

After 2008 GFC, liquidity & credit risks dried up, this resulted in alternative financial models springing up

Fintech & Funds

In the old way, investment banks had to go to hedge fund managers then to research/manage client's fund portfolio.

Fintech allows the crowdsourcing & crowdfunding of portfolio from around the world (Quantopian, Amareos) for hedge funds

Allows much faster processes

AI in Fintech

P&C (Nordic insurance company) use Cortana analytics for churn modelling & upsell predictions

Callcredit (UK credit reference agency) uses Microsoft AI to identify fraud

MioTech uses AI for financial analysis for financial institutions

Crowdfunding Models

- Donations
- Rewards
- Lending
- Equity

Companies (i.e. Kickstarter, Indiegogo, Angelhub)

Difference between Seed/Angel, Venture Capital (VC), Private EquityFundraising Journey

1. Seed capital
2. Early stage
3. Later stage
4. IPO
5. Public funding

Seed/ Angel

- Young companies
- Business plan
- Prototype
- MVP (Minimum viable product)

Investors: Friends & family, Angel investors & groups who want to get involved with the business

Venture Capital

- Early- stage companies
- Revenue model tested
- Growing customer base
- Revenue strategy

Investors: Venture capital funds, VC firms, focus on startups (i.e. more than 3 million, brings co-investors to close a round)

Private Equity

- Later stage companies
- Beyond revenue generation,
- Profitable margins

Investors: Private equity firm/hedge funds - fund established companies, short investment horizon

Fundraising Instruments

- Equity - Stake in the company
- SAFE - Pay a lower price for future company shares
- Convertible Note - Debt instrument that has the right to convert into equity upon meeting the company's milestone
 - If milestone not met - Company owes investors capital + interest

Debt -crowdfunding

- Alternative investments when interest rates are low
- More rampant after 2008 GFC as bank regulations increased
- Also known as P2P lending/crowdlending
- Companies i.e. kiva, zopa, prosper, lending club

Trends: High rated loan categories, marketplace lending

TechFins

Term first coined by Jack Ma in 2016

Used to distinguish tech companies involved in finance in China from financial institutions & fintech startups in USA

Companies i.e. Baidu, Alibaba, Tencent

Compared to Fintech, TechFin is to rebuild the system with technology

ICO

- Short acronym for Initial Coin Offering
- Consists: Digital token, limited time offer, predefined supply
- Different from stocks
- No economic rights
- No voting rights
- No defined rights
- Not bound by regulatory frameworks

Advantages

- No dilution
- Democratisation of capital raising
- Crowdsourced fundraising from around the world

Current trends

- Becoming more trustworthy & institutionalised
- Know your client (KYC)
- Anti-money laundering (AML)
- More regulatory enforcement
- Governance & transparency
- Tax oversight on cryptos

Collaborative & contextual banking

Companies (i.e. Webank)

No physical bank < Intelligent technology stack & digital channels

Contextual banking - Combines other industries & financial institutions through collaboration to come up with intelligent products

Module 4.0: Fintech regulation & RegTech

Prior to 2008 GFC –

General consensus was in favor of market-based approaches defined by the efficient market hypothesis

Assumption of hypothesis

- Perfect information
- No transaction costs
- Perfect competition
- Rational market participants

After 2008 GFC –

Problems of Systemic risk –

Defined as the collapse of one financial institution will lead to the collapse of the entire financial institution which will cause the collapse of an economy.

This has resulted in more regulation to prevent financial crisis, build confidence, and make markets more efficient

Explosion of fintech after GFC

Main idea was to disrupt traditional institutions, industries, and finance

Regulation was difficult because regulators were trying to balance innovation & growth with financial stability & consumer protection

Ways of regulation

- Doing nothing - Allows explosion of fintech, (i.e. China)
- Contact points - Regulators learn about new companies to develop appropriate regulatory responses
- Sandboxes - Areas of experimentation with limited market context & regulation for company and regulator to learn how to move forward
- New regulatory frameworks - Develop new regulatory frameworks

RegTech Evolution

Short for Regulatory Technology

Idea is to use technology to make more effective financial market regulation

Can be used also in other aspects of the economy (i.e. environment, aviation)

Use Cases:

- Regulatory compliance
- Regulatory monitoring
- Regulatory design

RegTech eco-system

Encompasses

- Financial institutions
- Startups
- Regulators

Compliance Challenges

- Keeping up with regulatory changes
- Large fines

Requirements

- Know-your-client (KYC) - Preventing criminal use of the financial system
- Anti-money laundering (AML)

Technology has been used to standardise account opening processes & meet reporting requirements

Adoption of RegTech

- Increases in regulatory fines
- Frequent regulatory changes
- Increase in staffing costs

Smart regulation

Extends to collaboration between policymakers, regulators, startups, and traditional financial institutions

Concept

- Ability to redesign underlying infrastructure
- Needs better information & monitoring
- Beware of new entrants

This can result to new system designs and digitising regulation

Enables industry players to comply with regulations in digital form

Key to understand

- Technology is not a limiting factor
- To be aware of the performance & inefficiencies

Module 5.0 : Fintech regulation & RegTech

History of Data Regulation

Privacy - Protecting your personal life

Cross border data management

- Data residency - National sovereignty
- Data protection - National security

Data management

- Is data an asset/liability?

Emerging trends:

Data as money

Data in financial services

- Hedge Funds
- Insurance
- Banking

Currently, data is used as a by-product vs a core asset that is valued

To use data effectively, financial institutions should consider the 3 v's of data

- Volume
- Velocity
- Variety

Monetisation of Data (EU)

- GDPR - General Data Protection Regulation: Gives individuals power & control over personal data
- PSD2 - Payment Services Directive 2: Allows open entry of new entrant to payment industry
- MiFID II - Markets in Financial Instrument Directive II: Greater transparency, report all transactions relating to EU financial instruments

Digital Identity

- Physical identity - Fingerprint, iris, DNA
- Legal identity - IC, passport, driving license
- Electronic identity - Facebook, Twitter, Weibo
- Behavioural identity - The way you talk/message

Emerging trends:

- Ownership
- Aggregation into a single wallet
- Grant access/monetise

AI & Governance

AI F.A.T

- Fairness
- Accountability
- Transparency

There is a need to combat negative/unconscious bias outcomes,

Data, metadata, and differential privacy

Data - Companies usually do not have personal identifiable information (PII) as it will lead to more stringent regulatory

Metadata - Contextual data which is around a content

Differential privacy - Giving information to a person without revealing the whole dataset

Module 6.0: Future of Data-Driven Finance

Fintechs are not just about startups

Fintechs are a global phenomenon with very different local peculiarities

Companies

- Revolut - Unbundling & rebundling of finance
- Credit Karma - Data monetisation
- Alibaba group - Financial services from scratch
- Aadhaar - Infrastructure for billions of people
- Digibank by DBS - Traditional banks in Fintech

Big trends - Looking forward

- TechFins
- Voice user interface
- Data as the new oil/gold (monetisation)
- AI
- Cryptocurrency

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