

Measuring Global FINTECH Readiness

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Keywords

FINTECH, digital readiness, blockchain, cryptocurrency, rule-based, scores, maturity

Abstract

This paper presents a way to “score” FINTECH readiness-for-inclusiveness. A FINTECH country capability maturity model is developed to measure a country’s FINTECH readiness, especially as it involves cross-border payments, blockchain, smart contracts and cryptocurrency, among other current and emerging financial technologies. The model is then conceptually converted to rules-driven data base that scores FINTECH maturity and recommends what steps should be taken by countries that want to expand their FINTECH capabilities.

Introduction

Inclusiveness is a key FINTECH objective. Ideally, everyone can participate. But some countries, companies and banks will not be included in the revolution in financial technology already well underway. Their digital and emerging technology capabilities fall short. Their adoption of FINTECH technology is too slow. A transactional level of “maturity” is required for participation.

FINTECH Maturity

“FINTECH maturity” can be defined by a country’s digital infrastructure and its ability (and willingness) to adopt emerging digital technologies, especially those associated with FINTECH.

Countries that have a well-developed digital infrastructure – such as Sweden and Norway – can leverage FINTECH so long, of course, they are inclined to do so. That said, the correlation between highly developed digital countries and FINTECH adoption is predictably high, where the converse is unfortunately low.

In order for countries to leverage FINTECH, they must possess basic and always-improving digital infrastructure capabilities (broadband, cloud, big data, cybersecurity, etc.) simply because FINTECH requires a modern digital infrastructure (which can evolve, be leapfrogged or purchased). They must adopt FINTECH as both a process and a technology.

Digital Readiness

Several organizations and companies collect data about both digital infrastructures and emerging technology adoption. The World Economic Forum, for example, has developed the Network Readiness Index – the NRI – which assesses “countries’ ability to capitalize on the digital revolution and their preparedness to benefit from the emerging Fourth Industrial Revolution ... the Index aggregates data from 53 indicators ... networked readiness rests on whether a country possesses the drivers necessary for digital technologies to unleash their potential.” The NRI uses 4 broad drivers with a subset of 53 indicators (World Economic Forum, 2016):

Environment

1. Political and regulatory environment (9 indicators)
2. Business and innovation environment (9 indicators)

Readiness

3. Infrastructure (4 indicators)
4. Affordability (3 indicators)
5. Skills (4 indicators)

Usage

6. Individual usage (7 indicators)
7. Business usage (6 indicators)
8. Government usage (3 indicators)

Impact

9. Economic impacts (4 indicators)
10. Social impacts (4 indicators)

Another example is the Digital Evolution Index (DEI) developed at the Fletcher School at Tufts University (with help from *Mastercard* and *DataCash*). The DEI uses four broad clusters of indicators (Chakravorti and Chaturvedi, 2017):

“Supply-Side Factors (including access, fulfillment, and transactions infra-structure)

Demand-Side Factors (including consumer behaviors and trends, financial and Internet and social media savviness)

“Innovations (including the entrepreneurial, technological and funding eco-systems, presence and extent of disruptive forces and the presence of a start-up culture and mindset)

“Institutions (including government effectiveness and its role in business, laws and regulations and promoting the digital ecosystem)”

Countries are scored across these four sets of indicators to measure their digital prowess.

Yet another approach is CISCO’s digital readiness scoring methodology which identifies three stages of digital readiness: *“activate (the lowest stage of digital readiness), accelerate (countries in the middle stage) and amplify (those in the highest stage of digital readiness). Countries in the Activate stage are just starting out in their digital journey ... countries in the Accelerate stage of digital readiness scored in the middle range with some component scores having room for improvement ... countries at the highest stage of digital readiness include the United States, many countries in Western Europe, and some in Asia, such as Singapore, Japan, and Australia.”*

The indicators include:

- Maturity of the Technology Infrastructure
- Pace of Technology Adoption
- Availability of Human Capital
- Fulfillment of Society’s Basic Needs
- Ease of Doing Business
- Amount of Business & Government Investment
- Maturity of a Country’s Start-Up Culture

Cisco found that digital readiness scores averaged 11.96, along a 0 – 25 scale. The scores ranged between 5.9 and 20.1. 118 countries were scored.

All three of these methods collect and interpret data and score/rank a country’s ability to compete in an increasingly digital world. The scores and ranks are the first driver of a country’s FINTECH maturity. The second driver is a country’s commitment to the adoption of current and emerging financial technology, though without a solid digital infrastructure country cannot expect adopt and leverage FINTECH.

Current & Emerging FINTECH Adoption

The second set of FINTECH maturity drivers include investments in emerging technologies that enable FINTECH, as well as a specific commitment to the development of FINTECH capabilities.

FINTECH is a *“new tech that seeks to improve and automate the delivery and use of financial services. At its core, fintech is utilized to help ... manage ... financial operations, processes and lives by utilizing specialized software and algorithms that are used on computers and, increasingly, smartphones (Kagan, 2019). Countries need to commit to the adoption and deployment of FINTECH as part of their digital maturity and in order to compete in an increasingly FINTECH-active world.*

Lists of FINTECH technologies usually include (Kagan, 2019):

- Cryptocurrency/Digital Cash

Blockchain
 Open Banking
 Insurtech
 Smart Contracts
 Regtech
 Underbanked Services
 Robo-Advisors
 Cybersecurity

Emerging FINTECH technology adoption is the second driver of FINTECH maturity. Research tells us that FINTECH technology adoption rates vary widely across countries. EY, for example, has developed an approach to measuring FINTECH adoption (Gulamhuseinwala, Hatch and Lloyd, 2017).

EY has identified five categories and 17 indicators to measure a country's FINTECH adoption. Note how far along China (69%) and India (52%) are against an average 33% adoption rate:

Money Transfers & Payments

Online foreign exchange
 Pay via cryptocurrency
 Overseas remittances
 Online digital-only banks without branches
 Nonbanks to transfer money
 Mobile phone payment at checkout

Financial Planning

Online budgeting & financial planning tools
 Savings & Investments
 P2P platforms for high-interest investments
 Investments in equity crowdfunding platforms & rewards crowdsourcing platforms
 Online investment advice & investment management
 Online stockbroking
 Spreadbetting

Borrowing

Borrowing using P2P platforms
 Borrowing using online short-term loan payments

Insurance

Car insurance using telematics (black box)
 Insurance premium comparison sites
 Activity-based health insurance that tracks your exercise

Here are some of the FINTECH adoption rates (Gulamhuseinwala, Hatch and Lloyd, 2017):

China (69%)
 India (52%)
 UK (42%)
 Brazil (40%)
 Australia (37%)
 Spain (37%)
 Mexico (36%)
 Germany (35%)
 South Africa (35%)
 (Average = 33%)
 USA (33%)
 Hong Kong (32%)
 South Korea (32%)
 Switzerland (30%)
 France (27%)

Netherlands (27%)
 Ireland (26%)
 Singapore (23%)
 Canada (18%)
 Japan (14%)

Global FINTECH adoption rates can be tracked over time. Countries that are well on their way will be “included” in the FINTECH revolution, while those resisting FINTECH, or are unable to adopt FINTECH because of their weak digital infrastructures, will find themselves unable to participate in financial transactions of all kinds.

A FINTECH Capability Maturity Model

Digital readiness and FINTECH adoption define the overall FINTECH maturity score. The objective is to develop a real-time FINTECH maturity score with input from multiple digital readiness and FINTECH adoption data bases, scores and rankings. Readiness and adoption data should be normalized following a qualitative/quantitative rationalization of the indicators used to score digital readiness (from approved collection organizations). An initial look at the key readiness indicators would directly measure a country’s digital assets, its digital penetration, its (public and private) investments in digital technology, its regulatory environment, its business innovation quotient, its digital educational and training ecosystem and the aggressiveness of corporate and government leadership. These indicators would provide an initial readiness score. Step two would require the integration of the readiness score with the FINTECH adoption score, which would more easily be calculated from a finite number of adoption indicators. (FINTECH adoption requires less measurement than digital readiness since there are fewer adoption versus readiness indicators.)

Methodologically, this is straightforward. Data calls to the most recent readiness and adoption data can be programmed into a dynamic calculator that present maturity scores to policymakers, companies, and NGOs, among other interested parties. It would support queries about a country’s readiness, its adoption behavior and its overall FINTECH maturity.

Such a system would be capable of answering simple and complex questions about how mature a country is, where its FINTECH weaknesses lie and what steps could be taken to improve its ability to play. Rules could be developed that would infer from maturity scores which FINTECH applications are within reach – or which educational, training and implementation steps are necessary to achieve specific applications goals, or combinations of applications, education and training.

FINTECH Guidance

A system that reports on the status of a country’s FINTECH would be of use to a variety of national and global actors. Country and regional teams at international organizations like the United Nations, the World Bank and the International Monetary Fund, among others, could query the system for information about the current and future FINTECH status of their countries.

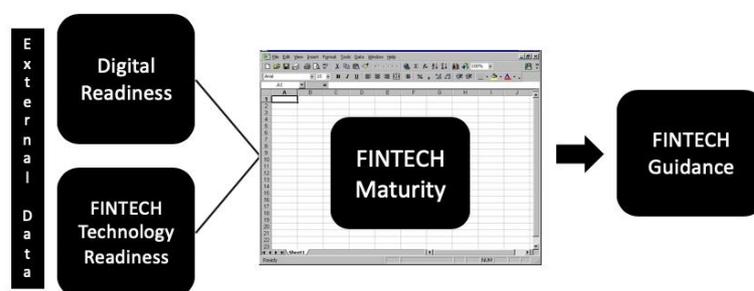


Figure 1: The FINTECH Guidance Process

Country teams could adopt an “if-then” approach to FINTECH applications driven by external data bases (about digital readiness and FINTECH maturity) and guidance about how to optimize FINTECH

opportunities and minimize FINTECH risks through a simple data base (“facts”) used to make inferences (“rules”) such as:

If country X has low digital readiness, low emerging technology adoption and low FINTECH maturity, then guidance should consist of FINTECH awareness, education, training and investment

If country Y has high digital readiness, high technology adoption and high FINTECH maturity, then guidance can include the application of cashless transactions, DLT/blockchain, smart contracts and Regtech, etc. to optimize the capability

More complex rules could assess and guide country teams, as Figure 2 below implies. The whole process can be represented as a managed flow from data to applications and training. External data can be collected, integrated and analyzed, fed into an inference engine that converts the analyses into guidance comprised of an applications map or a get-up-to-speed slate of awareness, education and training projects – as suggested in Figure 3.

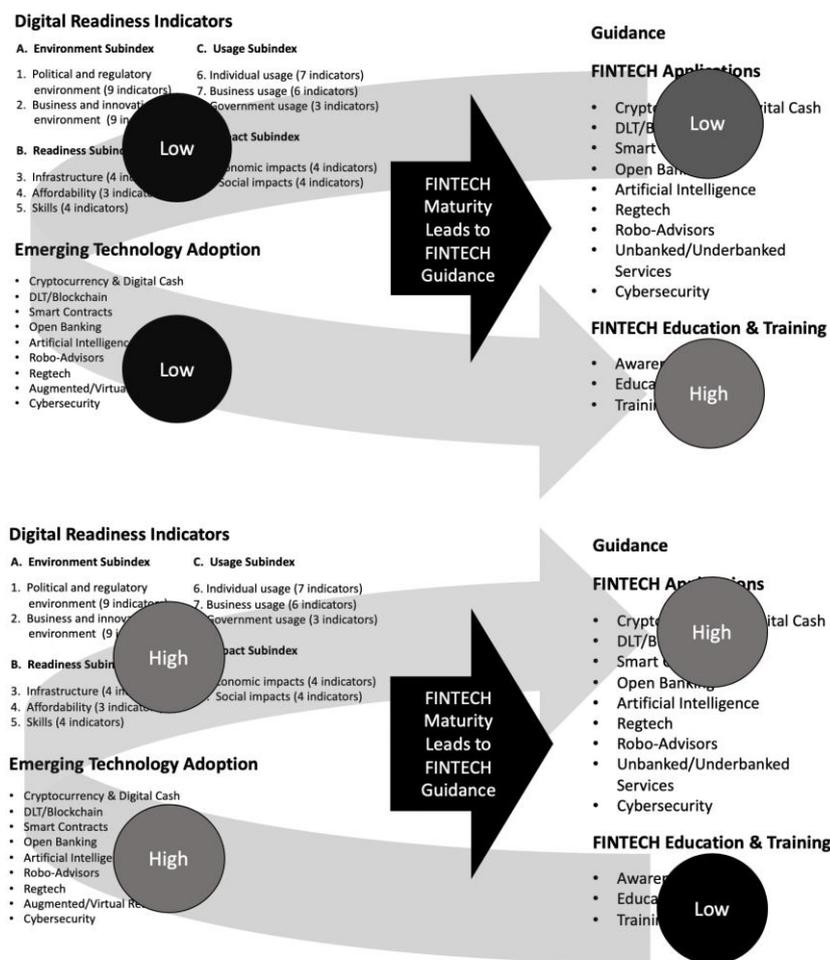


Figure 2: FINTECH Guidance

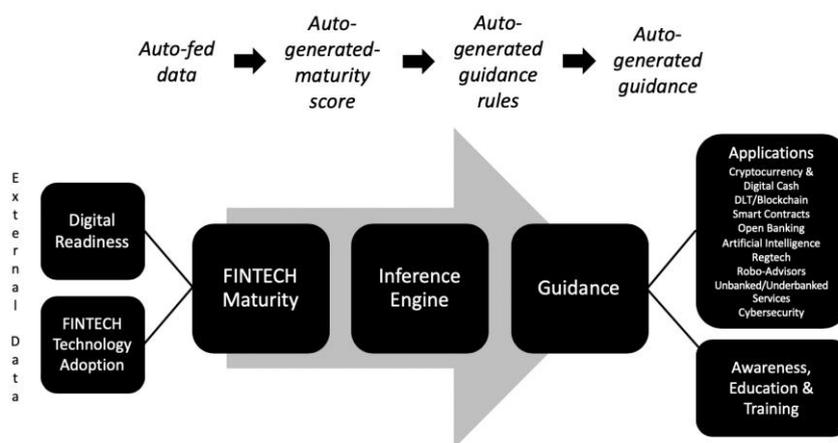


Figure 3: Detailed FINTECH Guidance Process

More specifically, the development of rules would require the identification of the digital readiness/FINTECH adoption capabilities necessary to, for example, deploy blockchain or smart contracts versus, for example, RegTech. Each FINTECH application area would be exploded in required capabilities which would enable the development of rules. Stated differently, the system would be capable of answering questions like: “*what would it take Country X to trans-act with distributed ledgers, like blockchain?*” “*What digital capabilities are required to offer open banking?*” “*Or smart contracts?*” The system would describe a digital infrastructure necessary to achieve the desired FINTECH applications capability, which would permit country teams to know what investments need to be made for their countries to participate in FINTECH-enabled transactions. The system could, in effect, perform FINTECH due diligence which would inform country teams about how bad – or good – FINTECH prospects are, and where investments need to be made to improve FINTECH maturity.

Remember, however, the concept here is not to completely automate the FINTECH assessment or guidance processes. Hard data, whenever available and validated, should drive country digital readiness and overall FINTECH maturity scores, but “soft” data extracted from country teams and other observers should be integrated into guidance decisions. For example, will central banks participate? Is the level of corruption high? Do vested financial interests lie with a small percentage of the population? Are there political obstacles to digital readiness, technology adoption and therefore FINTECH maturity? All inference systems rely on rules extracted from hard data and subject matter experts (in this case, country and regional teams who pro-pose ideal-versus-practical guidance).

A System for FINTECH Guidance

The objective is to develop a “system” that reports on the status of a country’s FINTECH capabilities that would be useful to country teams, which could query the system for information about the current and future FINTECH status of their countries. Such a system would be capable of answering simple and complex questions about how mature a country is, where its FIN-TECH weaknesses lie and what steps should be taken to improve its ability to participate in a FINTECH-ready global economy. Rules will populate the system that would infer from maturity scores which FINTECH applications are within reach – or which educational, training and investment steps are necessary to achieve specific FINTECH applications goals.

Third-party and primary readiness and adoption data will be normalized following a qualitative/quantitative rationalization of the indicators used to score digital readiness (from approved collection organizations and data bases, like the WEF). Data calls to the most recent readiness and adoption data will be programmed into a dynamic calculator that presents maturity scores to country teams. It will support queries about a country’s readiness, its adoption behavior and its overall FINTECH maturity. The development of rules regarding the identification of digital readiness/ FINTECH adoption capabilities necessary to, for example, deploy blockchain or smart contracts versus, for example, RegTech.

Each FINTECH application area will be exploded in required capabilities to inform teams about what's possible, what's impossible and what steps should be taken to leverage each FINTECH application.

The system will be capable of answering questions like: “*what would it take country X to trans-act with distributed ledgers, like blockchain?*” “*What digital capabilities are required to offer open banking?*” “*Or smart contracts?*” The system will describe the digital infrastructure necessary to achieve the desired FINTECH applications capability, which will permit country teams to know what investments need to be made for their countries to participate in FINTECH-enabled transactions. The system will perform FINTECH due diligence which will inform corporate, government and NGO country teams about how bad – or good – FINTECH prospects are, and what specific investments need to be made to improve FINTECH maturity.

Conclusions

It's very possible to surveil digital readiness and calculate FINTECH maturity across countries (and regions) with 3rd-party and primary data.

Countries can be scored according to their digital readiness and technology adoption which enables FINTECH maturity scoring.

Corporate, government and NGO country teams can benefit from digital readiness and FINTECH maturity rankings to inform companies and countries about how to leverage FINTECH.

Based on FINTECH maturity scores, country teams can offer guidance about applications, education, training and investment.

“If-then” approaches to country guidance with “rules” about FINTECH maturity and practical guidance can be developed.

The first step is the development of (automated) surveillance tools to measure digital readiness, technology adoption and FINTECH maturity. Step two is the development of maturity scores; step three is the development of rules to assist country teams generate practical FINTECH guidance.

Country teams can be part of NGOs, governments, companies or banks looking to improve the transaction capabilities of countries in which they have financial vested interests.

While FINTECH is generally perceived as a corporate capability, the model described here is targeted at countries and regions. Inclusiveness is the goal. Countries with little or no FINTECH maturity will be financially disenfranchised, while those with high maturity scores will dominate the global economy – together – which is the essence of the inclusivity objective. But will some countries leapfrog necessary digital readiness and go directly to the cloud (and other providers) to become FINTECH ready? Will cryptocurrency and blockchain level the playing field? Will central banks become less relevant – or FINTECH governors? Many such questions will be answered over time, but in the meantime, it makes sense for countries to invest in their digital infrastructures and adopt FINTECH as quickly as they can – so they can play in the FINTECH world.

Acknowledgement

(The International Monetary Fund supported parts of this work.)

References

Bhaskar Chakravorti and Ravi Shankar Chaturvedi, **Digital Planet 2017: How Competitiveness and Trust in Digital Economies Vary Across the World**, The Fletcher School, Tufts University July 2017 (<https://sites.tufts.edu/digitalplanet/dei17/>)

Imran Gulamhuseinwala, Matt Hatch and James Lloyd, **EY FinTech Adoption Index 2017: The Rapid Emergence of FinTech**, EY, 2017 ([https://www.ey.com/Publication/vwLUAssets/ey-fintech-adoption-index-2017/\\$FILE/ey-fintech-adoption-index-2017.pdf](https://www.ey.com/Publication/vwLUAssets/ey-fintech-adoption-index-2017/$FILE/ey-fintech-adoption-index-2017.pdf))

Julia Kagan, **Fintech**, Investopedia, May 17, 2019 (<https://www.investopedia.com/terms/f/fintech.asp>)

Tae Yoo, Mary de Wysocki, and Amanda Cumberland, **Country Digital Readiness: Research to Determine a Country's Digital Readiness and Key Interventions**, Cisco Corporate Affairs, May 2018 (<https://www.cisco.com/c/dam/assets/csr/pdf/Country-Digital-Readiness-White-Paper-US.pdf>)

World Economic Forum, **The Global Information Technology Report 2016**, July 6, 2016. (<https://www.weforum.org/reports/the-global-information-technology-report-2016>)