

金融科技



Tamkang
University
淡江大學

FinTech: Financial Technology

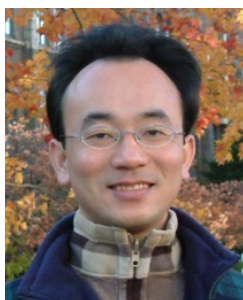
Fintech 金融科技： 金融服務科技創新

(Fintech: Technology Innovation in Financial Services)

1052FinTech03

MIS EMBA (M2263) (8595)

Fri, 12,13,14 (19:20-22:10) (D409)



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2017-03-03



課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
1	2017/02/17	Fintech 金融科技課程介紹 (Course Orientation for Fintech: Financial Technology)
2	2017/02/24	Fintech 金融科技的演進：貨幣與金融服務 (Evolution of Fintech: Money and Financial Services)
3	2017/03/03	Fintech 金融科技：金融服務科技創新 (Fintech: Technology Innovation in Financial Services)
4	2017/03/10	Fintech 金融科技與金融服務價值鏈 (Fintech and Financial Services Value Chain)
5	2017/03/17	Fintech 金融科技商業模式創新 (Fintech Business Models Innovation)
6	2017/03/24	Fintech 金融科技個案研究 I (Case Study on Fintech I)

課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
7	2017/03/31	金融服務消費者心理與行為 (Consumer Psychology and Behavior on Financial Services)
8	2017/04/07	教學行政觀摩日 (Off-campus study)
9	2017/04/14	區塊鏈技術 (Blockchain Technology) [Invited Speaker: Dr. Raymund Lin, IBM (林俊叡 博士，IBM)]
10	2017/04/21	期中報告 (Midterm Project Report)
11	2017/04/28	Python Pandas財務大數據分析 (Finance Big Data Analytics with Pandas in Python)
12	2017/05/05	人工智慧與深度學習金融科技 (Artificial Intelligence and Deep Learning for Fintech)

課程大綱 (Syllabus)

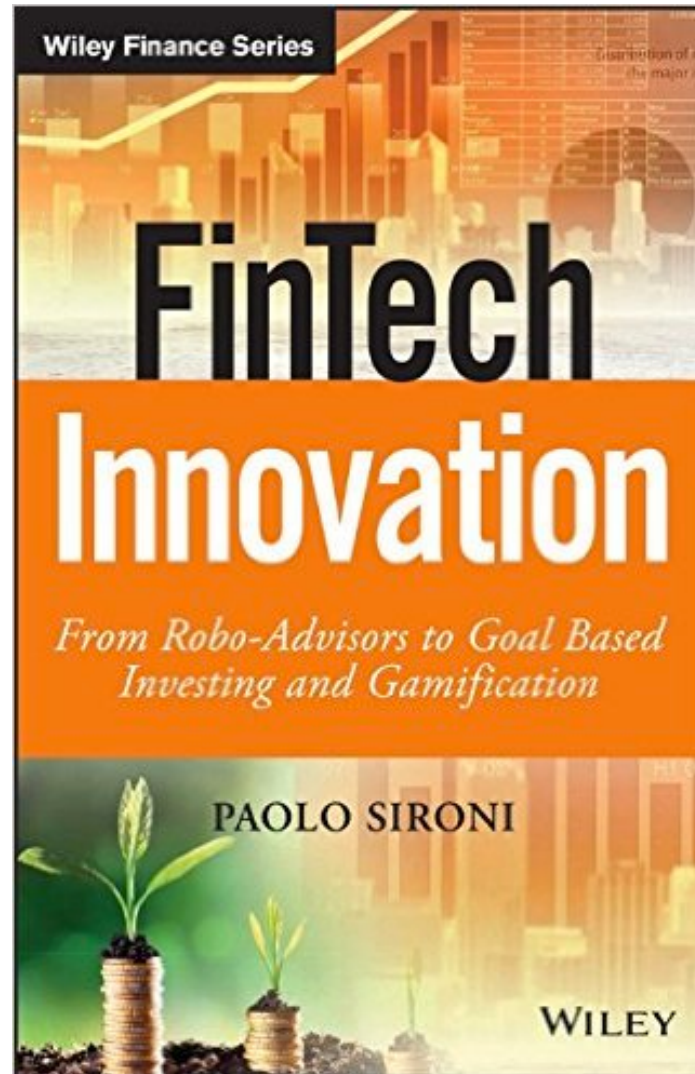
週次 (Week)	日期 (Date)	內容 (Subject/Topics)
13	2017/05/12	Fintech 金融科技個案研究 II (Case Study on Fintech II)
14	2017/05/19	金融科技財富管理：機器人理財顧問 (Robo-Advisors for Wealth Management in Fintech)
15	2017/05/26	投資組合最佳化與程式交易 (Portfolio Optimization and Algorithmic Trading)
16	2017/06/02	金融科技智慧問答系統 (Intelligent Question Answering System for Fintech)
17	2017/06/09	期末報告 I (Final Project Presentation I)
18	2017/06/16	期末報告 II (Final Project Presentation II)

Fintech: Technology Innovation in Financial Services

Paolo Sironi (2016)

FinTech Innovation:

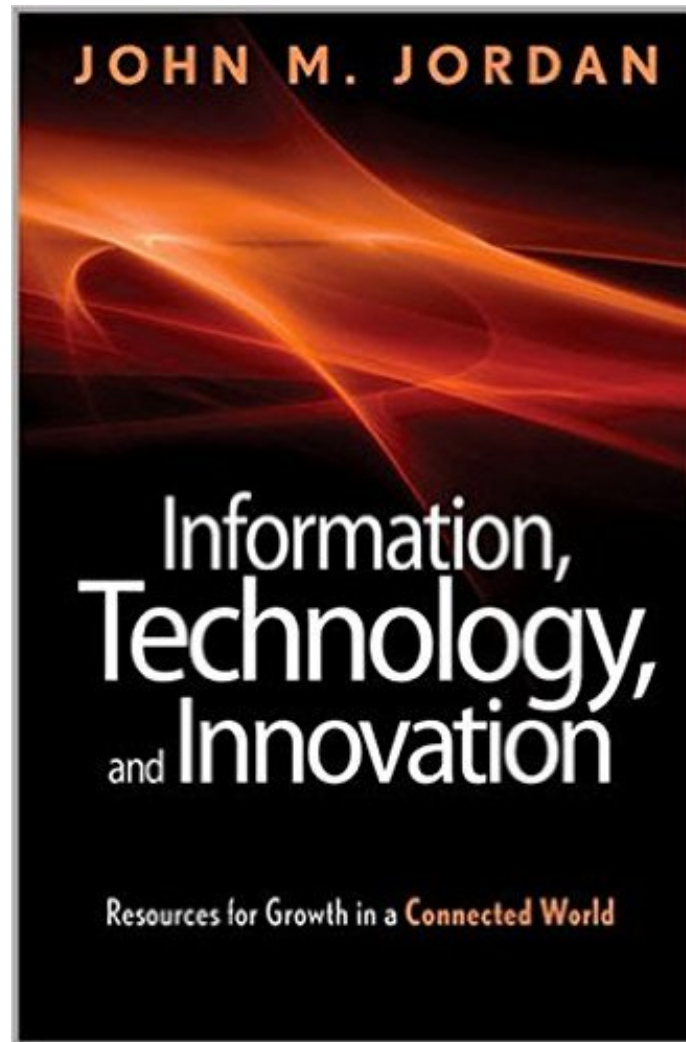
From Robo-Advisors to Goal Based Investing and Gamification,
Wiley



John M. Jordan (2012),

Information, Technology, and Innovation:

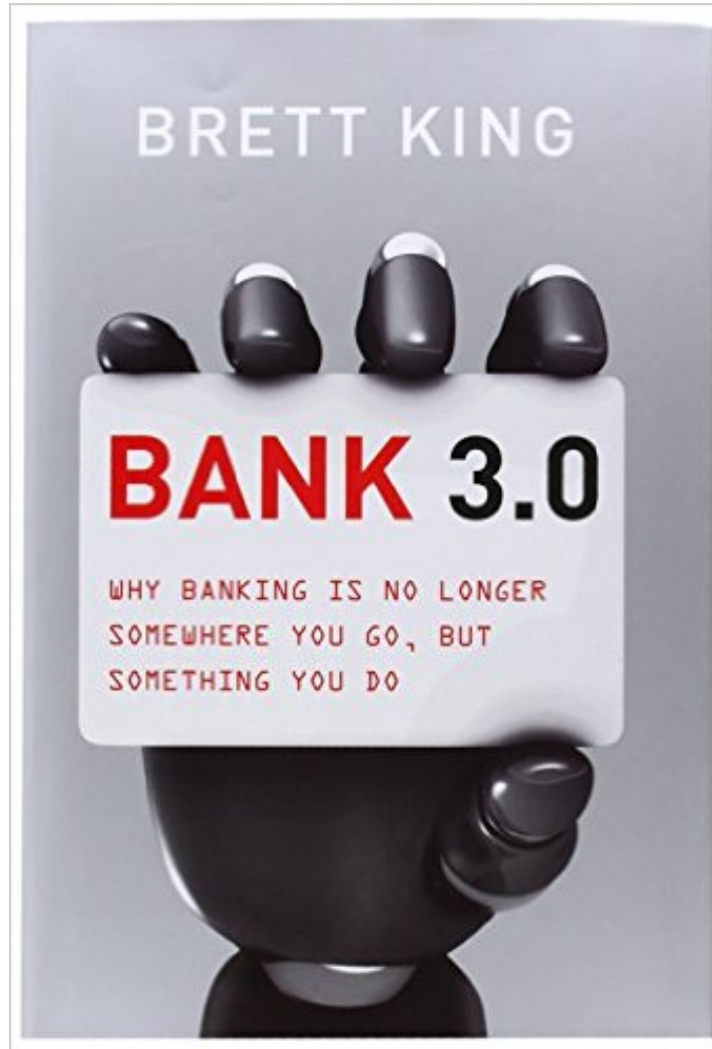
Resources for Growth in a Connected World,
Wiley



Brett King (2012),

Bank 3.0

Why banking is no longer somewhere you go, but something you do,
Marshall Cavendish International Asia Pte Ltd

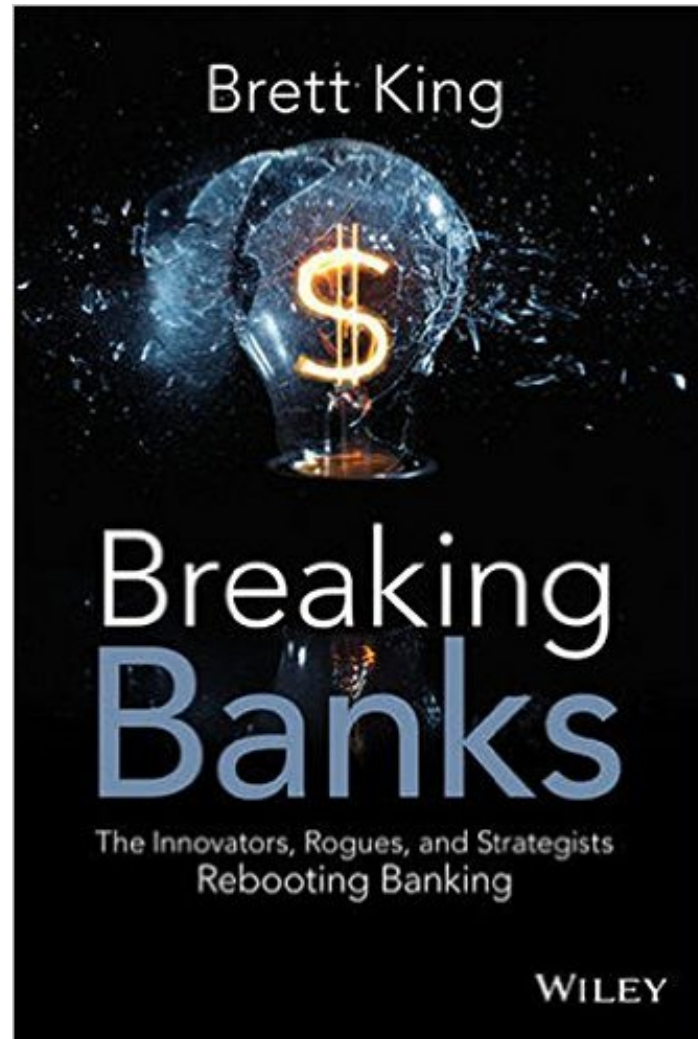


Brett King (2014),

Breaking Banks:

The Innovators, Rogues, and Strategists Rebooting Banking

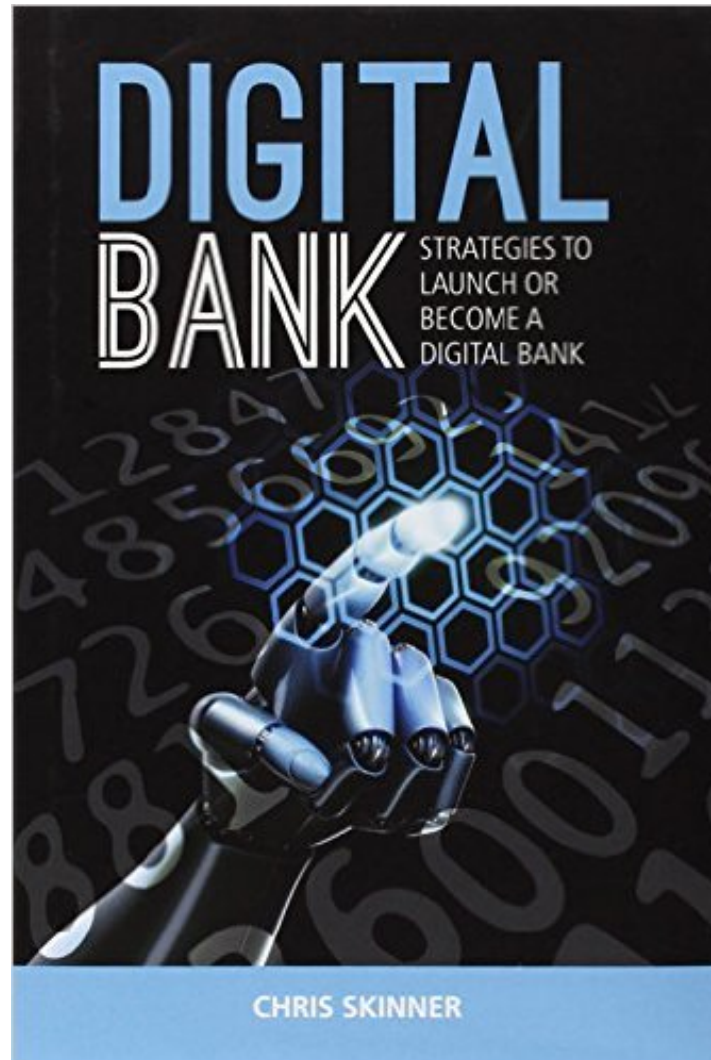
Wiley



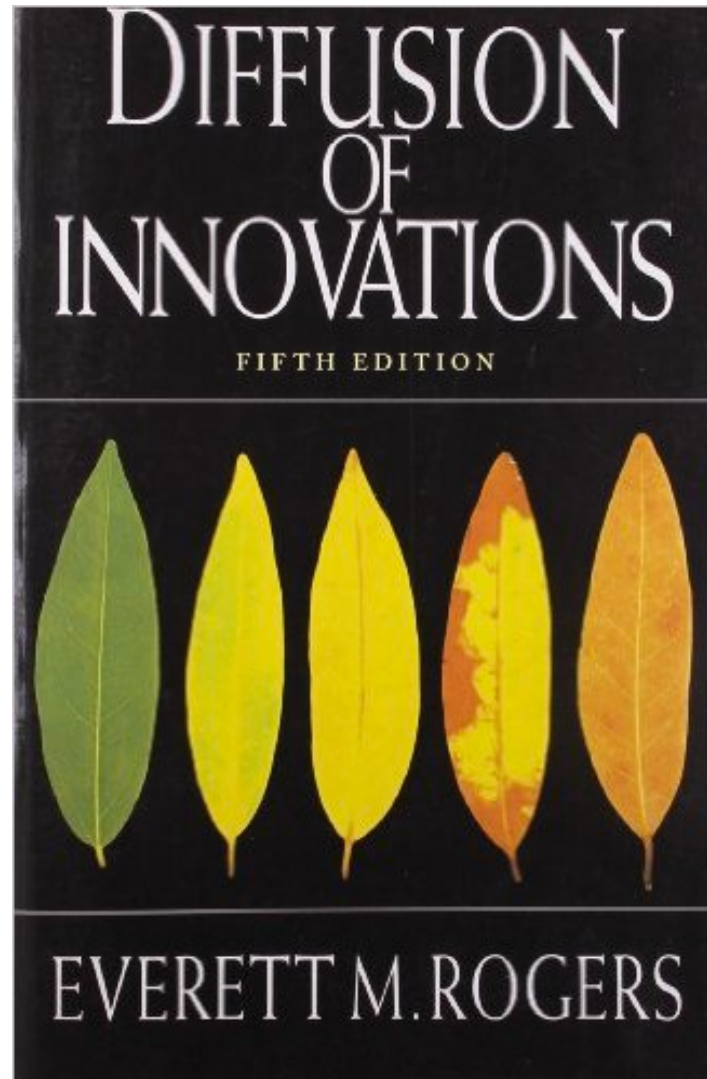
Chris Skinner (2014),

Digital Bank:

Strategies to Launch or Become a Digital Bank,
Marshall Cavendish International Asia Pte Ltd



Everett M. Rogers (2003),
Diffusion of Innovations,
5th Edition, Free Press



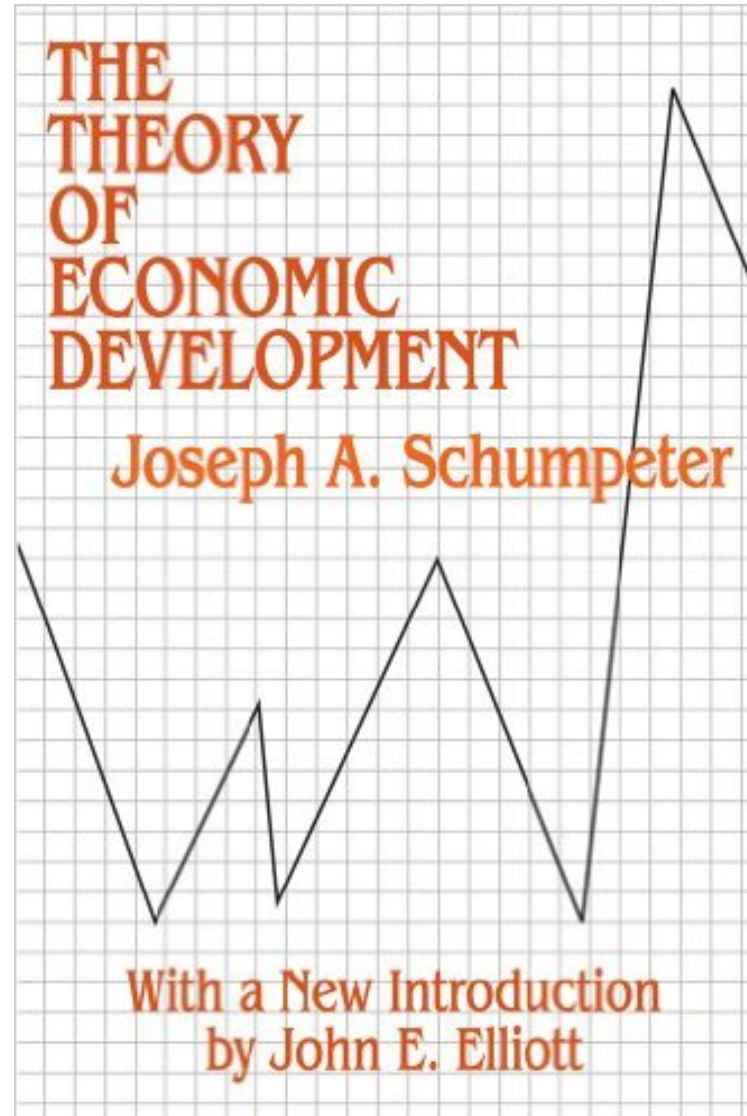
(Rogers,
1962;
1971;
1983;
1995;
2003)

Joseph A. Schumpeter,

The Theory of Economic Development:

An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle,

Transaction Publishers, 1982



(Schumpeter, 1912)

Financial Technology

FinTech

“providing
financial services
by making use of
software and
modern technology”

Financial Services

Technology Innovation

Innovation

Innovation:

a new idea,
method, or
device

Innovation:
something
new

Novelty :

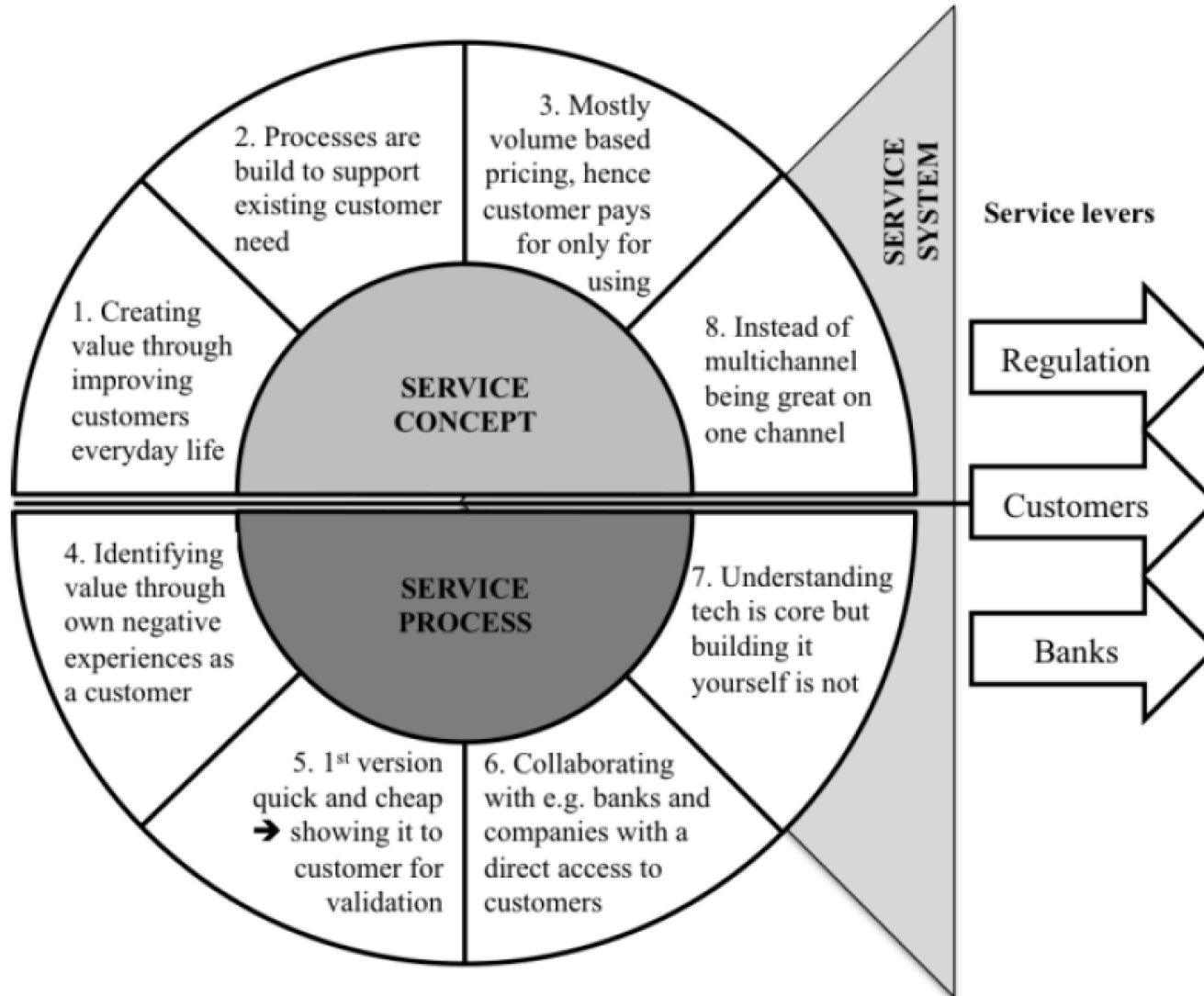
something new or unusual

the novelty of a self-driving car

**Creativity is not a
new Idea.**

**Creativity is
an old belief
you leave behind**

FinTechs as Service Innovators: Analysing Components of Innovation



Innovation

“a process of
searching and
recombining
existing knowledge
elements”

Search and recombination process to innovate:

A review of the empirical evidence and a research agenda



Source: Savino, Tommaso, Antonio Messeni Petruzzelli, and Vito Albino. "Search and recombination process to innovate: A review of the empirical evidence and a research agenda." *International Journal of Management Reviews* (2017).

Innovation Research **in** **Economics,** **Sociology and** **Technology Management**

Source: Gopalakrishnan, Shanti, and Fariborz Damanpour.

"A review of innovation research in economics, sociology and technology management." *Omega* 25, no. 1 (1997): 15-28.

Innovation Research in Economics, Sociology and Technology Management

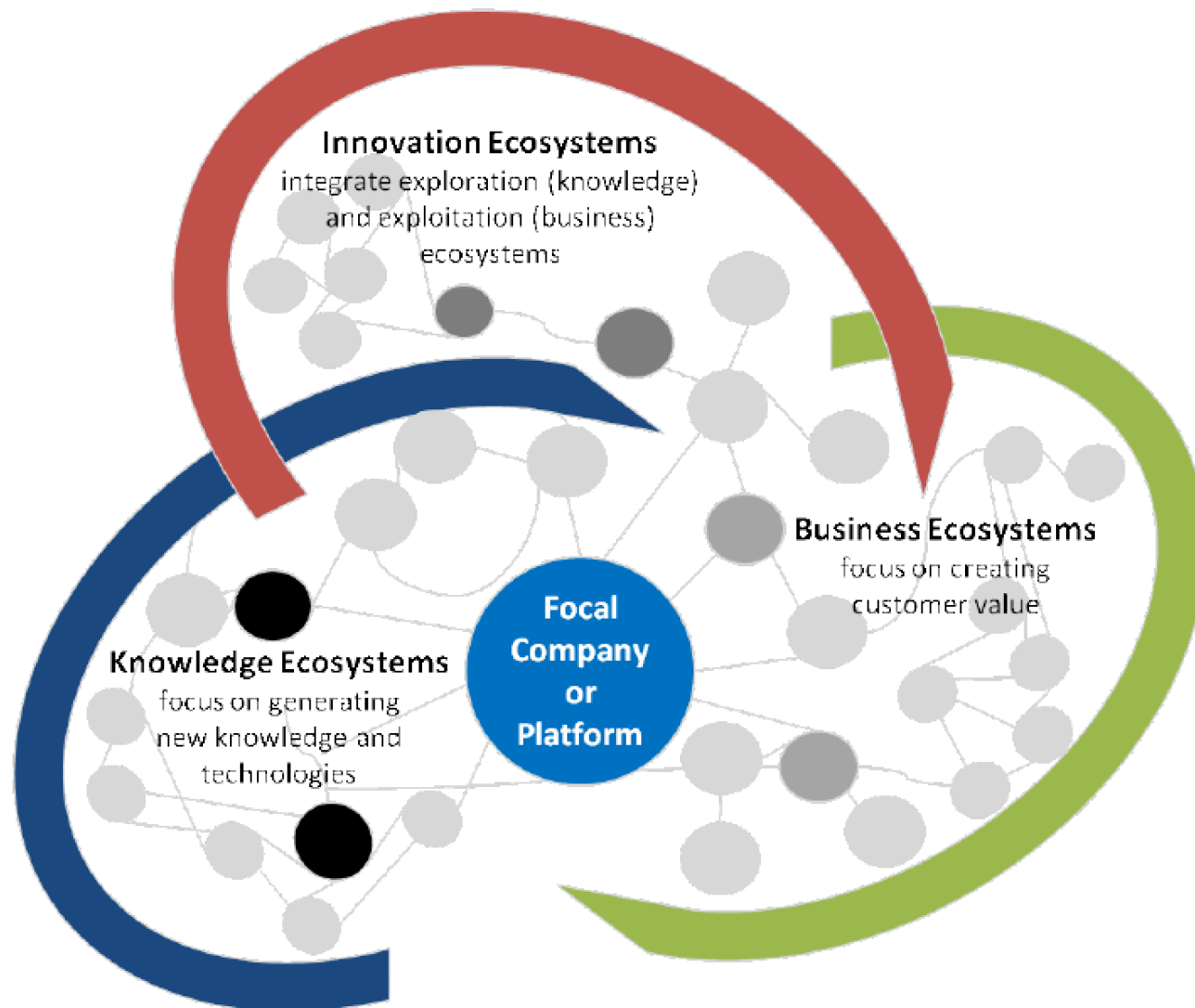
	Stage of process	Level of study	Type of innovation
<i>Economists</i>	Generation Idea generation Project definition	Industry	Product and process Only technical Only radical
<i>Technologists</i>			
Contextual technologists	Generation Commercialization and marketing Diffusion	Innovation (in the industry context)	Product and process Only technical Radical and incremental
Organizational technologists	Generation Idea generation Problem solving adoption Adoption Initiation	Organizational Sub-system	Product and process Only technical Radical and incremental
<i>Sociologists</i>			
Variance sociologists	Adoption Initiation Implementation	Organization	Product and process Technical and administrative Radical and incremental
Process sociologists	Adoption Initiation Implementation	Innovation (at the organizational level)	Product and process Technical and administrative Radical and incremental

Source: Gopalakrishnan, Shanti, and Fariborz Damanpour.

"A review of innovation research in economics, sociology and technology management." *Omega* 25, no. 1 (1997): 15-28.

Business, Innovation, and Knowledge Ecosystems

Business, Innovation, and Knowledge Ecosystems



Source: Valkokari, Katri. "Business, innovation, and knowledge ecosystems: how they differ and how to survive and thrive within them." *Technology Innovation Management Review* 5, no. 8 (2015).

Innovation Ecosystems

Characteristics

	Business Ecosystems	Innovation Ecosystems	Knowledge Ecosystems
Baseline of Ecosystem	Resource exploitation for customer value	Co-creation of innovation	Knowledge exploration
Relationships and Connectivity	Global business relationships both competitive and co-operative	Geographically clustered actors, different levels of collaboration and openness	Decentralized and disturbed knowledge nodes, synergies through knowledge exchange
Actors and Roles	Suppliers, customers, and focal companies as a core, other actors more loosely involved	Innovation policymakers, local intermediators, innovation brokers, and funding organizations	Research institutes, innovators, and technology entrepreneurs serve as knowledge nodes
Logic of Action	A main actor that operates as a platform sharing resources, assets, and benefits or aggregates other actors together in the networked business operations	Geographically proximate actors interacting around hubs facilitated by intermediating actors	A large number of actors that are grouped around knowledge exchange or a central non-proprietary resource for the benefit of all actors

Source: Valkokari, Katri. "Business, innovation, and knowledge ecosystems: how they differ and how to survive and thrive within them." *Technology Innovation Management Review* 5, no. 8 (2015).

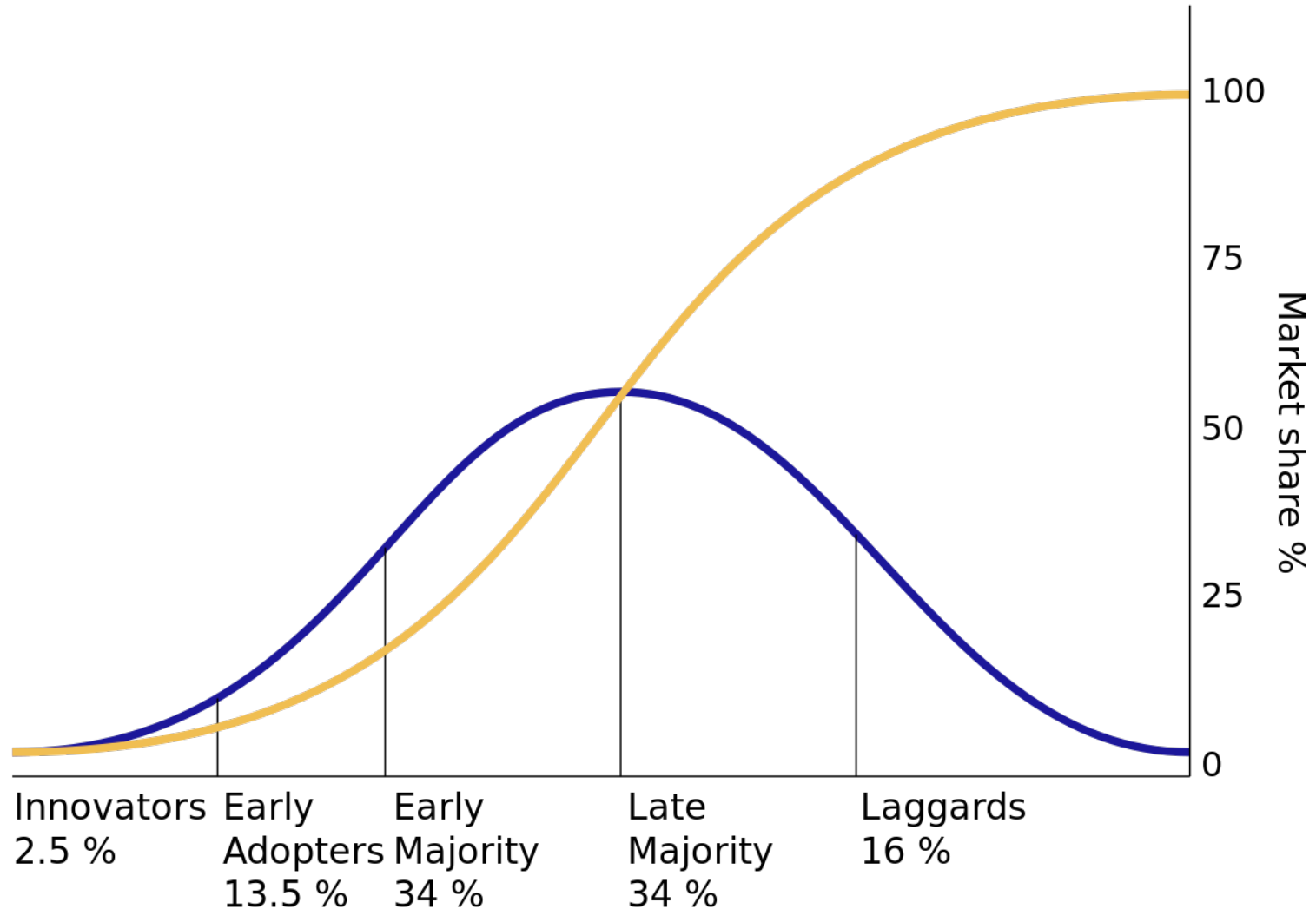
Diffusion of Innovation Theory (DOI)

Innovation

(Diffusion of Innovation)

1. Relative advantage
2. Compatibility
3. Complexity
4. Trialability
5. Observability

Diffusion of Innovation



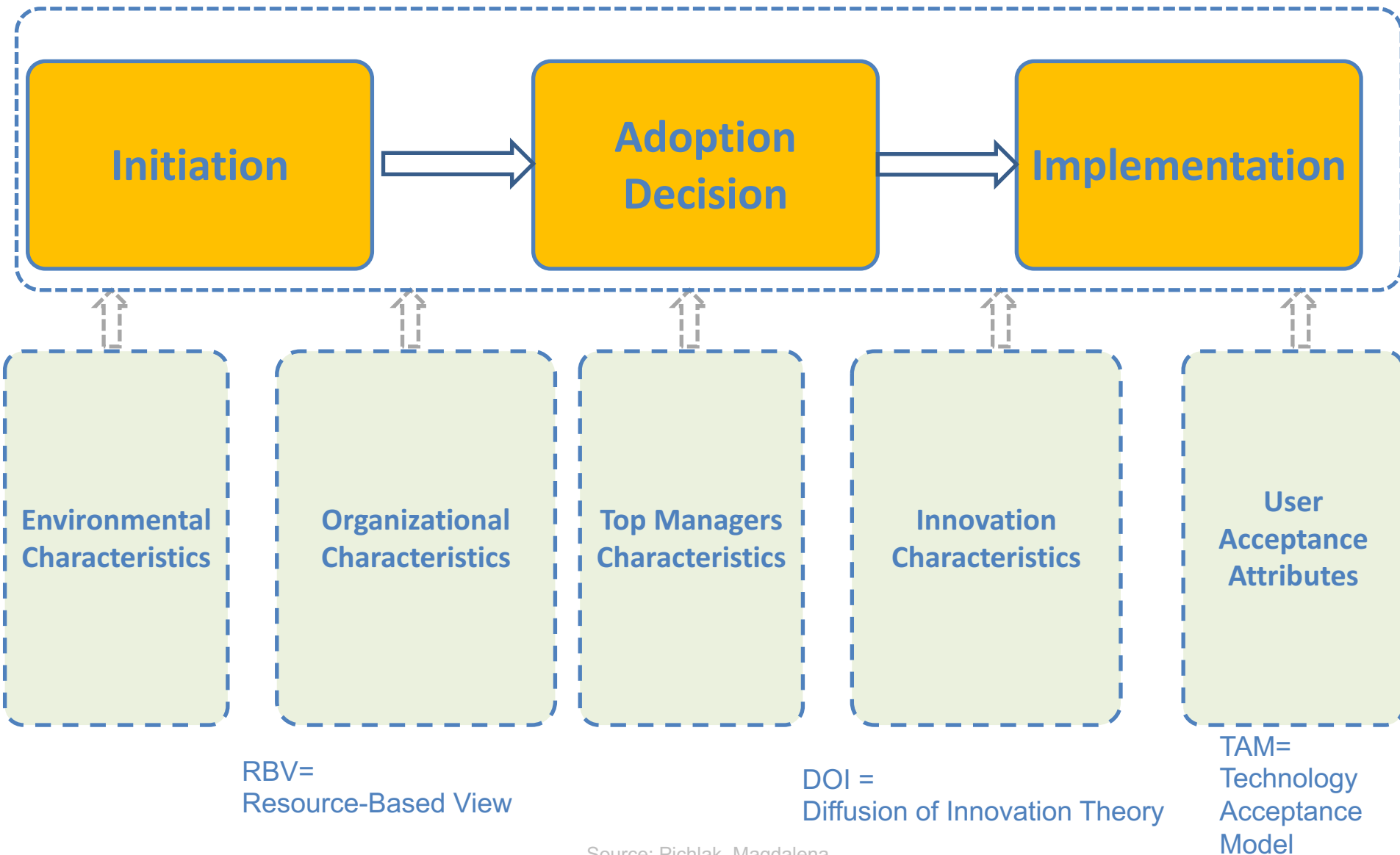
Innovation Adoption Process



Source: Pichlak, Magdalena.

"The innovation adoption process: A multidimensional approach." Journal of Management and Organization 22, no. 4 (2016): 476.

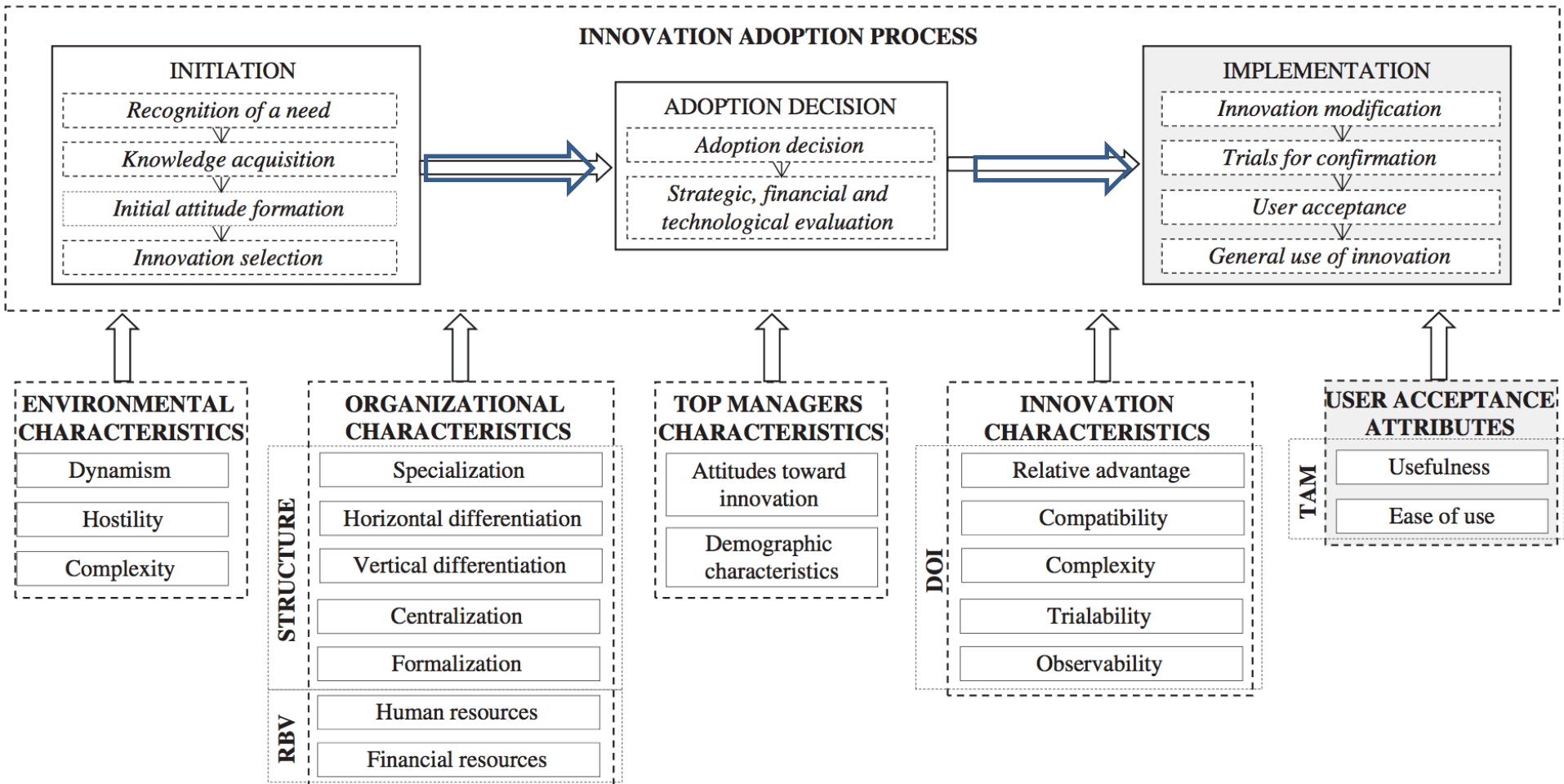
Innovation Adoption Process



Source: Pichlak, Magdalena.

"The innovation adoption process: A multidimensional approach." Journal of Management and Organization 22, no. 4 (2016): 476.

Innovation Adoption Process



RBV=
Resource-Based View

DOI =
Diffusion of Innovation Theory

TAM=
Technology
Acceptance
Model

Source: Pichlak, Magdalena.

"The innovation adoption process: A multidimensional approach." Journal of Management and Organization 22, no. 4 (2016): 476.

Innovation Adoption Process

Factors		Initiation					Adoption decision					Implementation				
		Mean	Me	Q3	Q1	QD	Mean	Me	Q3	Q1	QD	Mean	Me	Q3	Q1	QD
Environmental characteristics	Dynamism	3.4	3	4	2.75	0.625	3.6	4	4	3	0.5	4	4	5	4	0.5
	Hostility	3.3	3	4.25	3	0.625	3.9	4	4.25	3.75	0.25	3.7	4	4.5	3.5	0.5
	Complexity	4.5	5	5	4	0.5	3.2	3	4	2.75	0.625	3.3	3	4.25	3	0.625
Organizational characteristics	Specialization	3.8	4	4.25	3.75	0.25	2.9	3	4	2	1	2	2	3.25	2	0.625
	Horizontal differentiation	2.8	3	3.75	2.75	0.5	2.7	3	3.5	2	0.75	2	2	3.5	2	0.75
	Vertical differentiation	2.1	2	3.25	2	0.625	3.3	3	4	2.5	0.75	3.1	3	4	2.75	0.625
	Centralization	2	2	3.25	2	0.625	3.8	4	4.25	3.75	0.25	3.9	4	4.25	3.75	0.25
	Formalization	2.1	2	3	1.75	0.625	3	3	4.25	3	0.625	3.3	3	4	3	0.5
	Human resources	4.9	5	5	4.5	0.25	4	4	5	4	0.5	4.1	4	5	4	0.5
	Financial resources	3.2	3	4	2.5	0.75	4.1	4	4.25	3.75	0.25	4.8	5	5	4	0.5
	Top managers attitude towards innovation	4.1	4	4.5	4	0.25	3.9	4	4.25	3.75	0.25	4	4	4.5	3.5	0.5
Top managers characteristics	Top managers demographic characteristics	2.3	2	3.25	1.75	0.75	2	2.5	3	1	1	2.2	2	3	1.5	0.75
	Relative advantage	3	3	4	2.75	0.625	4.4	4.5	5	4	0.5	3.1	3	4	2.75	0.625
Innovation characteristics	Compatibility	2.8	3	3.5	2	0.75	3.9	4	4.25	3.75	0.25	3.9	4	4.25	3.75	0.25
	Complexity	3.6	4	4.25	3.75	0.25	3.8	4	4	3.75	0.125	3.9	4	4.25	3.75	0.25
	Trialability	3.2	3	4	2.75	0.625	3.1	3	4	2.5	0.75	4.1	4	5	4	0.5
	Observability	3.4	3.5	4.25	3	0.625	3.1	3.5	4	2	1	3.3	3	4.25	3	0.625
User acceptance attributes	Usefulness											3.2	3	4	2	1
	Ease of use											4	4	5	4	0.5

Note.
Me = median; Q = quartile; QD = quartile deviation.

Innovation Adoption Process

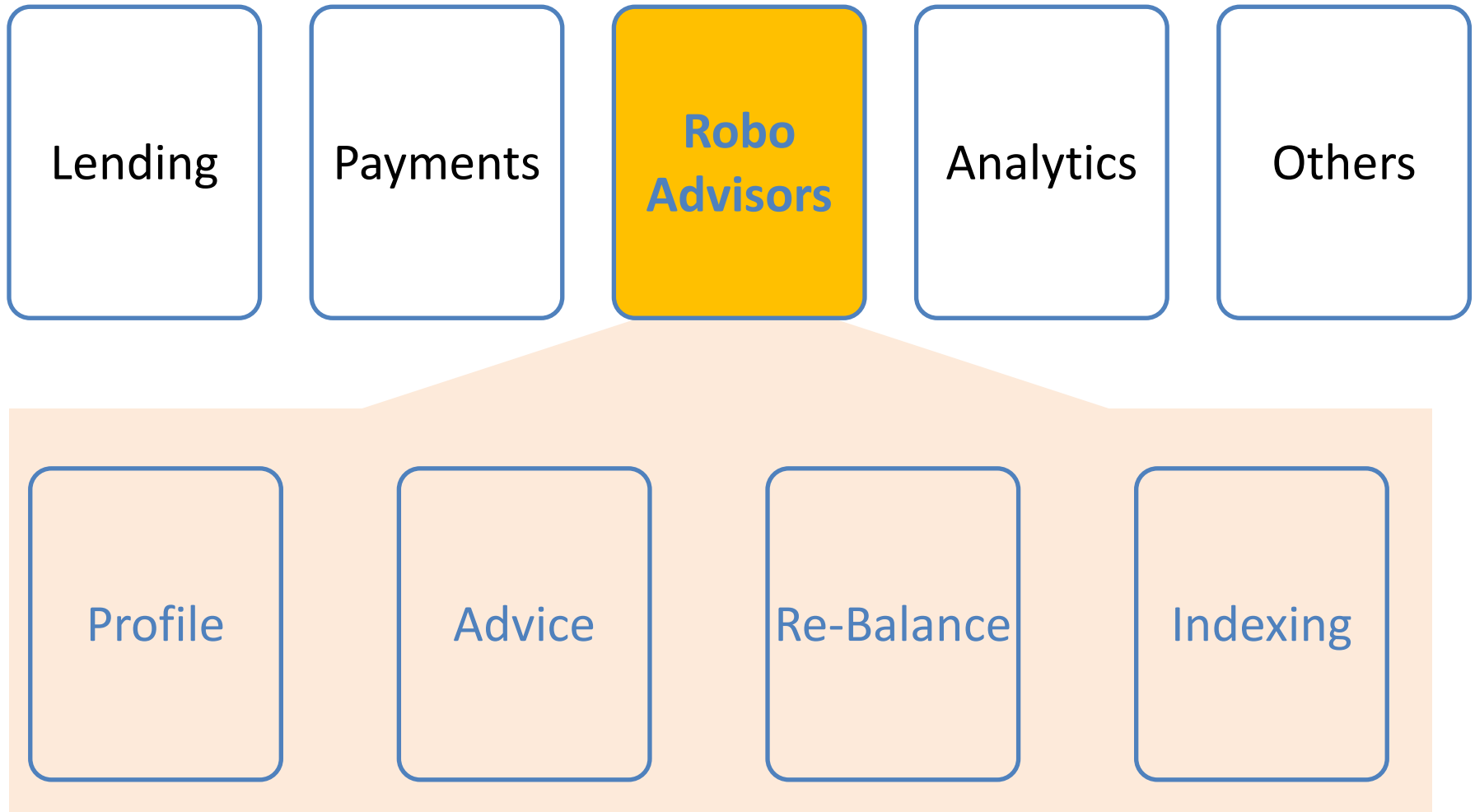
Initiation			Adoption decision			Implementation		
Factors	Round 1	Round 2	Factors	Round 1	Round 2	Factors	Round 1	Round 2
Complexity in the environment	4.5	4.2	Dynamism in the environment	3.6	3.4	Dynamism in the environment	4.0	3.8
Specialization	3.8	3.4	Hostility in the environment	3.9	4.0	Hostility in the environment	3.7	3.4
Horizontal differentiation	2.8	3.1	Centralization	3.8	3.8	Centralization	3.9	3.8
Human resources	4.9	5.0	Human resources	4.0	4.2	Formalization	3.3	3.2
Top managers attitude towards innovation	4.1	4.3	Financial resources	4.1	4.4	Human resources	4.1	4.4
Innovation complexity	3.6	3.3	Top managers attitude towards innovation	3.9	4.0	Financial resources	4.8	5.0
			Relative advantage	4.4	4.1	Top managers attitude towards innovation	4.0	4.4
			Innovation compatibility	3.9	3.6	Innovation compatibility	3.9	3.8
			Innovation complexity	3.8	3.8	Innovation complexity	3.9	3.9
						Innovation trialability	4.1	3.9
						Ease of use	4.0	4.2

Source: Pichlak, Magdalena.

"The innovation adoption process: A multidimensional approach." Journal of Management and Organization 22, no. 4 (2016): 476.

FinTech Innovation

FinTech high-level classification



FinTech: Financial Services Innovation



FinTech:

Financial Services Innovation

- 1. Payments**
- 2. Insurance**
- 3. Deposits & Lending**
- 4. Capital Raising**
- 5. Investment Management**
- 6. Market Provisioning**



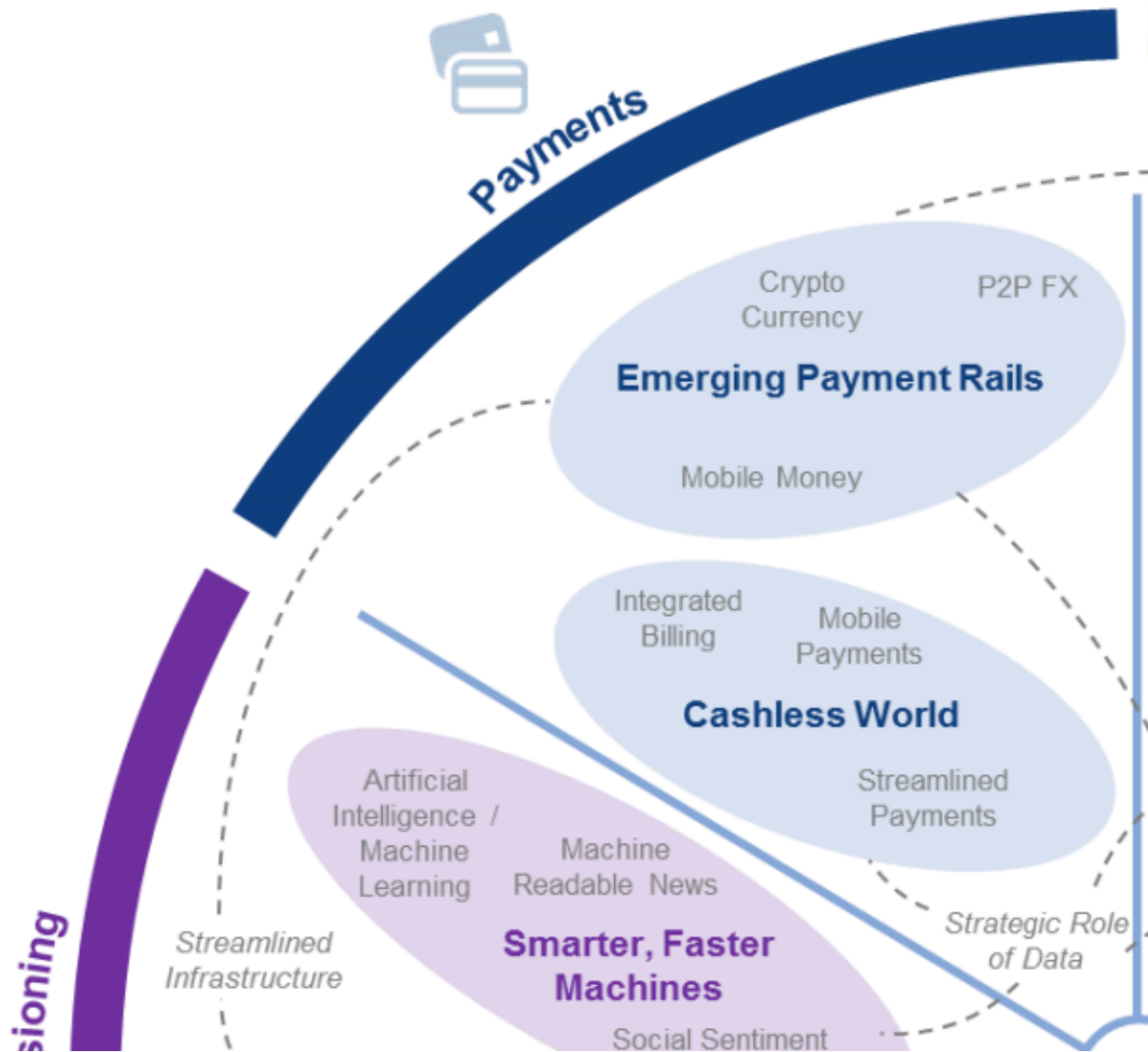
圖表來源：世界經濟論壇

FinTech: Financial Services Innovation

功能	創新項目
 支付 Payments	無現金世界 (Cashless World) 新興支付 (Emerging Payment Rails)
 保險 Insurance	價值鏈裂解 (Insurance Disaggregation) 保險串接裝置 (Connected Insurance)
 存貸 Deposit & Lending	替代管道 (Alternative Lending) 通路偏好移轉 (Shifting Customer Preferences)
 籌資 Capital Raising	群眾募資 (Crowdfunding)
 投資管理 Investment Management	賦權投資者 (Empowered Investors) 流程外部化 (Process Externalisation)
 市場資訊供應 Market Provisioning	機器革命 (Smarter, Faster Machines) 新興平台 (New Market Platforms)

圖表來源：Fugle團隊整理

FinTech: Payment

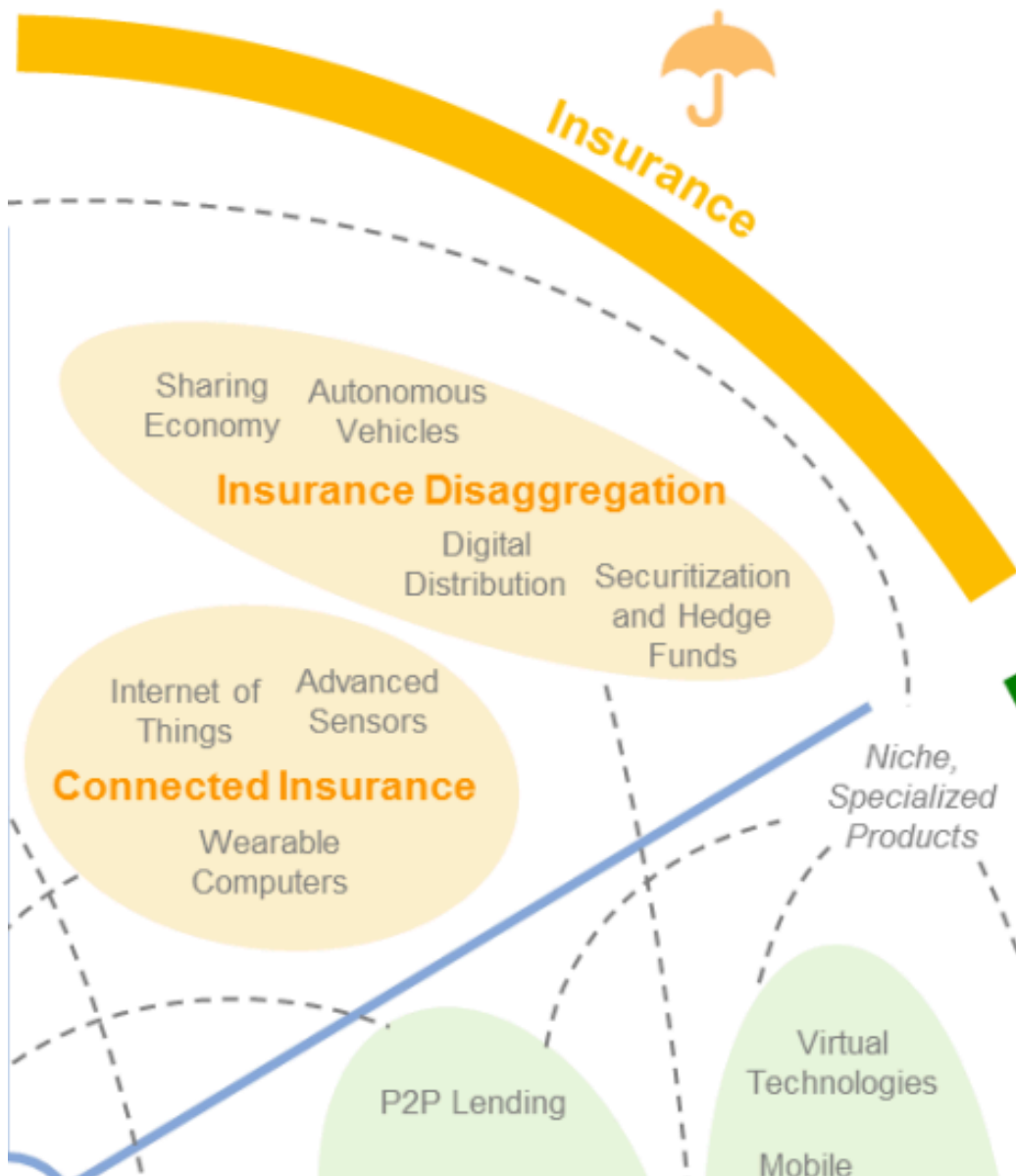


FinTech: Payment Cashless World Emerging Payment Rails



圖表來源：Fugle團隊整理

FinTech: Insurance



FinTech: Insurance

Insurance Disaggregation

Connected Insurance

保險



創新

關鍵趨勢

價值鏈裂解
Insurance
Disaggregation

裂解分佈 (Disaggregated Distribution)、共享
經濟、第三方資本、自動駕駛車

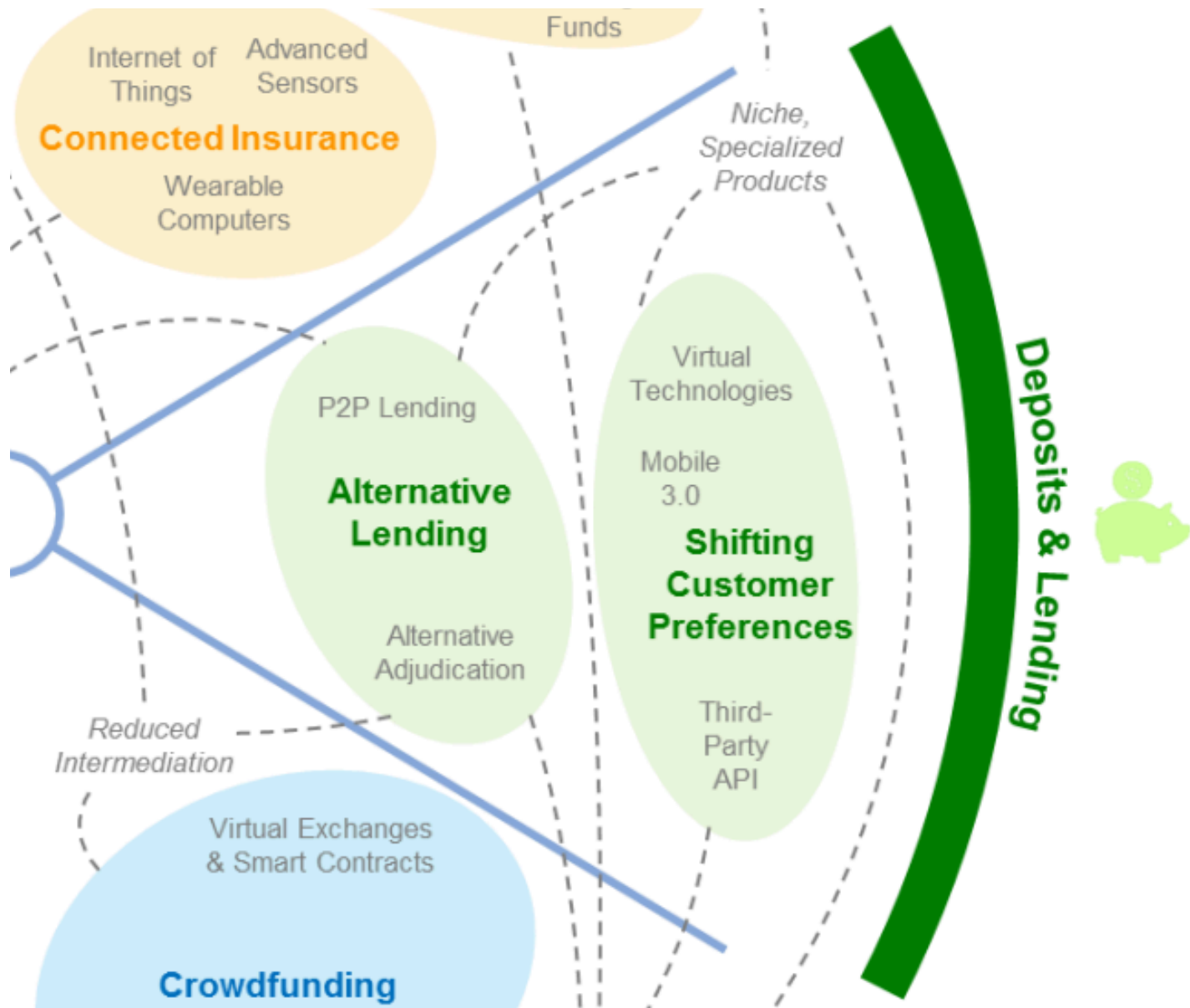
保險串接裝置
Connected
Insurance

高性價比感測器、穿戴式裝置、物聯網、標
準化平台

圖表來源：Fugle團隊整理

3

FinTech: Deposits & Lending



3

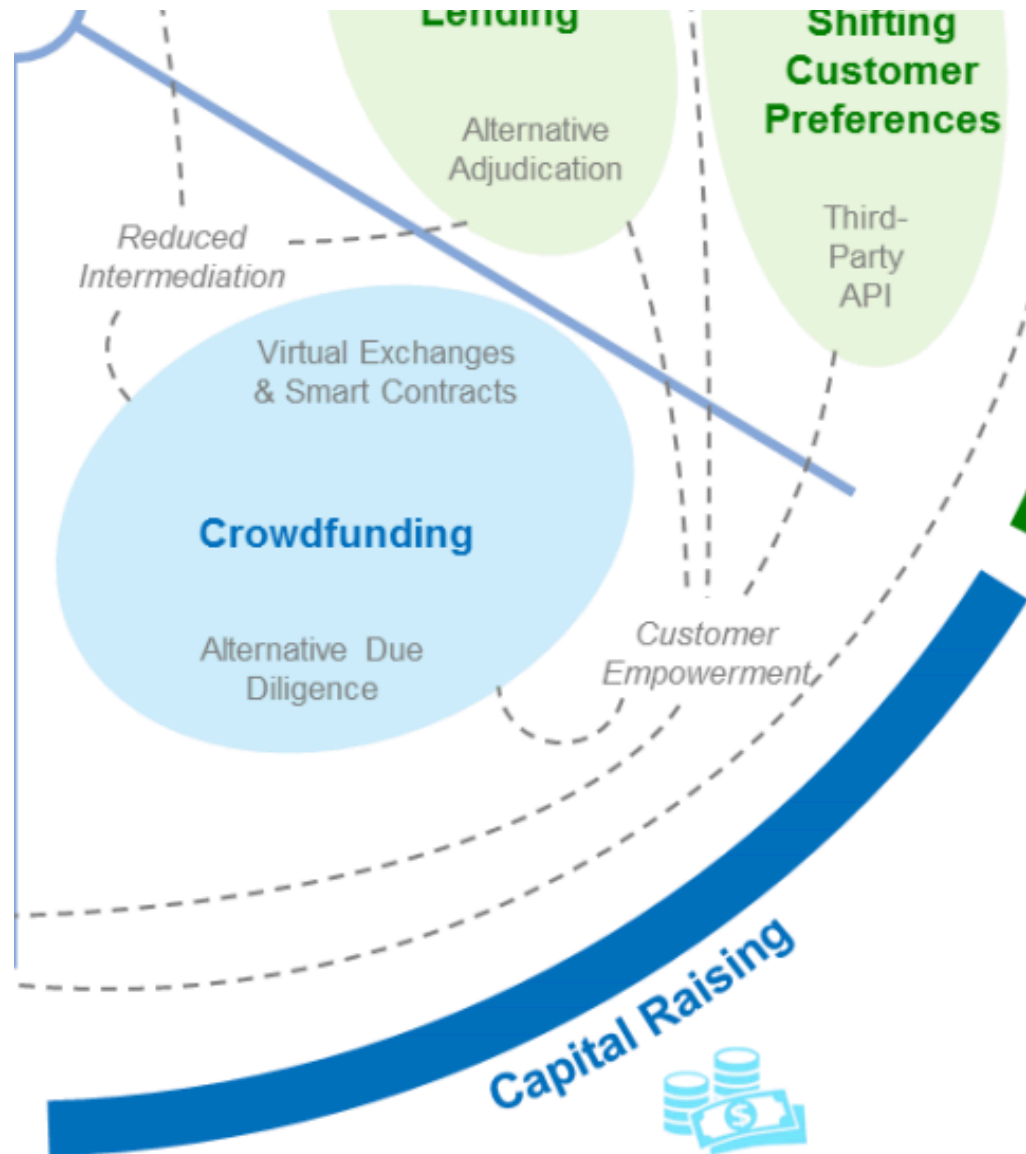
FinTech: Deposits & Lending Alternative Lending Shifting Customer Preferences



圖表來源：Fugle團隊整理

4

FinTech: Capital Raising



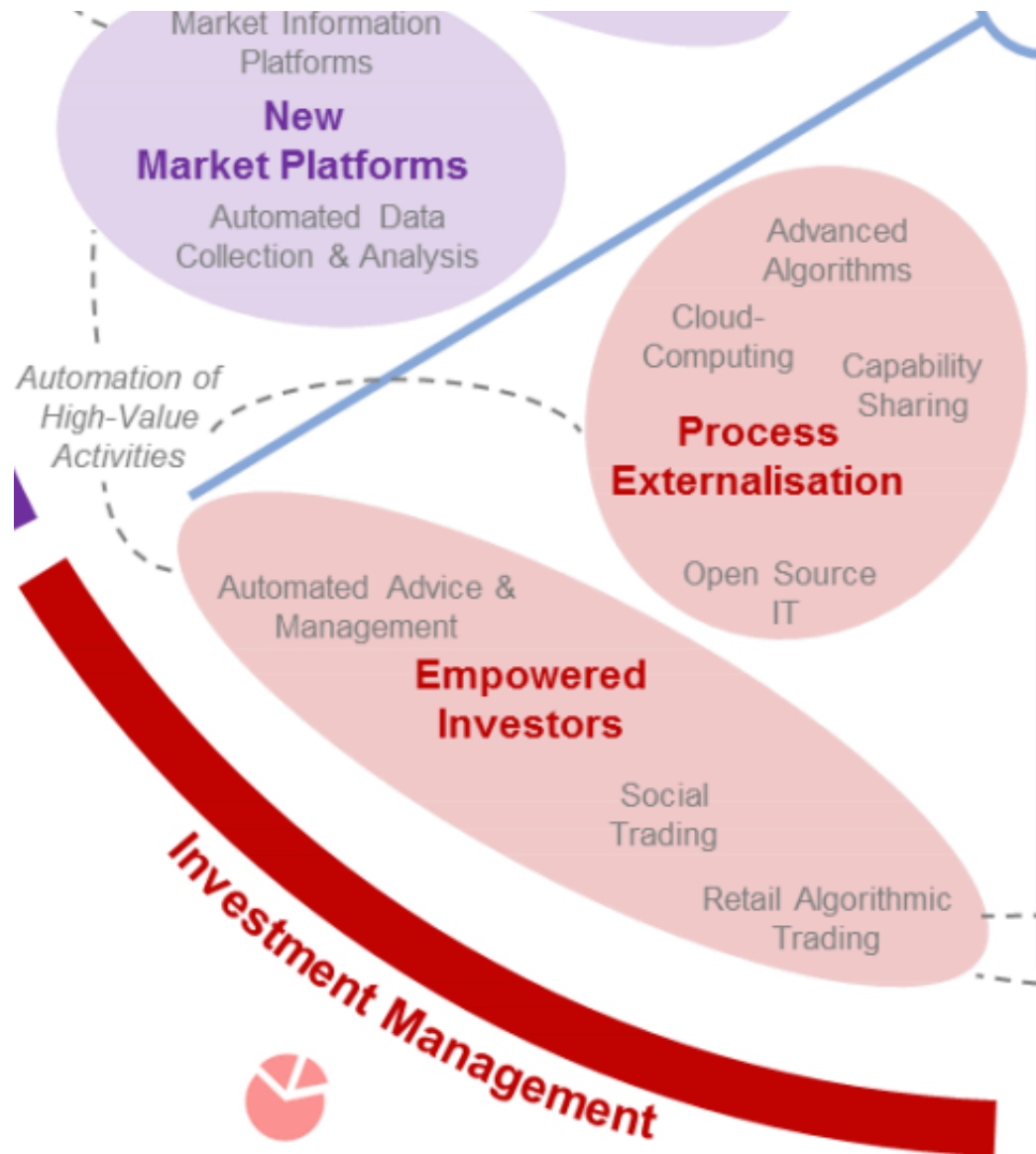
4

FinTech: Capital Raising Crowdfunding



圖表來源：Fugle團隊整理

5 FinTech: Investment Management



5 FinTech: Investment Management

Empowered Investors

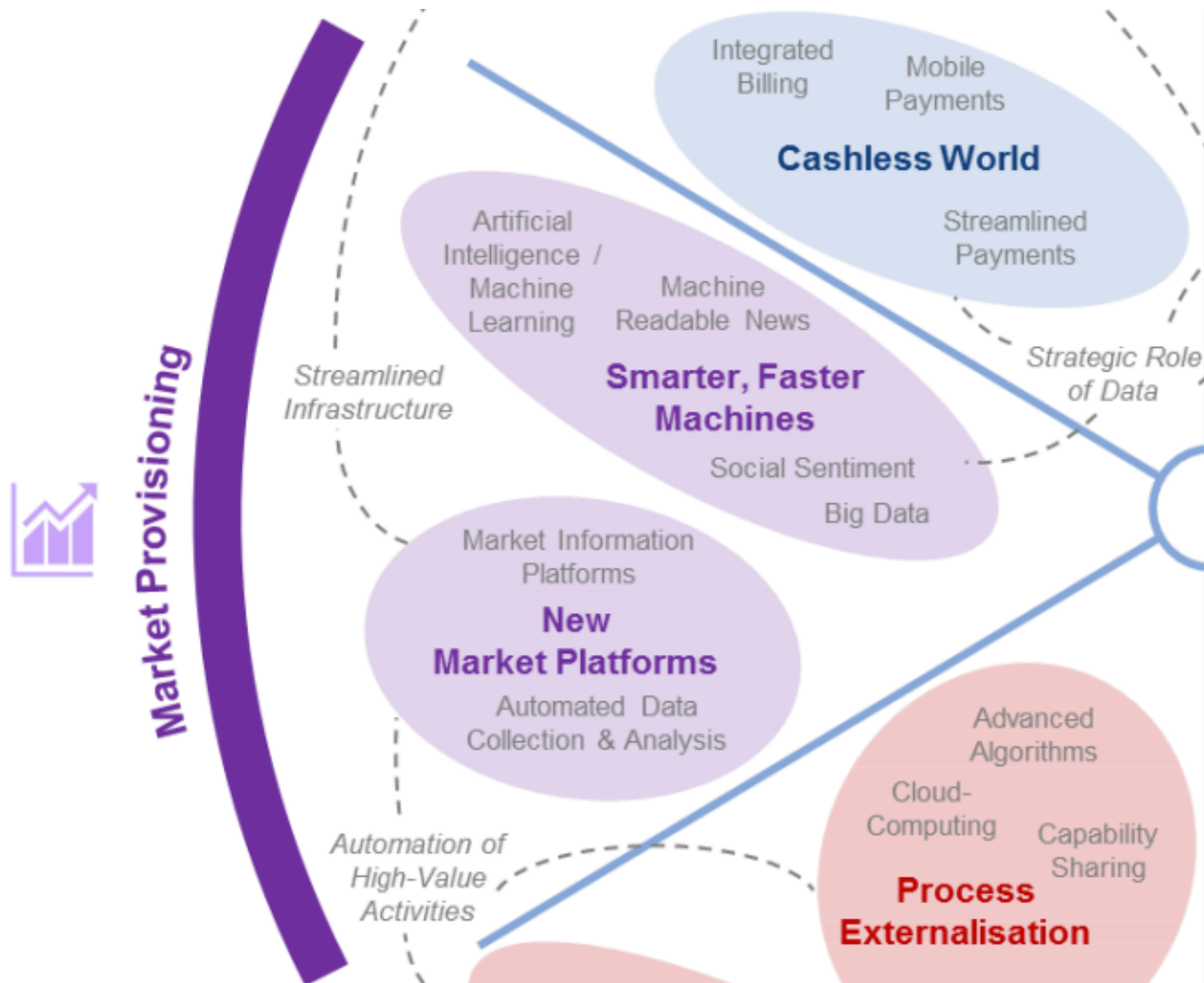
Process Externalization



圖表來源：Fugle團隊整理

6

FinTech: Market Provisioning



6

FinTech: Market Provisioning Smarter, Faster Machines New Market Platforms

市場資訊供應



創新

關鍵趨勢

機器革命
Smarter, Faster
Machines

機器易用數據 (Machine Accessible Data)、人工智慧 / 機器學習、大數據

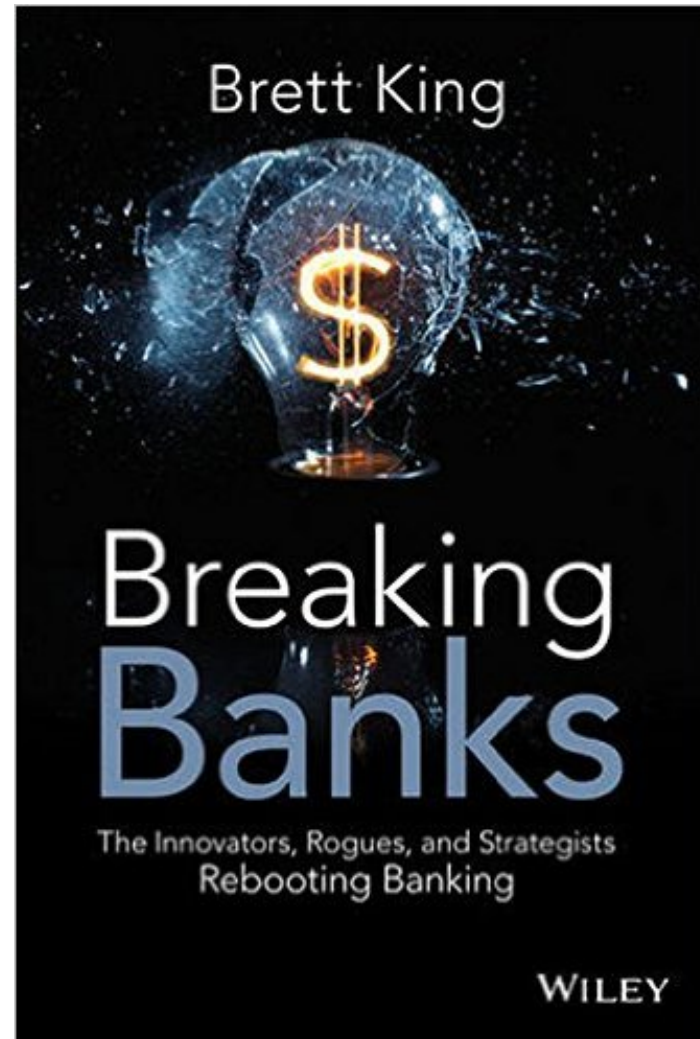
新興平台
New Market
Platforms

固定收益商品平台 ALGOMI、基金 / 組合型基金平台 NOVUS、私募 / 創投平台 BISON、未公發股權平台 LIQUITY、原物料商品與衍生性合約平台 ClauseMatch

圖表來源：Fugle團隊整理

Brett King (2014),
Breaking Banks:

The Innovators, Rogues, and Strategists Rebooting Banking
Wiley



**“In the next 10 years,
we'll see more
disruption and changes
to the banking and
financial industry
than we've seen in the
preceding 100 years.”**

(Brett King, 2014)

Fintech: Financial Technology

Disrupting Banking: The Fintech Startups That Are Unbundling Wells Fargo, Citi and Bank of America

Fintech: Unbundling the Bank

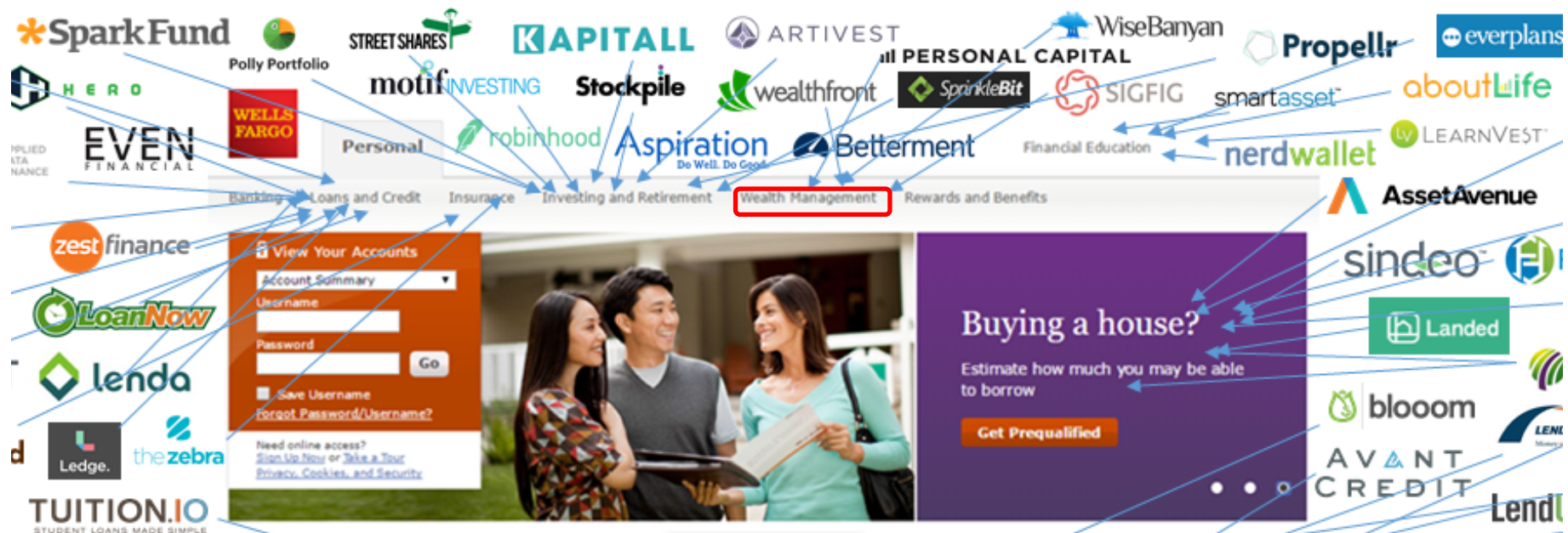
Unbundling of a Bank



Fintech: Unbundling the Bank

Wealth Management: Wealthfront

Unbundling of a Bank



Fintech: Financial Technology

Disrupting

European Banking:

The FinTech Startups

That Are Unbundling

HSBC, Santander, and

BNP

Unbundling of a European Bank

The image illustrates the unbundling of a European bank, specifically HSBC, into various fintech services. The central focus is the HSBC website, which is surrounded by numerous other financial services. Arrows point from various logos to specific sections of the HSBC website, showing how different services are being unbundled.

Logos and Services:

- Top Row:** SavingGlobal, borro, Bondora, Zopa, Lending Works, prêt d'union, Lendico, fruitful, LANDBAY, Property Partner, wonga, Spotcap, Funding Circle, FINEXKAP, fleximize, iwoca, capiota, HOLVI, Trade River, Ebury, Lydia, jusp, ensygnio, payleven.
- Second Row:** ffrees, osper, CENTRALWAY, SQUIRREL, nutmeg, wikifolio, eToro, tink, CAPITAL, Money Dashboard, moni, transferGo, worldremit, azimo, CurrencyFair, Klarna, adyen, sum up, iZettle, BILLPAY, GOCARDLESS, PAYMILL.
- Central HSBC Website:**
 - Personal / Business:** Everyday banking, Borrowing, Investing, Insurance, Planning.
 - Send money overseas in a few clicks:** It's secure, quick and easy. See just how much we could save you. Fees may apply. Payments may also incur agency and/or beneficiary bank fees. [Find out more](#)
 - Find a mortgage:** Our lowest ever loan rate.
 - Save Together offer:** International money transfer.
 - Business Banking:** Business Banking (Turnover up to £2m), Commercial Banking (Turnover £2m to £30m), Corporate Banking (Turnover in excess of £30m), International Business, Online Services.
 - Discover products and services for your banking needs:**
 - Community account, Other accounts, Finance & borrowing, Credit cards & debit cards, Payment services, Business insurance policies, Business savings & investments, Ways to Bank, International business, Pensions.
 - Get in touch:** Have a query? There are lots of ways we can help you feel you're making the right choice. Call us on 0800 731 8904. Find a branch and book an appointment. Retrieve application. Retrieve an online application you have already started.

Unbundling of a European Bank

The image illustrates the concept of 'unbundling' a European bank into specialized fintech services. It features a central screenshot of the HSBC website, with various fintech logos surrounding it, each connected to a specific service on the website by yellow arrows.

Logos on the left side (connected to Personal/Business navigation):

- SavingGlobal
- borro
- Bondora
- zopa
- LENDING WORKS
- prêt d'union
- Lendico
- fruitful
- LANDBAY
- Property Partner
- wonga.com

Logos at the top (connected to navigation and search):

- ffrees
- osper
- CENTRALWAY
- SQUIRREL
- nutmeg
- wikifolio
- etoro
- tink

Logos on the right side (connected to specific services):

- CAPITAL
- Money Dashboard
- môni
- transferGo
- worldremit
- azimo
- CurrencyFair
- Klarna
- adyen

Central Website Screenshot (HSBC):

- Navigation:** Personal | Business | Search | Internet Banking | Log on | Register >
- Service Categories:**
 - Everyday banking (Accounts & services)
 - Borrowing (Loans & mortgages)
 - Investing (Products & analysis)
 - Insurance (Property & family)
 - Planning (for now & the future)
- Main Banner:** "Send money overseas in a few clicks. It's secure, quick and easy. See just how much we could save you. Find out more." (Connected to "International money transfer" service)
- Footer/Bottom Section:**
 - Find a mortgage (Connected to "Find a mortgage" service)
 - Our lowest ever loan rate (Connected to "Our lowest ever loan rate" service)
 - Save Together offer (Connected to "Save Together offer" service)
 - International money transfer (Connected to "International money transfer" service)
- Bottom Navigation:** Personal | Business | Business Banking (Turnover up to £2m) | Commercial Banking (Turnover £2m to £30m) | Corporate Banking (Turnover in excess of £30m) | International Business | Online Services
- Logos at the bottom:** LendInvest, HSBC, auxmoney, the currency cloud, lendstar, TransferWise, CB INSIGHTS, and the slogan "Every business has its own story".

Financial Technology (Fintech) Categories

1. Banking Infrastructure
2. Business Lending
3. Consumer and Commercial Banking
4. Consumer Lending
5. Consumer Payments
6. Crowdfunding
7. Equity Financing
8. Financial Research and Data
9. Financial Transaction Security
10. Institutional Investing
11. International Money Transfer
12. Payments Backend and Infrastructure
13. Personal Finance
14. Point of Sale Payments
15. Retail Investing
16. Small and Medium Business Tools

FinTech Ecosystem (April 2015)



FinTech
1,072 Companies

Contact
info@venturescanner.com
to see all companies

 **Venture Scanner**

Financial Technology (FinTech)

THE FINTECH ECOSYSTEM

ROBO-ADVISORS & PERSONAL FINANCE



BLOCKCHAIN & BITCOIN



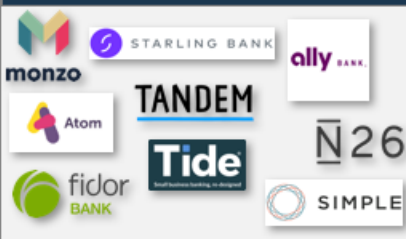
INSURTECHS



REGTECHS



DIGITAL BANKS



ALTERNATIVE FINANCE



PAYMENTS & REMITTANCES



BI INTELLIGENCE

Source: Company websites, BI Intelligence

Financial Technology (FinTech)

THE FINTECH ECOSYSTEM

Payments & Transfers



Lending & Financing



Retail Banking



Financial Management



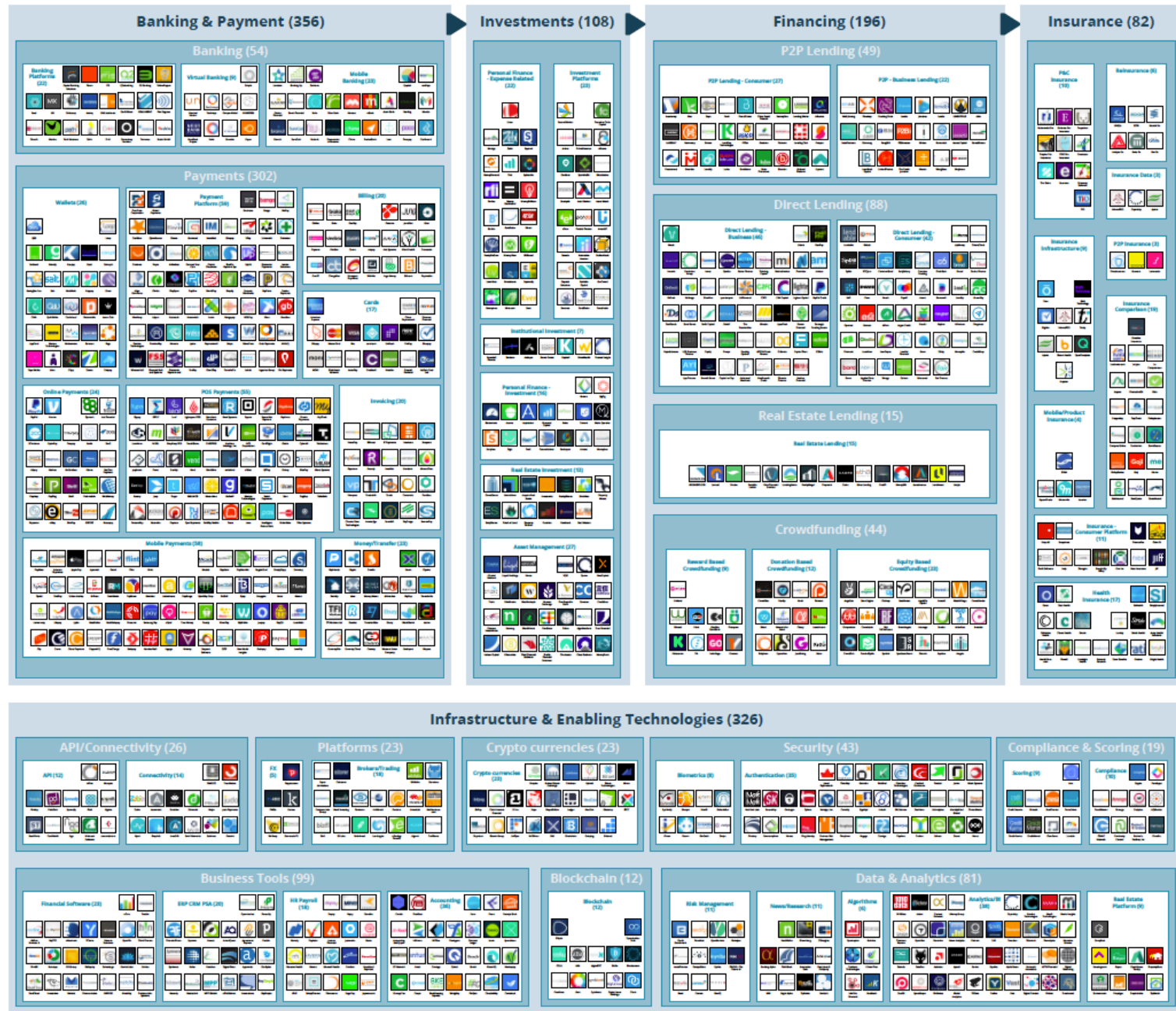
Insurance



Markets & Exchanges



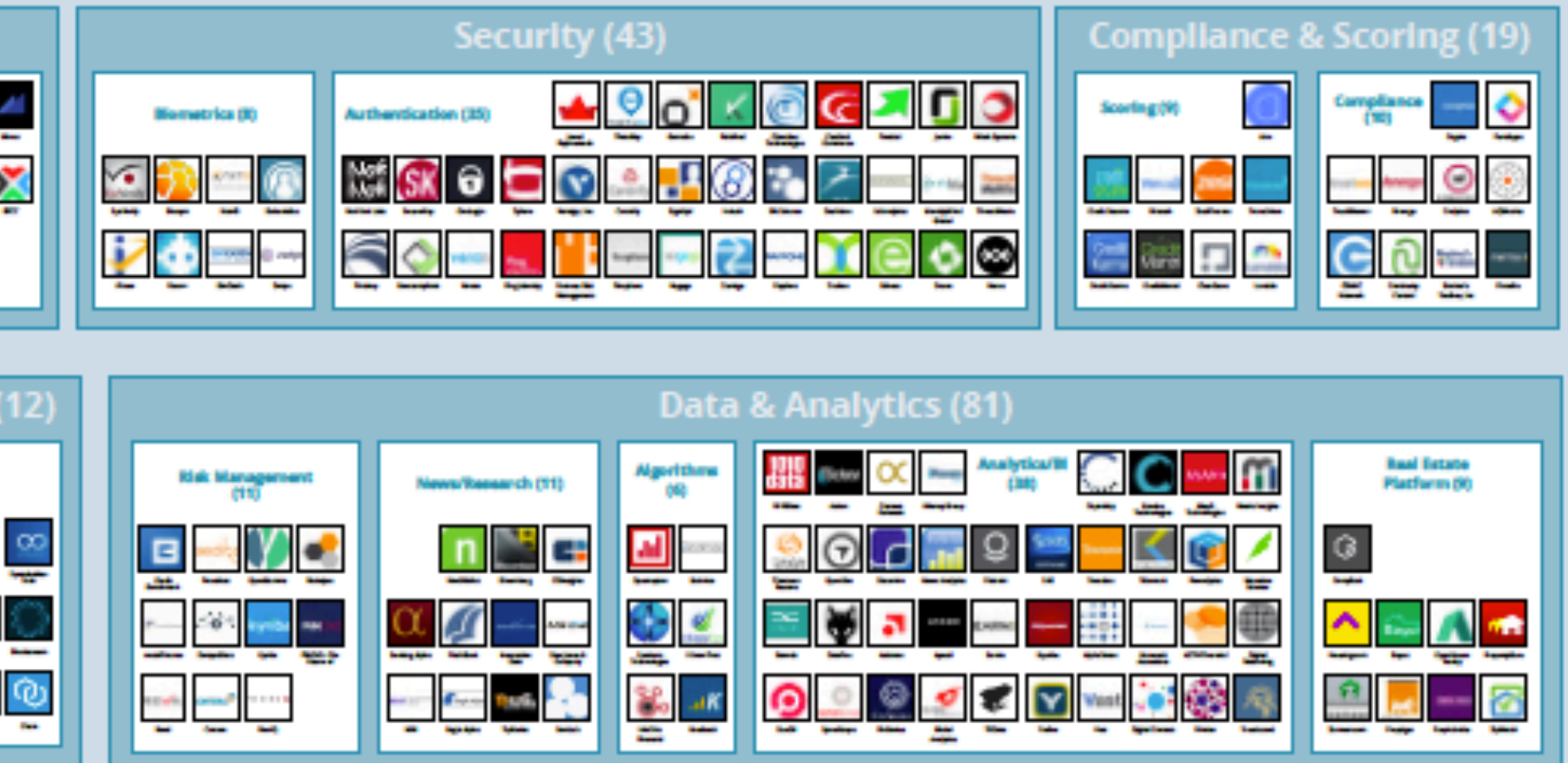
BI INTELLIGENCE



FinTech Landscape Enabling Technologies

Data & Analytics

Technologies (326)



FINTECH | LANDSCAPE

everisDigital

Digital & Mobile payments



Bitcoin & Cryptocurrency



Capital Markets & Investing



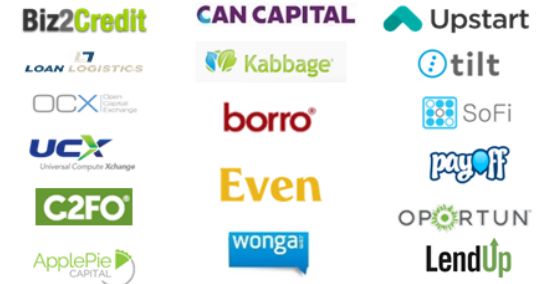
Banking & Corporate Finance



Big Data & Analytics



Financial platforms



Crowdfunding & peer-to-peer lending



Personal financial management



Blockchain technology



FinTech Startups Worldwide

Fintech Startups WorldWide

Bankcard Organization



Acquiring Service Provider



Prepaid Card Issuer



Software, Hardware and Device Provider



Online Payment Company



Telecom Operator



City Commercial Bank



Mobile Payment Company



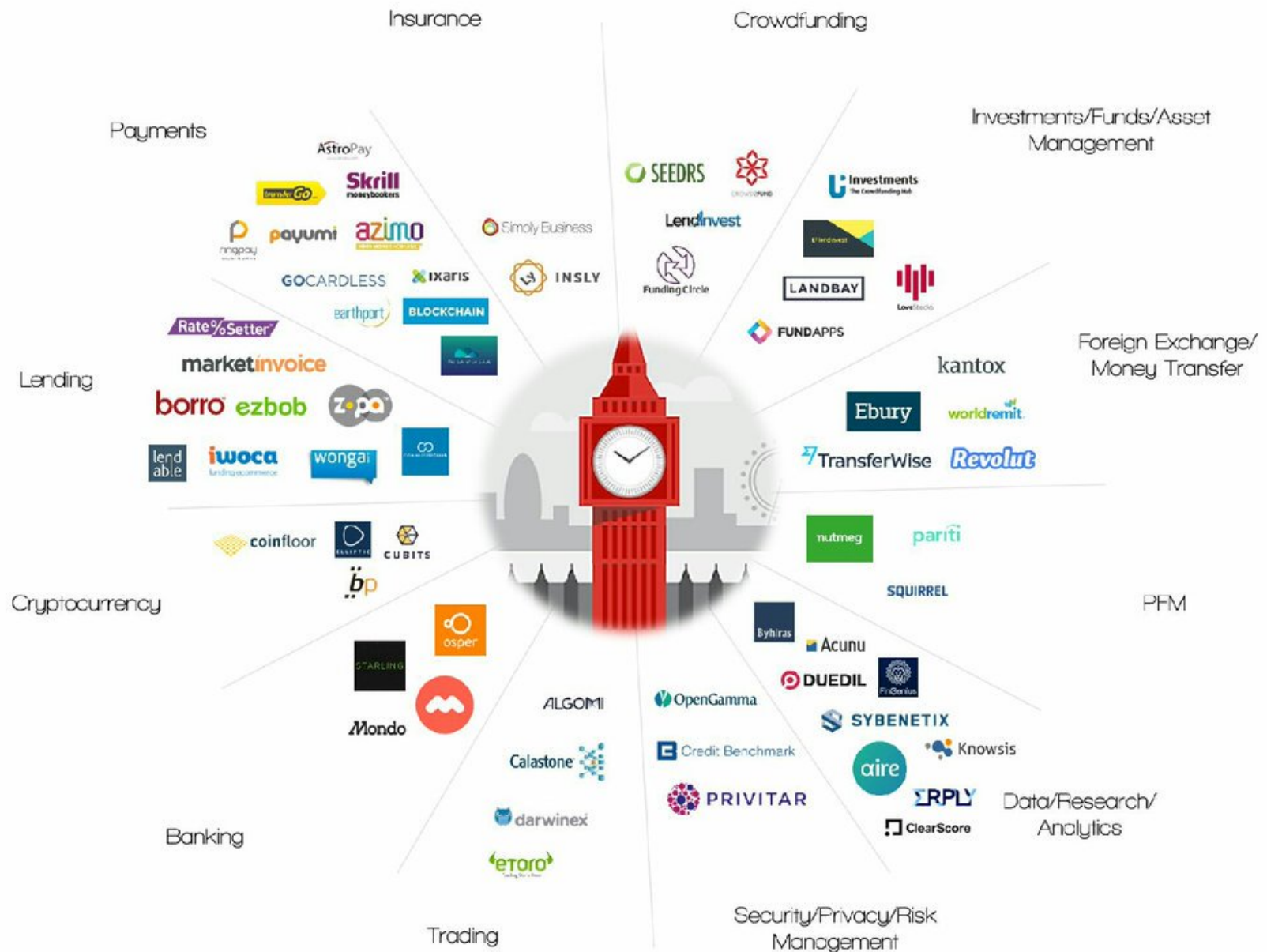
State-owned Bank



Joint-stock Bank



Fintech Startups WorldWide



Fintech Startups WorldWide



German FinTech Overview - Unbundling Banks

powered by www.paymentandbanking.com, March 2016

Fintech Startups WorldWide



Fintech Startups WorldWide

FinTech Map Switzerland

Juni 2016

#185

Investing und Asset Management

#45



Vergleichs- und Informationsportale, Beratung, Versicherung

#30



Payment

#27



Crowdfunding

#31



Crypto

#20



Daten Management

#13



PFM

#3



Andere

#16

FinTech Map

Juni 2016

swisscom

Fintech Startups WorldWide

決済



資産管理



資産運用



INSNEXT

お金のデザイン
MONEY DESIGN

ビットコイン



国内

FinTech
サービス19選

ソーシャルレンディング



Crowdcredit



AQUSH

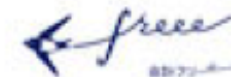
金融情報



SPEEDA



会計



Fintech Startups WorldWide

KOREAN FINTECH STARTUP MAP

Ver. 1.00

Payments



Bitcoin



Personal Finance



Remittances



Crowdfunding



Lending



Security



카테고리별 순서: 기업의 영문명 순서

PDF 파일을 다운 받고 스타트업의 로고를 클릭하면,
해당 스타트업의 홈페이지로 갈 수 있습니다.



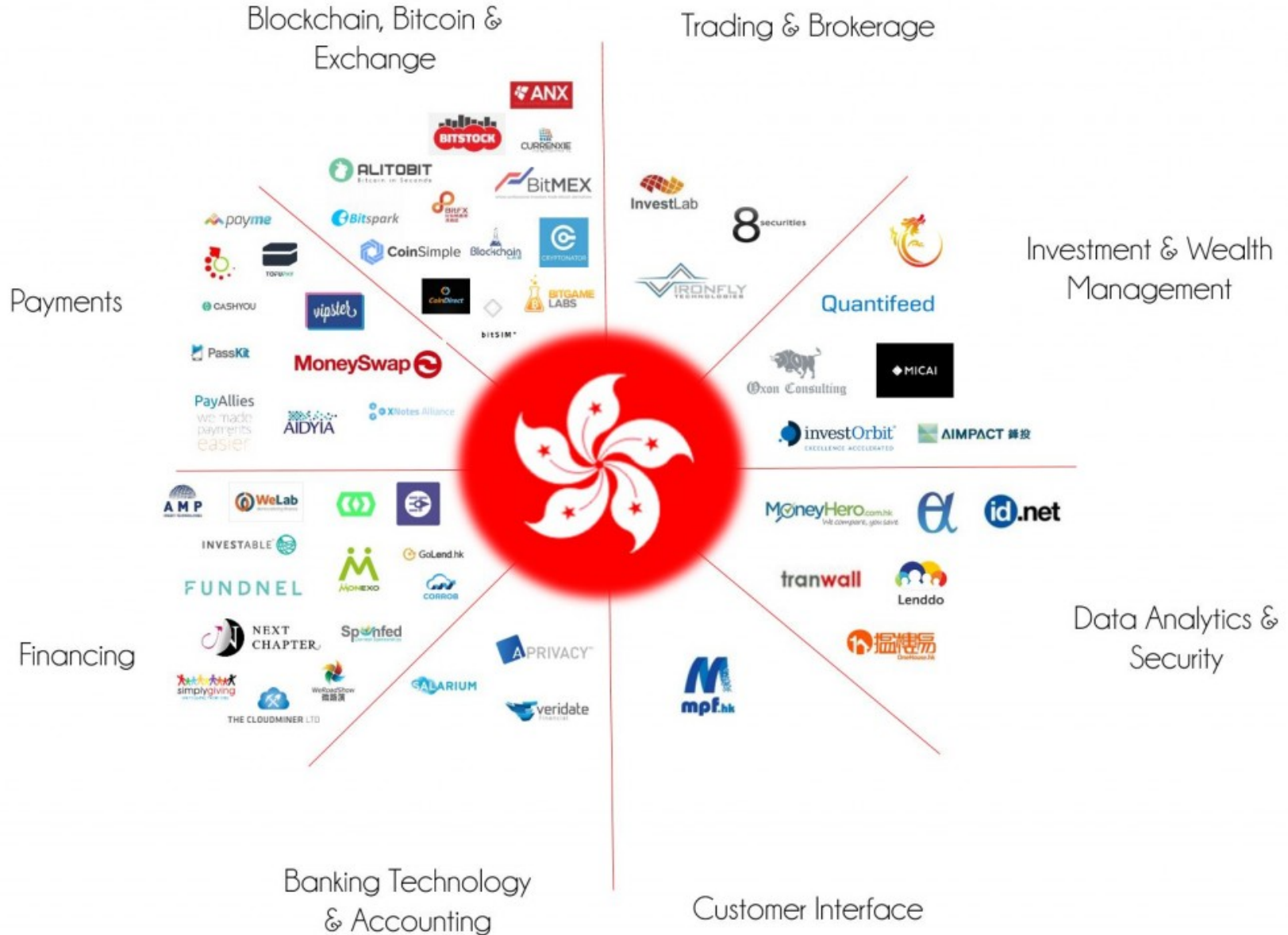
Fintech Startups WorldWide

Singapore FinTech Landscape



Payments / Remittances	Personal Finance/Wealth	Retail Banking/Investments	Banking Infrastructure
Lending	Institutional Investments	Financial Training / Games	Finance Research/Analytics

Fintech Startups WorldWide



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