FINTECH AND DIGITAL FINANCIAL SERVICES ECOSYSTEM DATA FOR SUPERVISION AND MARKET INTELLIGENCE

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EXECUTIVE SUMMARY

The financial technology (FinTech) and digital financial services (DFS) sectors are rapidly transforming finance, using innovative technologies and models to change service design, development, and delivery. This continuous evolution generates new insights into customer and market trends, including access, usage, and service quality.

Understanding the typology of new non-bank entrants and the constant digitalization of incumbents involved in DFS, coupled with the diversity of financial activities made possible by emerging technologies and changing user perspectives, is crucial for regulators.

Developing approaches to identify relevant data sources is essential to build a reliable and robust financial ecosystem. Data, therefore, plays a pivotal role, serving as the foundation for research and statistics within central banks and among policymakers. It directly

supports the identification of risks, influences the design of effective policies and decision-making in areas such as financial inclusion, payment systems, financial stability, regulations, supervision and oversight, consumer protection, monetary policy, and market conduct, ultimately empowering financial regulators to take timely and well-targeted actions.

With the rise of FinTechs and innovative financial service providers (FSPs), robust data collection and analysis informs regulators about market trends, cybersecurity threats, ecosystem intelligence, public perception, evolving customer behavior, and much more, allowing a shift from reactive to proactive policymaking.

It is imperative for regulators to strike a balance between financial stability, market integrity, competition, financial inclusion, consumer protection, and data privacy as they navigate this evolving landscape,[1] recognizing access to, use of, and reliance on high quality, timely, and relevant data as transformative.

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[1] World Bank Group. 2022. Regulation and Supervision of Fintech: Considerations for EMDE Policymakers. Available at: https://documents1.worldbank.org/curated/en/099735204212215248/pdf/P173006033b45702d09522066cbc8338dc_b.pdf

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FIGURE 1. BASELINE FINTECH TAXONOMY

FINTECH AND DFS ENTITIES

- Traditional Financial Institutions
- Fintech Startups
- BigTech Companies
- Payment Service Providers
- Peer-to-Peer Lenders
- Digital Wallet Providers
- InsurTech Firms

FINTECH AND DFS ACTIVITIES

- Digital Payments
- Digital Banking
- Digital Lending
- Digital Capital Raising
- Digital Savings
- Asset Management
- InsurTech Services
- Central Bank Digital Currencies
- Cryptocurrency

TECHNOLOGY ENABLERS FOR DFS

- Cloud
- API
- Biometric
- Distributed Ledger Technology (DLT)
- Artificial Intelligence (AI) and Machine Learning (ML)
- Digital ID

POLICY ENABLERS FOR DFS

- E-KYC
- Open Banking
- Data Protection
- Cybersecurity
- Payment Systems
- Electronic Money

This Guideline Note establishes that understanding the DFS and FinTech ecosystem typology is essential. It introduces a baseline FinTech taxonomy as a representation of the ecosystem within the AFI network, outlines the demand for data by policymakers, details the data breakdown, and introduces the SPACE framework (see **Figure 2**).

The SPACE framework provides recommendations and policy guidance for developing and implementing a policy roadmap to leverage DFS and FinTech ecosystem data for supervision and market intelligence at both the institutional and ecosystem levels.
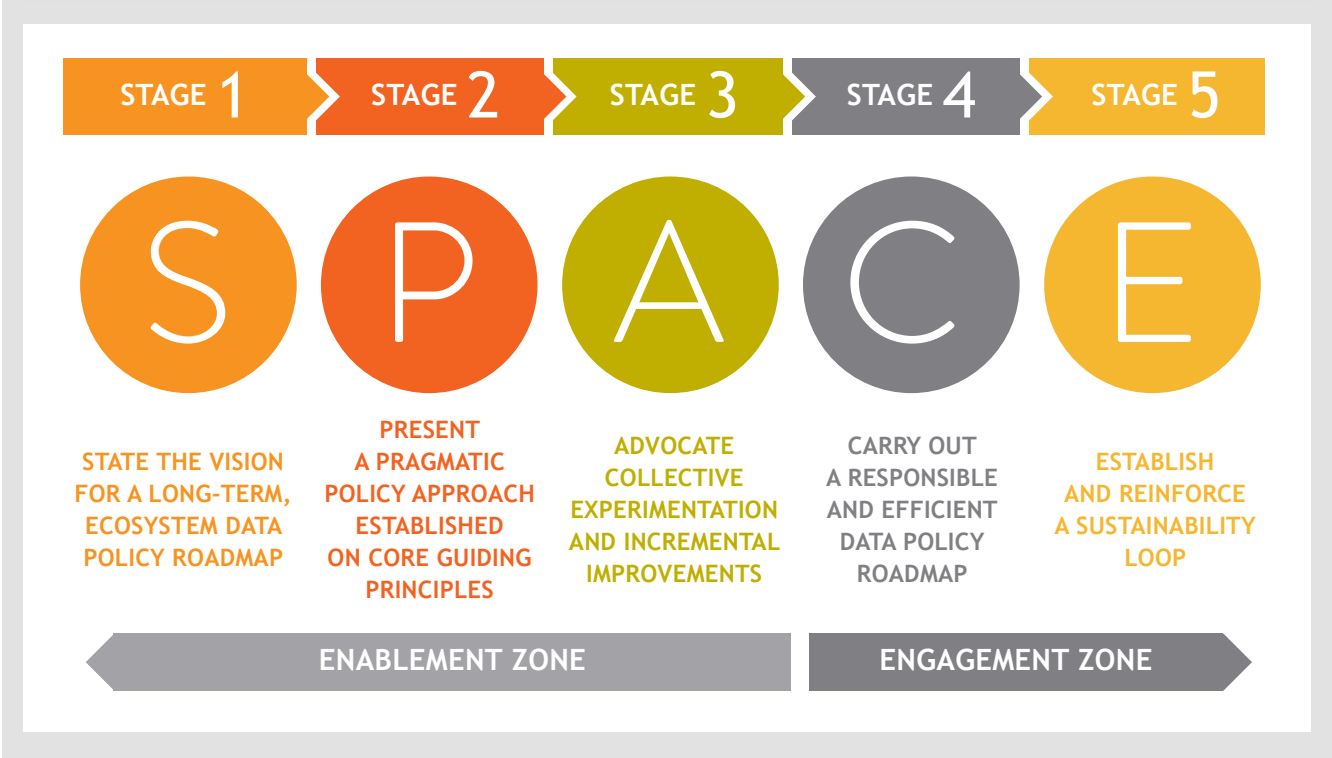
The SPACE framework, along with its technical and policy guidance in this Guideline Note, draws inspiration from the ADKAR change management model.[2]

While distinct, the SPACE framework adopts ADKAR's structured transition approach to guide the central bank's program on using DFS and FinTech ecosystem data for supervision and market intelligence.

The Guiding Principles (GPs) within the framework serve as safeguards to ensure responsible and legal data handling, from access to action, fostering transparency and collaboration, maintaining risk mitigation, and utilizing innovative technologies to enhance financial inclusion.

This Guideline Note provides central banks and policymakers with guidance on adopting ecosystem-based data collection approaches to develop policies, transition roadmaps, and data strategies leveraging the SPACE framework, with the anticipated outcome of enhancing FinTech supervision, decision-making, and deepening financial inclusion.

FIGURE 2. THE SPACE FRAMEWORK ON DFS AND FINTECH ECOSYSTEM DATA FOR MARKET INTELLIGENCE AND SUPERVISION[3]

| STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 |

S STATE THE VISION FOR A LONG-TERM, ECOSYSTEM DATA POLICY ROADMAP

P PRESENT A PRAGMATIC POLICY APPROACH ESTABLISHED ON CORE GUIDING PRINCIPLES

A ADVOCATE COLLECTIVE EXPERIMENTATION AND INCREMENTAL IMPROVEMENTS

C CARRY OUT A RESPONSIBLE AND EFFICIENT DATA POLICY ROADMAP

E ESTABLISH AND REINFORCE A SUSTAINABILITY LOOP

ENABLEMENT ZONE — ENGAGEMENT ZONE

[2] The ADKAR model, developed by Prosci, is widely recognized in change management. It provides a structured approach to managing the people side of change, acknowledging that successful transformation requires individuals to transition through specific stages. Learn more at: https://www.prosci.com/methodology/adkar

[3] Authors adaptation of the ADKAR model.

SECTION I: INTRODUCTION, SCOPE, AND OBJECTIVES

This document addresses the need for comprehensive data strategies in emerging and developing market economies, particularly in the context of the rapidly evolving FinTech and DFS ecosystem. It aims to guide regulators and central banks in adopting ecosystem-based data collection approaches, offering practical insights and a standardized taxonomy for enhanced decision-making, supervision, and the pursuit of financial inclusion goals.

In response to transformative shifts in the financial sector, AFI member countries, represented by the Digital Financial Services Working Group (DFSWG), recognize that rapid digitalization requires an approach to data across the entire ecosystem, grounded in principles such as intelligence, usefulness, and representativeness. This is essential to ensure the formulation of proportionate and timely policies, and to facilitate data-driven decision- making.

Within this context, the primary objective of this document is to offer clear and actionable guidance to members of the AFI network and beyond on the approaches to collecting data from the FinTech and DFS ecosystem, within responsible limits and parameters governing the velocity, volume, and veracity of data.

This is vital for developing a comprehensive, sustainable strategy that includes data collection, analysis, stakeholder collaboration, and decision-making across the FinTech, DFS, and financial services ecosystems, with an aim to expand financial inclusion.

The document also sets out to establish a standardized taxonomy for FinTech and DFS providers, helping to distinguish these entities by their business models, activities, and offerings. To draft this document, a questionnaire was sent to member countries, and interviews were conducted with selected central banks. This approach helped gather insights on data handling practices in FinTech and DFS supervision and market intelligence within AFI members and to understand the implementation of data governance in these FinTech ecosystems.

The objective of the Guideline Note is to provide a comprehensive and practical policy guide for regulators and central banks to adopt ecosystem-based data collection approaches, develop data strategies, and transition roadmaps for enhanced decision-making, supervision, and the pursuit of financial inclusion goals.

SECTION II: UNDERSTANDING THE DFS AND FINTECH ECOSYSTEM AND DATA DEMANDS FOR SUPERVISORY AND POLICY OBJECTIVES

This section lays the groundwork for two key elements in the Guideline Note: (i) It establishes a baseline taxonomy for the DFS and FinTech Ecosystem to provide readers with a reference for the document's guidance; and (ii) It examines the crucial reasons regulators require more, higher-quality, and timely data, for different purposes and use cases, including regulation, supervision, and decision- making.

2.1 DFS AND FINTECH ECOSYSTEM TAXONOMY – THE COMMON BASELINE

This subsection introduces a standardized classification for FinTech and DFS providers within the AFI network, detailing their services and products to create a baseline for the ecosystem that facilitates the identification of data sources, types, complexities, and the challenges and opportunities for data collection.

No single definition of "FinTech" is universally recognized, but common references include AFI's definition[4] highlighting the use of technology and innovative business models in financial services, and the Financial Stability Board's definition focusing on technologically enabled financial innovation.[5]

Consequently, countries define their FinTech ecosystems based on policy goals and the state and activities of their financial system.

The Cambridge FinTech Ecosystem Atlas proposes a comprehensive taxonomy based on global data, identifying "digital lending" and "digital payments" as key market segments within the FinTech landscape of AFI members (See **Figure A2, A3, and A4 under Annexure 1**). Notably, the top 10 AFI countries by the number and presence of FinTech entities account for over 80 percent of the community.

Comparative analysis with regulator and supervisor data in the AFI network, as detailed in the AFI DFS State of Practice Report,[6] shows continuous efforts to enact DFS-enabling regulations, for example, over 40 percent of AFI members have policy or regulatory guidance supporting digital lending.

National financial inclusion strategies: current state of practice (2022)
> View [here](#)

In summary, we identified five pillars of a representative DFS regulatory ecosystem, illustrated in **Figure 3**.

From responses by 25 percent of AFI member countries, the findings summarized in **Figure A1** (See Annexure 1) reflect the role of regulatory authorities in data collection and intelligence, based on the comparison of AFI and CCAF FinTech taxonomy data elements, which highlights that the majority of AFI members' FinTech entities focus on digital lending (25 percent) and digital payments (20 percent).

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4 Alliance for Financial Inclusion. 2022. Words Matter: AFI's Financial Inclusion Dictionary. Available at: [https://www.afi-global.org/wp-content/uploads/2022/11/Words-Matter-AFIs-Financial-Inclusion- Dictionary_2023_isbn.pdf](https://www.afi-global.org/wp-content/uploads/2022/11/Words-Matter-AFIs-Financial-Inclusion-Dictionary_2023_isbn.pdf)

5 Financial Stability Board. 2017. Financial Stability Implications from FinTech. Available at: https://www.fsb.org/wp-content/uploads/R270617.pdf

6 Alliance for Financial Inclusion. 2022. Current State of Practice on the Formulation of Digital Financial Services Regulations. Available at: [https://www.afi-global.org/publications/national-financial-inclusion-strategies-current- state-of-practice-2022/](https://www.afi-global.org/publications/national-financial-inclusion-strategies-current-state-of-practice-2022/)

FIGURE 3. AFI DFS STATE OF PRACTICE: FIVE PILLARS FOR A DFS REGULATORY ECOSYSTEM

INCLUSIVE INNOVATION

Ecosystem Level
- Financial inclusion - NFIS/DFS/Fintech Strategy
- Industry association/Self-regulatory

Institutional Level
- Other industry mechanisms
- Regulatory cooperation

Regulatory Principles
(interoperability, gender-oriented DFS policies)

DIGITAL PAYMENTS

Payments Systems (97%)
- Fast payment systems (76%)

E-money (96%)

Branchless Banking, Agent Banking codes (63%)

QR Codes (49%)

PROTECTION AND PRIVACY

Consumer Protection for DFS (83%)
- Financial inclusion - NFIS/DFS/Fintech Strategy
- Industry association/Self-regulatory

Institutional Level
- Other industry mechanisms
- Regulatory cooperation

Regulatory Principles
(interoperability, gender-oriented DFS policies)

DIGITAL FINANCE AND INNOVATIONS

Digital Products:
- Digital lending (40%)
- Digital credit (37%)
- Insurance (32%)
- NBFI cross-border financial transfers (60%)

Open Finance (36%)

Digital Banking (28%)

Central Bank Digital Currencies CBDC (80%)

Cryptocurrencies (23%)

INCLUSIVE FINANCIAL INTEGRITY

Digital Identity codes (46%)
- eKYC codes (55%)

Tiered KYC including

eKYC

AML/CFT

Our research acknowledges varying FinTech taxonomies across jurisdictions. Thus, we propose a baseline classification, influenced by AFI's DFS State of Practice Report, CCAF's taxonomy, and AFI network surveys, to represent a typical FinTech and DFS ecosystem.

This classification is intended as a guiding reference and we acknowledge that it is not exhaustive.[7]

TABLE 1. PROPOSED BASELINE FINTECH TAXONOMY

AFI'S DEFINITION OF FINTECH:[7] THE USE OF TECHNOLOGY AND INNOVATIVE BUSINESS MODELS IN THE PROVISION OF FINANCIAL SERVICES. THE TERM IS A CONTRACTION OF "FINANCIAL TECHNOLOGY". IT REFERS MAINLY TO TECHNOLOGICAL INNOVATIONS IN THE FINANCIAL SECTOR, INCLUDING INNOVATIONS IN FINANCIAL LITERACY AND EDUCATION, RETAIL BANKING, INVESTMENT, AND EVEN CRYPTOCURRENCIES.

FINTECH AND DFS ENTITIES	FINTECH AND DFS ACTIVITIES
✓ **TRADITIONAL FINANCIAL INSTITUTIONS:** Banks, credit unions, insurance companies, non-banking financial institutions, and investment firms.	✓ **DIGITAL PAYMENTS:** Payment systems, online, mobile, and contactless payment solutions, including e-money, digital wallets, and QR code payments.
✓ **FINTECH START-UPS:** Newly established (specifically early maturity) technology-driven companies offering a variety of innovative financial solutions.	✓ **DIGITAL BANKING:** Fully digital banking and agent banking.
✓ **BIGTECH COMPANIES:** Large technology corporations entering the financial sector with services.	✓ **DIGITAL LENDING:** Balance sheet lending, peer-to-peer lending, loan crowdfunding, and microfinance platforms.
✓ **PAYMENT SERVICE PROVIDERS:** Entities facilitating payment transactions, including mobile money operators, e-wallet providers, and payment gateways.	✓ **DIGITAL CAPITAL RAISING:** Investment/non-investment based/equity crowdfunding.
✓ **PEER-TO-PEER LENDERS:** Platforms connecting borrowers and lenders directly, including crowdfunding, eliminating the need for intermediaries.	✓ **DIGITAL SAVINGS:** Digital money market/Funds, Digital/Micro/Collective Savings.
✓ **DIGITAL WALLET PROVIDERS:** Offer digital wallets to store funds, make payments, and conduct transactions.	✓ **ASSET MANAGEMENT:** Wealth tech, robo-advisory, automated investment advice, portfolio management services.
✓ **INSURTECH FIRMS:** Companies leveraging technology for insurance services, such as online claims processing and policy management.	✓ **INSURTECH SERVICES:** Tech-driven insurance services like usage-based policies and instant claims processing.
	✓ **CENTRAL BANK DIGITAL CURRENCIES (CBDC) TECHNOLOGY PROVIDER, ISSUANCE AND MANAGEMENT**
	✓ **CRYPTOCURRENCY EXCHANGE AND TRADING:** Financial activities related to stable coins, crypto assets, and digital assets.

TECHNOLOGY ENABLERS FOR DFS	POLICY ENABLERS FOR DFS
✓ **CLOUD:** Utilization of cloud computing infrastructure.	✓ **DIGITAL ID:** Adoption and use of digital identification systems.
✓ **APIS:** Application Programming Interfaces facilitating data exchange and integration.	✓ **OPEN BANKING:** Implementation of open banking frameworks.
✓ **BIOMETRIC:** Application of biometric authentication methods.	✓ **DATA PROTECTION:** Measures ensuring data privacy and security.
✓ **DISTRIBUTED LEDGER TECHNOLOGY (DLT):** Implementation of blockchain and similar DLT.	✓ **CYBERSECURITY:** Safeguards against cyber threats and vulnerabilities.
✓ **ARTIFICIAL INTELLIGENCE (AI) AND MACHINE LEARNING (ML):** Deployment of AI and ML for data analysis and decision-making, RegTech, SupTech, etc.	✓ **INNOVATION FACILITATORS:** Initiatives promoting innovation within the FinTech ecosystem.

Alliance for Financial Inclusion. 2022. Words Matter: AFI's Financial Inclusion Dictionary. Available at: https://www.afi-global.org/wp-content/uploads/2022/11/Words-Matter-AFIs-Financial-Inclusion- Dictionary_2023_isbn.pdf

2.2 DEMANDS FOR DATA AMONG FINANCIAL POLICYMAKERS

Regulators require specific industry data to tailor policies for FinTechs and non-bank entities based on activity types, risk profiles, and entity sizes. This data is pivotal for R&D in regulatory actions or for arguing against regulation for certain activities, helping regulators balance stability, competition, efficiency, and financial inclusion.

Financial policymakers and regulators have an elevated demand for data due to several critical reasons:

✓ **MARKET UNDERSTANDING:** The FinTech industry is characterized by rapid technological advancements, diverse business models, and complex financial products and services. Regulators need comprehensive data to effectively understand and address these complexities.

✓ **IMPROVE PUBLIC POLICY FORMULATION:** Data serves as the bedrock for well-informed decision-making and empowers regulators to comprehend market dynamics and formulate effective policies. The volume of data enables a comprehensive overview of the financial ecosystem, while the variety of data types allows for an analysis of the complex financial landscape.

✓ **RISK ASSESSMENTS:** Data is paramount for risk assessments. The financial sector is exposed to a multitude of risks, and to effectively evaluate and mitigate these risks and safeguard the integrity and stability of the financial system, regulators rely on robust data collection and analysis, utilizing a diverse array of data sources.

Authorities collect data through various methods, driven by objectives like financial stability, integrity, risk monitoring and mitigation, consumer protection, and financial inclusion. Data collection varies by jurisdiction but typically includes activity-based, entity-based, consumer and market risk, technology-choice, and policy impact data.

✓ **ACTIVITY-BASED DATA** highlights the need for information in areas such as payment systems, DFS and FinTech ecosystems and other relevant indicators of FinTech activities on financial stability. While all AFI survey respondents recognize the need to include such data collection in regulations and policies, many note a lack of clear guidance, interest, or initiative in collecting FinTech and DFS related data in their strategic policy documents, for example, NFIS.

As highlighted in the Irving Fisher Committee survey,[8] there is a heightened need for data in areas where FinTech activities intersect with payment systems, followed by financial stability, banking supervision, research and statistics, and monetary policy.

Most AFI respondents[9] confirm that they gather data and monitor FinTech activity within their jurisdiction for different policy objectives, but the demand for data is higher in relation to financial inclusion policy (90 percent), followed by financial stability, consumer protection, and efficiency of payment systems (75 percent). There are clear opportunities for higher quality data on the impact of activities on women, older people, and other vulnerable groups.

✓ **ENTITY-BASED DATA:** Particularly from payment and lending services, outlines priority areas for data collection.

The AFI survey (see **Figure 4**) reveals emerging data needs related to the entry of BigTechs into financial services, underlining the need for proportionate regulations against potential new risks or other risks exacerbated by BigTechs.[10]

The most substantial demand for data by regulators concerning FinTech entities is on providers engaged in payments, e-money, clearing, and settlement services, as shown by the Irving Fischer Committee survey, followed closely by credit platforms, peer-to- peer lending platforms, neobanks, asset management firms, and insurance companies.

Most AFI respondents confirm the presence of BigTechs operating in the financial sector within their countries, such as Meta, Amazon, Alibaba, Apple, Google, Microsoft, Uber, eBay, etc. And the fact that these BigTechs leverage their vast customer base, digital infrastructure, and data analytics capabilities to offer financial products and services presents a compelling case for considering them as a relevant data source.

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8 Bank for International Settlements. 2020. Irving Fisher Committee (IFC) Report No. 10 - Central banks and fintech data issues. Available at: https://www.bis.org/ifc/publ/ifc_report_fintech_2002.pdf

9 See Annexure 1.

10 World Bank Group. 2022. Global Market Survey, Digital Technology and the Future of Finance Fintech. Available at: https://documents1.worldbank.org/curated/en/099735404212273637/pdf/P1730060bfa4c60010b833091f0f2fe2fc8.pdf

FIGURE 4. FINANCIAL SERVICES PROVIDED BY BIGTECHS: AFI NETWORK

Which of the following financial services provided by bigtechs/digital platforms, in your country, do you think leverages on vast amounts of data? Please select all that apply in your country:
(20 responses)

PAYMENTS	**16** (80%)
E-MONEY	**15** (75%)
LENDING	**10** (50%)
INSURANCE	**9** (45%)
INVESTMENT MANAGEMENT	**4** (20%)
OPEN BANKING	**2** (10%)
WE DON'T HAVE THIS INFORMATION	**2** (10%)
NONE	**1** (5%)
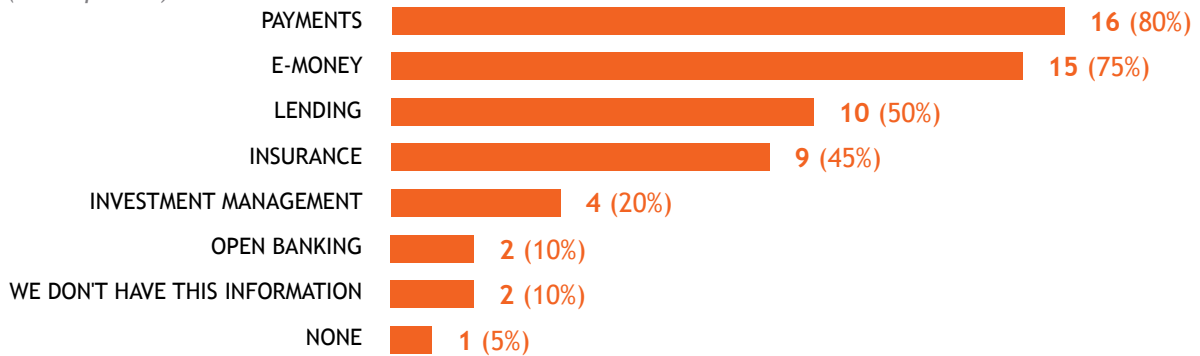
Consequently, there is a growing need for data driven and tailored policy responses to mitigate the overall spectrum of risks presented by non-bank and FinTech entities, such as but not limited to cybersecurity, data protection, and reliance on third parties,[11] but more importantly, systemic risk, non-compliance with AML/CFT requirements risk, and data privacy risk.

✓ **CONSUMER AND MARKET RISK:** Understanding the dynamics within the DFS and FinTech ecosystem, which includes information on the actions, decisions, and trends exhibited by consumers and market participants, helps to assess the impacts of DFS and FinTech on financial inclusion and stability.

Regulators are increasingly using proxies as tools to access data related to FinTech and BigTech entities, which are collected by other authorities. This data can be valuable for supervisors and vice-versa, helping to avoid duplication of data collection efforts. Implementing validation and verification mechanisms is necessary to ensure the completeness and accuracy of information obtained from third-party data sources.[12]

According to the responses gathered from the AFI survey (see **Figure 5**, most respondents claim to not have a FinT ech data mapping document at the institutional or national level.

Only 30 percent confirm having already established a data mapping document in collaboration with other national regulatory authorities.

FIGURE 5. FINTECH TAXONOMY: AFI NETWORK

Does your institution possess a comprehensive dictionary, or a taxonomy for Fintech ecosystem and DFS activities? Please select one:
(19 responses)
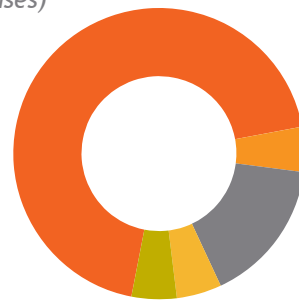
NO, we don't have a document covering all fintech and DFS glossary

I DON'T KNOW

YES, it is a document accepted at national level and publicly available

YES, it is a document accepted at institutional level and publicly available

YES, it is a document adapted for our local needs, based in global / regional documents

[11] World Bank. 2022. Regulation and Supervision of Fintech: Considerations for EMDE Policymakers. Available at: https://documents1.worldbank.org/curated/en/099735204212215248/pdf/P173006033b45702d09522066cbc8338dc_b.pdf

[12] CGAP. 2017. Working Paper – Data Collection by Supervisors of DFS. Available at: https://www.cgap.org/sites/default/files/Working-Paper-Data-Collection-by-Supervisors-of-DFS-Dec-2017.pdf

✔ **TECHNOLOGY-CHOICE RELATED DATA:** Technology-choice related data refers to information regarding the choice of technology solutions adopted by FSPs and FinTech companies.

This data includes the selection of infrastructure, software, hardware, other technology components, or subscriptions to Software-as-a-service (SaaS) models, cloud services, and any other engagement of unique, emerging, or innovative technology tools, processes or solutions that underpin DFS offerings.

Regulators require technology-choice related data to understand the technical foundations of DFS and FinTech services. This information can present insights in assessing the resilience, security, and scalability of technology solutions, or overall exposure of their markets to certain technology solutions which are critical for ensuring the stability and safety of the financial system.
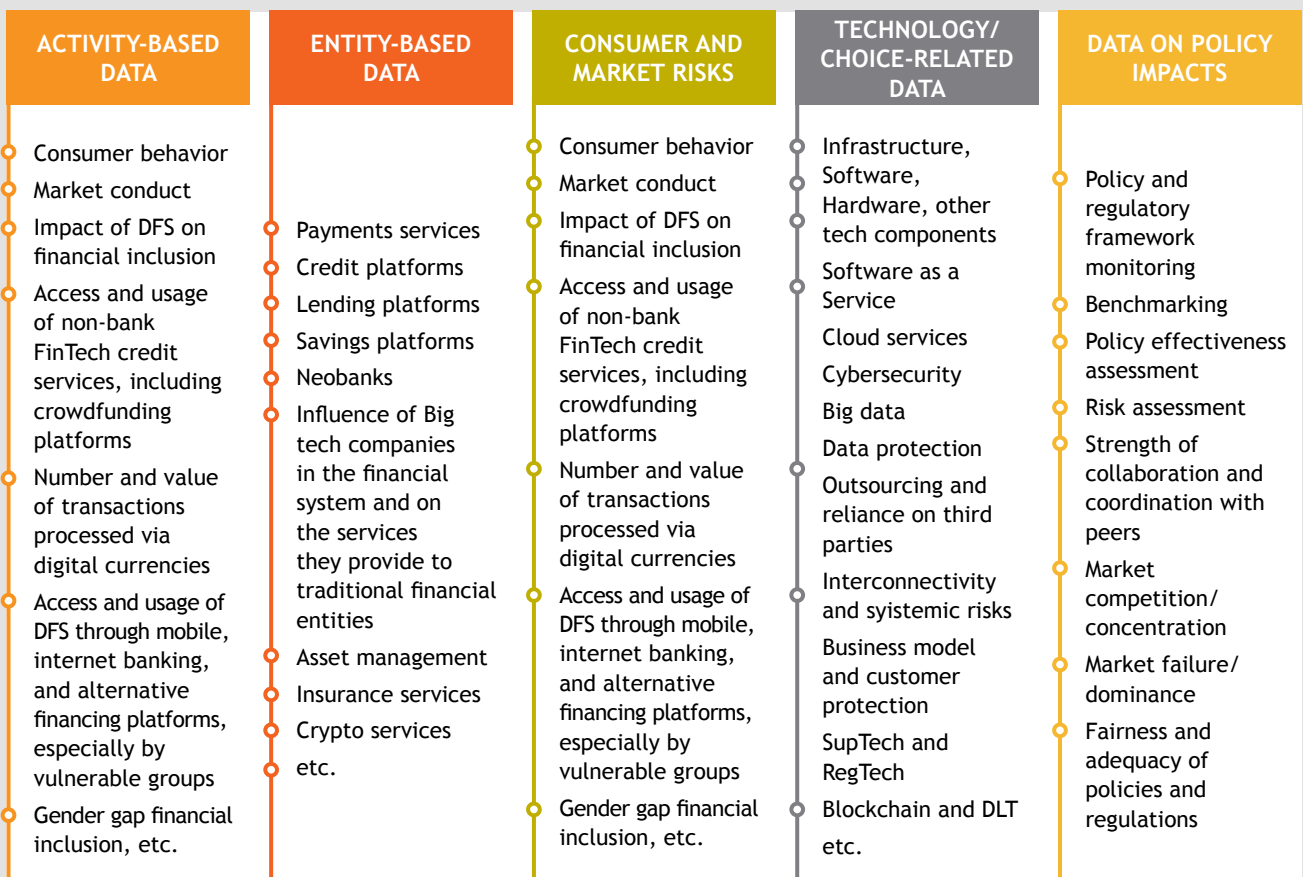
✔ **DATA ON REGULATORY POLICY IMPACT:** Assessing the net impact of regulatory policies over time on a FinTech ecosystem is essential to identify and collect specific data indicators that reflect the breadth and depth of the influence of these policies, covering multiple indicators which include adoption and usage rates, access, competition, compliance, ecosystem risk threshold, consumer protection and the overall health of the FinTech and DFS ecosystem.

Systematically collecting and analyzing targeted data indicators is vital to understand the net impact of regulatory policies on the DFS and FinTech ecosystem.

Such efforts enable stakeholders and regulators to make informed decisions, adapt to changing market needs, and ultimately enhance the efficacy, fairness, and inclusiveness of the financial services landscape.

By comparing practices, methodologies, and outcomes against industry standards and peer institutions, regulatory authorities can identify areas for improvement, track progress, and ensure that their strategies remain aligned with evolving industry trends.

FIGURE 6. DEMAND FOR DATA ON THE DFS AND FINTECH ECOSYSTEM – DATA TYPES

ACTIVITY-BASED DATA	ENTITY-BASED DATA	CONSUMER AND MARKET RISKS	TECHNOLOGY/ CHOICE-RELATED DATA	DATA ON POLICY IMPACTS
Consumer behavior		Consumer behavior	Infrastructure, Software, Hardware, other tech components	Policy and regulatory framework monitoring
Market conduct	Payments services	Market conduct	Software as a Service	Benchmarking
Impact of DFS on financial inclusion	Credit platforms	Impact of DFS on financial inclusion	Cloud services	Policy effectiveness assessment
Access and usage of non-bank FinTech credit services, including crowdfunding platforms	Lending platforms	Access and usage of non-bank FinTech credit services, including crowdfunding platforms	Cybersecurity	Risk assessment
	Savings platforms		Big data	Strength of collaboration and coordination with peers
	Neobanks		Data protection	
Number and value of transactions processed via digital currencies	Influence of Big tech companies in the financial system and on the services they provide to traditional financial entities	Number and value of transactions processed via digital currencies	Outsourcing and reliance on third parties	Market competition/ concentration
			Interconnectivity and sysitemic risks	Market failure/ dominance
Access and usage of DFS through mobile, internet banking, and alternative financing platforms, especially by vulnerable groups	Asset management	Access and usage of DFS through mobile, internet banking, and alternative financing platforms, especially by vulnerable groups	Business model and customer protection	Fairness and adequacy of policies and regulations
	Insurance services		SupTech and RegTech	
	Crypto services etc.		Blockchain and DLT etc.	
Gender gap financial inclusion, etc.		Gender gap financial inclusion, etc.		

2.3 BARRIERS TO ECOSYSTEM-LEVEL DATA COLLECTION AMONG FINANCIAL POLICYMAKERS

The collection of FinTech ecosystem data by financial policymakers faces multifaceted barriers, ranging from the escalating costs and resource demands on service providers to evolving mandates for specific data types. These challenges are compounded by technological limitations, varying capacities and capabilities, compliance burdens, and intricate data collection workflows.

The dynamic nature of policy demands and the evolving FinTech landscape necessitate continuous adaptation in data collection methodologies, complicating the process for all stakeholders involved.

Furthermore, the intricate data collection workflows and the necessity to balance data comprehensiveness with privacy and security considerations exacerbate these challenges, posing critical hurdles to effective policymaking and ecosystem analysis.

Furthermore, the lack of interoperability and standardization across different data systems and protocols complicates data aggregation and utilization. Ensuring data privacy and security while collecting and processing vast amounts of information presents a persistent challenge, impacting stakeholder trust, the competitive landscape, and market dynamics, which influence the willingness and ability of entities to share data, and may negatively affect ecosystem-wide data collection efforts.

Figure 7 below frames some of the compelling issues identified by regulators and industry actors towards a comprehensive yet agile data collection process. It is important to note that although the identified barriers are likely interconnected, they do need not to be read sequentially.

In conclusion, addressing these barriers requires collaboration between industry, regulators, and other stakeholders to establish common standards, improve security measures, and build trust within the broader ecosystem.

FIGURE 7. BARRIERS TO ECOSYSTEM-WISE DATA COLLECTION AND USE BY REGULATORS

Source: Authors analysis from literature research and survey

SPIRALLING COSTS AND RESOURCE INTENSITY

To deliver on data collection and analytics demands, the costs and resources needed by both regulators and industry could be potentially staggering.

TECHNOLOGY CONSTRAINTS

Legacy systems, siloed infrastructure, lack of common technology stacks and standards presents limitations that can hinder the efficient aggregation and analysis of relevant data.

CAPABILITY AND CAPACITY GAPS

Navigating the complexity and variabilities in the capacity and capability of institutions to collect, process, and analyze data can lead to inconsistent data quality and availability

EVOLVING DATA MANDATE

The changing demands of policymakers for specific types of data can pose significant challenges, requiring frequent adjustments to data collection strategies (e.g. identifying use cases) and systems (e.g. validating sources of truth).

DATA DELIVERY AND PROCESS FLOWS

Lack of defined industry-wise common standards, coupled with inefficient reporting infrastructure and integrated systems poses challenges to data delivery flows.

BURDEN OF COMPLIANCE

The obligation to adhere to stringent regulatory data collection requirements or ensure the right interpretation can place a significant burden on industry participants, affecting their operational efficiency.
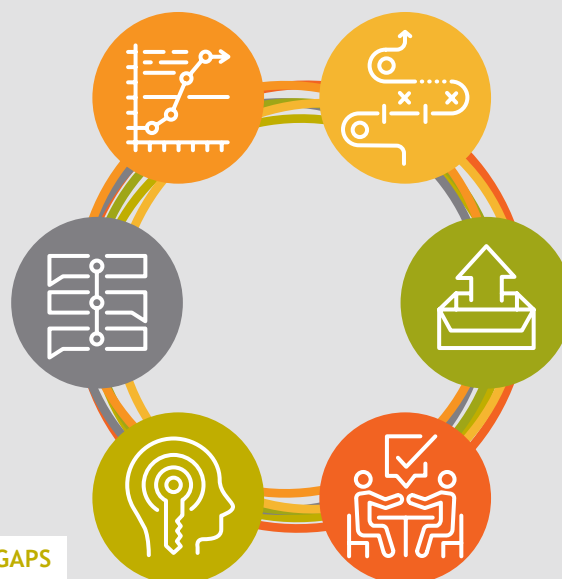
2.4 UNBUNDLING DFS AND FINTECH ECOSYSTEM DATA FOR SUPERVISION AND MARKET INTELLIGENCE

To enhance supervision and market intelligence, regulators must navigate issues like data silos and access limitations beyond their scope, along with concerns about data quality, costs, and source reliability. Disaggregating the extensive data array to identify critical sources, datasets, use cases, and data pipelines is crucial to adopt an integrated ecosystem approach.

Given the specific priority per jurisdiction and the volume and granularity of data required to effectively understand the continuous change within DFS and FinTech ecosystems,[13] while addressing the limitations and challenges with conventional data collection processes, the following are identified as the overarching **data demand objectives** by regulators and policymakers:

✓ **SUPERVISION AND OVERSIGHT:** Essential data facilitate tailored regulatory requirements, targeted supervision, and oversight efficiency, enabling regulators to adopt a risk-based supervision framework, optimizing regulatory approaches.

✓ **MARKET INTELLIGENCE:** This data is necessary to remain proactive, informed, and up-to- date with emerging trends. Remaining informed of these trends requires comprehensive data from all entities, regulated or otherwise. This is especially critical

in jurisdictions with developing financial systems, helping identify risks, gaps for vulnerable segments such as women, older people and youth, and policy designs to promote innovation and inclusive growth.[14]

✓ **POLICY DECISION-MAKING:** Data-driven insights are vital for informed policy actions that promote financial inclusion, allowing regulators to effectively respond to market needs.

Many jurisdictions have responded to this challenge by embracing innovative digital solutions, which range from relatively simple digital tools and utilities such as web portal data for secure data submission and uploads, automated data submission via APIs (implemented by most regulators), to more sophisticated and complex solutions like the Supervision Information System (SIS) at the National Bank of Rwanda,[15] and the ORASS Portal (a SupTech solution) by the Bank of Ghana.[16]

These facilitate extensive data processing via "data push" or "data pull" methods.

Therefore, as regulators and financial supervisors review and plan an ecosystem-wide approach to data collection, usage, and reporting for the medium to long-term, the scope and focus for such a policy roadmap should not only cover structured data used by the regulatory and statistical functions but also extend beyond to unstructured data provided by both regulated and unregulated providers.

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[13] World Bank. 2022. Regulation and Supervision of Fintech: Considerations for EMDE Policymakers. Available at: https://documents1.worldbank.org/curated/en/099735204212215248/pdf/P173006033b45702d09522066cbc8338dc b.pdf

[14] Bank for International Settlements. 2020. Irving Fisher Committee (IFC) Report No. 10 - Central banks and fintech data issues. Available at: https://www.bis.org/ifc/publ/ifc_report_fintech_2002.pdf

[15] World Bank. 2021. The Next Wave of SupTech Innovation - SupTech Solutions for Market Conduct Supervision. Available at: https://documents1.worldbank.org/curated/en/735871616428497205/pdf/The-Next-Wave-of-Suptech- Innovation-Suptech-Solutions-for-Market-Conduct-Supervision.pdf

[16] For more information, visit: https://orassportal.bog.gov.gh/

FIGURE 8. CATEGORIES OF DATA IN THE FINTECH ECOSYSTEM

STRUCTURED DATA	UNSTRUCTURED DATA
• Required from licensed entities, following strict reporting schedules and indicators.	• Originates from a variety of sources.
• Comes in the form of reports, submissions, and data from sources such as the research and statistics department within central banks.	• Includes information received from a wide range of channels, such as customer feedback, social media, emails, complaints, associations, and various actors in the financial ecosystem.
• The reporting follows specific timelines, is based on predefined indicators, and can also encompass data from initiatives like mystery shopping.	• Flexible and not restricted to predefined formats or timelines.

The intent is to promote an open, collaborative, and resource-efficient approach to data collection, meeting the dual needs of supervision and informed decision-making.

Both data types can be sourced in real-time from diverse channels. Unstructured data, due to its nature, may come from traditional and non-traditional sources and requires clear mandates for use. See Table 3 for examples.

Annexure 3 provides an example of possible quantitative and qualitative types of data to be collected from FinTech or DFS providers in the respective jurisdiction.

[17] Project Ellipse: A collaborative initiative, launched by the Bank for International Settlements Innovation Hub in partnership with the Monetary Authority of Singapore, Bank of England, Financial Network Analytics, and Accenture, aiming to revolutionize the landscape of data-driven fintech supervision through an integrated regulatory data and analytics platform. For more information, visit: https://www.bis.org/about/bisih/topics/suptech_regtech/ellipse.htm

TABLE 3. VARIABLES AND SOURCES USED FOR STRUCTURED AND UNSTRUCTURED DATA COLLECTION

STRUCTURED AND UNSTRUCTURED DATA SOURCED BASED ON LICENSE/REGULATORY REQUIREMENTS, AND COMPLIANCE OBLIGATIONS, INCLUDING (BUT NOT LIMITED TO)	POTENTIAL SOURCES OF UNSTRUCTURED DATA RELEVANT FOR SUPERVISION, INTELLIGENCE, AND DECISION-MAKING OBJECTIVES INCLUDE (THIS IS NON-EXHAUSTIVE)
Internal audit/external audit reports and financial service/product performance data – uptime (availability), value, volume, frequency, etc.	Company Registration Authority – source aggregate information on potential new entrants and the nature of business, e.g. Individual jurisdictional company registrars, etc.
Customer and market coverage data – active customer base, distribution of access channels (including branches, agents, ATMs, POS, etc.) disaggregated by sex, age, location, age, etc.	App Store Providers – Aggregate information on mobile apps with financial service or product offerings, e.g. Google Play Store, Apple App Store, Samsung Galaxy Apps, Huawei App Store, etc.
Financial reporting covering liquidity, credit, and overall financial health data.	Venture capital and financing entities across the FinTech funding lifecycle – including local, sub-regional, regional, and global players.
Retail and commercial real estate data and movable and immovable assets and securities.	Sovereign FinTech ecosystem funds and development finance a support institutions.
Data relayed based on a Memorandum of Understanding (MoU) with other regulators, industry associations or oversight bodies.	SaaS, financial and digital payment solutions, and technology providers – basic infrastructure and technology stack providers.
Fraud, customer complaints, and redress related data.	Accelerators, innovation and entrepreneurial hubs, FinTech studios, community of practice (CoP), and industry associations.
Governance and senior management data.	Development partners, non-profits, foundations, and think tanks.
Security and cyber-hygiene related data updates.	Academia, research institutions, and the consulting industry.
Supply and demand side surveys on the financial sector.	Regulators lead exploratory research, pilots, engagements, supply, and demand side surveys.
Research outcomes led within the financial regulator or supervisor and market sentiment related data from social media, news, direct feedback/complaints, and mystery shopping.	Social media metrics, web scrapping and other sentiment a behavioral data collection and monitoring tools (robust SupTe tools).
Public-private dialogues, structure engagements, and forums, etc.	Industry engagements, forums, showcases and dialogues, e.g. AFI FinTech Showcase, AFI Global Policy Forum, Singapore FinTech Festival, Accion Inclusive 50, etc.

DATA COLLECTION SOURCES

According to the responses gathered from the AFI survey
(See **Figure 9**):

✓ Data is primarily sourced from the reports,
    compliance records, market research, and industry
    reports of regulated entities.

✓ Regular reviews are crucial as the financial
    ecosystem evolves.

According to the responses gathered from the AFI survey
(See **Figure 10**):

✓ Most respondents accept that technology enhances
    data collection in terms of frequency, granularity,
    and quality, facilitating better supervision.

FIGURE 9. FINTECH & DFS DATA: AFI NETWORK

*What kind of data related to FinTech and DFS does your institution and other financial regulators rely on?
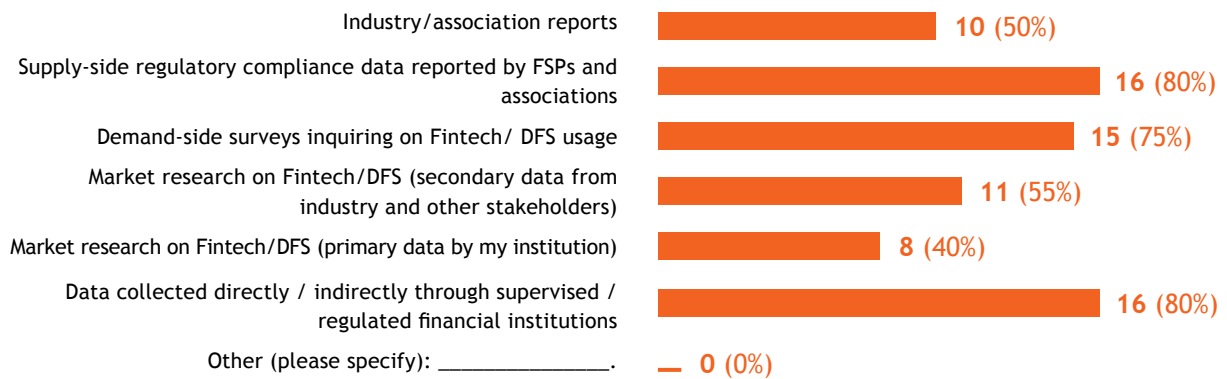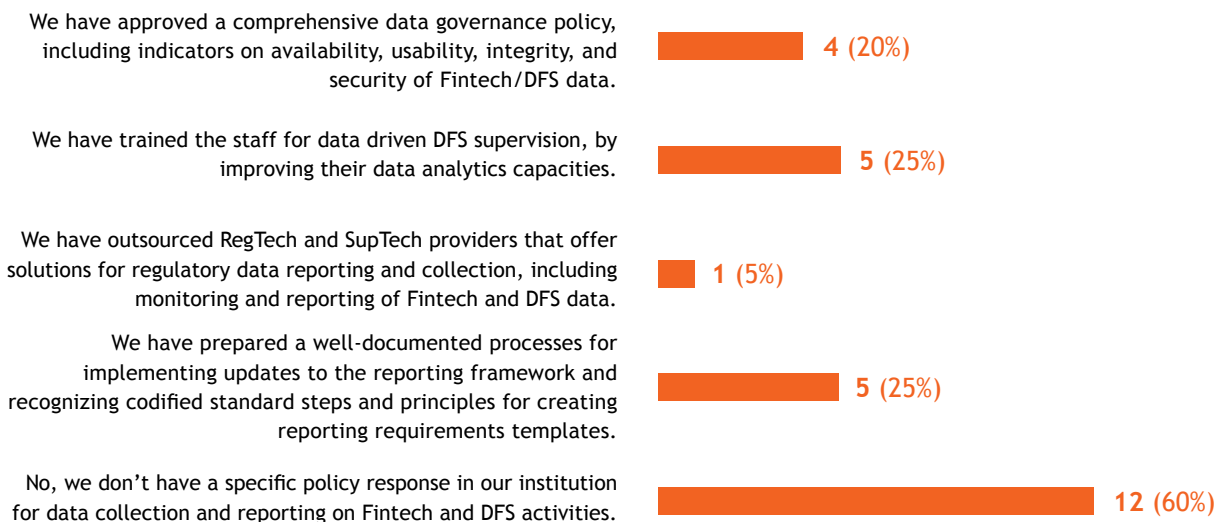(20 responses)*

Industry/association reports	**10 (50%)**
Supply-side regulatory compliance data reported by FSPs and associations	**16 (80%)**
Demand-side surveys inquiring on Fintech/ DFS usage	**15 (75%)**
Market research on Fintech/DFS (secondary data from industry and other stakeholders)	**11 (55%)**
Market research on Fintech/DFS (primary data by my institution)	**8 (40%)**
Data collected directly / indirectly through supervised / regulated financial institutions	**16 (80%)**
Other (please specify): _____.	**0 (0%)**

FIGURE 10. DATA COLLECTION MECHANISMS FOR FINTECH AND DFS ACTIVITIES: AFI NETWORK

Has your institution established a data collection mechanism for Fintech and DFS activities? (20 responses)

We have approved a comprehensive data governance policy, including indicators on availability, usability, integrity, and security of Fintech/DFS data.	**4 (20%)**
We have trained the staff for data driven DFS supervision, by improving their data analytics capacities.	**5 (25%)**
We have outsourced RegTech and SupTech providers that offer solutions for regulatory data reporting and collection, including monitoring and reporting of Fintech and DFS data.	**1 (5%)**
We have prepared a well-documented processes for implementing updates to the reporting framework and recognizing codified standard steps and principles for creating reporting requirements templates.	**5 (25%)**
No, we don't have a specific policy response in our institution for data collection and reporting on Fintech and DFS activities.	**12 (60%)**

BOX 1. G20 NEW DATA GAPS INITIATIVE FOR EMERGING POLICY ISSUES: NEW INDICATORS

The International Monetary Fund (IMF), in consultation with the G20 and participating economies, has developed the new workplan for the third initiative on data gaps (DGI-3), which was endorsed by G20 Leaders at their meeting in Bali in November 2022.

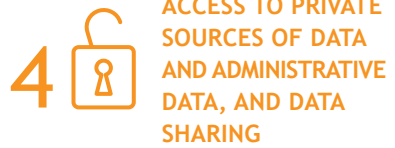The new workplan covers 14 recommendations under four main statistical and data priorities:

1 CLIMATE CHANGE

2 HOUSEHOLD DISTRIBUTIONAL

3 FINTECH AND FINANCIAL INCLUSION

4 ACCESS TO PRIVATE SOURCES OF DATA AND ADMINISTRATIVE DATA, AND DATA SHARING

THE RECOMMENDATIONS DIRECTLY RELATED TO THE DATA GAPS OF FINTECH AND FINANCIAL INCLUSION ARE:

FINTECH CREDIT

Enhance data collection and analysis to understand the access and usage of non-bank FinTech credit services and the risks that could affect global financial stability.
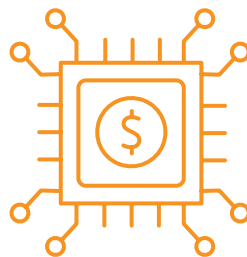
DIGITAL MONEY

Establishing a data collection framework to monitor the developments and any associated risks in the future, including the use of foreign Central Bank Digital Currencies (CBDCs), stablecoins, and other types of crypto assets used as means of payment, to ensure the proper implementation of monetary policy.

FINTECH-ENABLED FINANCIAL INCLUSION

Enhance the indicators covering access and usage of DFS through mobile payments, internet banking, and alternative financing platforms, to monitor the impact of financial innovation on financial inclusion, especially for the most vulnerable and financially underserved groups.

Source: IMF. G20 DGI Recommendations. Available at: G20 DGI Recommendations (imf.org)

2.5 AN ECOSYSTEM APPROACH TO DATA FOR SUPERVISION AND POLICY OBJECTIVES

This approach recognizes the interconnectedness of various stakeholders, enabling regulators and policymakers to gather comprehensive insights, promote collaboration, share resources, and develop agile policies that address the evolving needs of the market.

Central banks and policymakers adopt various methodologies to collect data on their DFS and FinTech ecosystems. Across the AFI network, the three conventional and innovative ways that data is collected are:

✓ **REGULATORY REPORTING BASED ON LICENSING REQUIREMENTS AND COMPLIANCE DEMAND**
This approach leverages the regulatory framework where in financial institutions, FSPs, and FinTechs are mandated to submit detailed reports based on their licensing conditions and compliance requirements. These reports often include financial statements, risk management information, and operational metrics, enabling central banks to monitor the entity's health and compliance with regulations.

The effectiveness of this approach lies in its systematic and compulsory nature, ensuring a consistent data flow essential for oversight and policy formulation. For instance, Mexico, Colombia, and Peru have expanded data collection to better understand their FinTech ecosystems.[18]

✓ **PUBLIC-PRIVATE PARTNERSHIPS THROUGH REGULATORY SANDBOXES OR INNOVATION INITIATIVES**
By encouraging public-private partnerships, central banks can engage directly with FinTech firms and financial institutions within a controlled environment, such as a regulatory sandbox. This setting allows for the testing of innovative financial products or services while ensuring regulatory oversight.

Such initiatives not only provide central banks with insights into emerging technologies and business models but also promote a collaborative environment where both regulators and industry participants can explore the implications of new financial innovations on market stability and consumer protection.

In line with their regulatory duties and mandate, some policymakers, such as those in Egypt and Brazil, require FinTech participants in their sandbox or innovation hub programs to report data, even if not officially regulated. However, this approach may not fully exploit the data collection potential from both licensed and unlicensed entities, nor does it always encourage data sharing for ecosystem growth.[19]

✓ **RESEARCH FUNCTIONS USING QUALITATIVE AND QUANTITATIVE RESEARCH METHODS**
Central banks employ their research divisions to conduct in-depth studies using a mix of qualitative and quantitative methods. This could include surveys, interviews, focus groups, and statistical analysis to understand market dynamics, consumer behavior, and financial trends. By integrating these traditional research methods, central banks can generate nuanced insights, forecast economic conditions, and evaluate the impact of policy decisions. This approach is foundational to a central bank's mandate, informing its regulatory actions and contributing to the overall stability of the financial system.

Therefore, the highest priority is for regulators to adapt swiftly to the changing DFS and FinTech environments, comprehensively capturing innovation data regardless of the innovating entity. This Guideline Note proposes a collaborative data collection, access, and utilization model, involving both conventional and unconventional data sources, resource sharing, mutually beneficial partnerships, and the adoption of relevant digital infrastructure utilization, ensuring that data is collected securely and responsibly.

Effective FinTech supervision requires collaboration with domestic and international peers, sharing data across sectors—including telecommunications—to coordinate responses to FinTech advancements.

Regulators must, therefore, collect data from entities outside traditional regulatory frameworks, employing an "Explore" approach for market intelligence, which is suggested to take on the policy roadmap proposed in this Guideline Note, leveraging the SPACE framework and its guiding principles.

[18] World Bank. 2022. Regulation and Supervision of Fintech: Considerations for EMDE Policymakers. Available at: https://documents1.worldbank.org/curated/en/099735204212215248/pdf/P173006033b45702d09522066cbc8338dc_b.pdf

[19] University of Cambridge. 2022. The Cambridge SupTech Report. Available at: https://lab.ccaf.io/wp-content/uploads/2023/01/Cambridge-State-of-SupTech-Report-2022.pdp

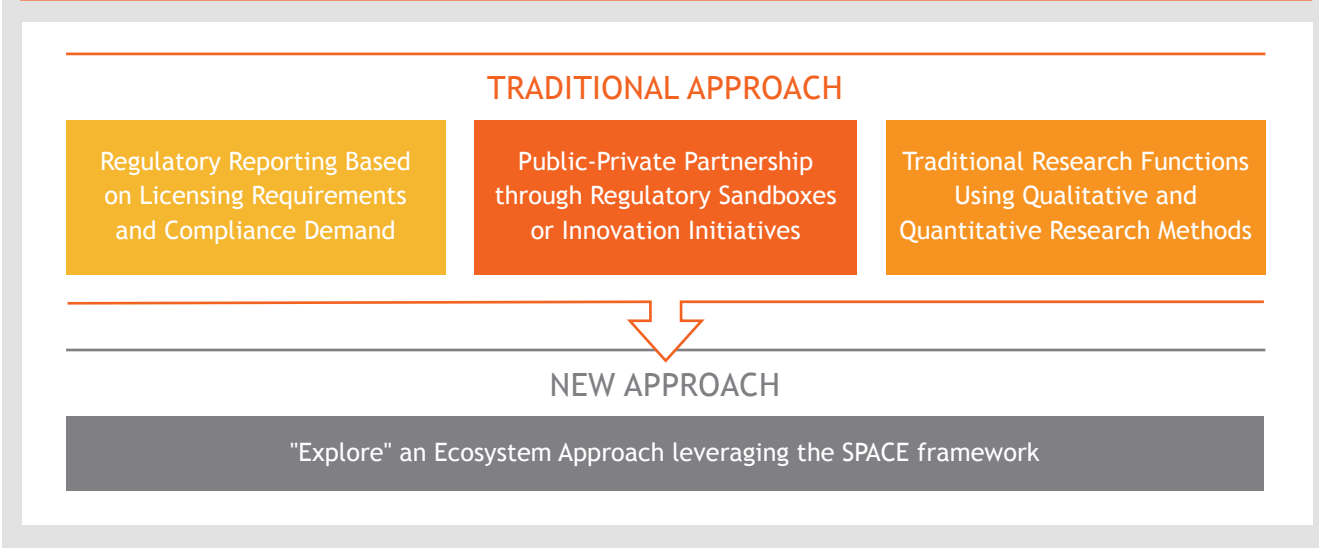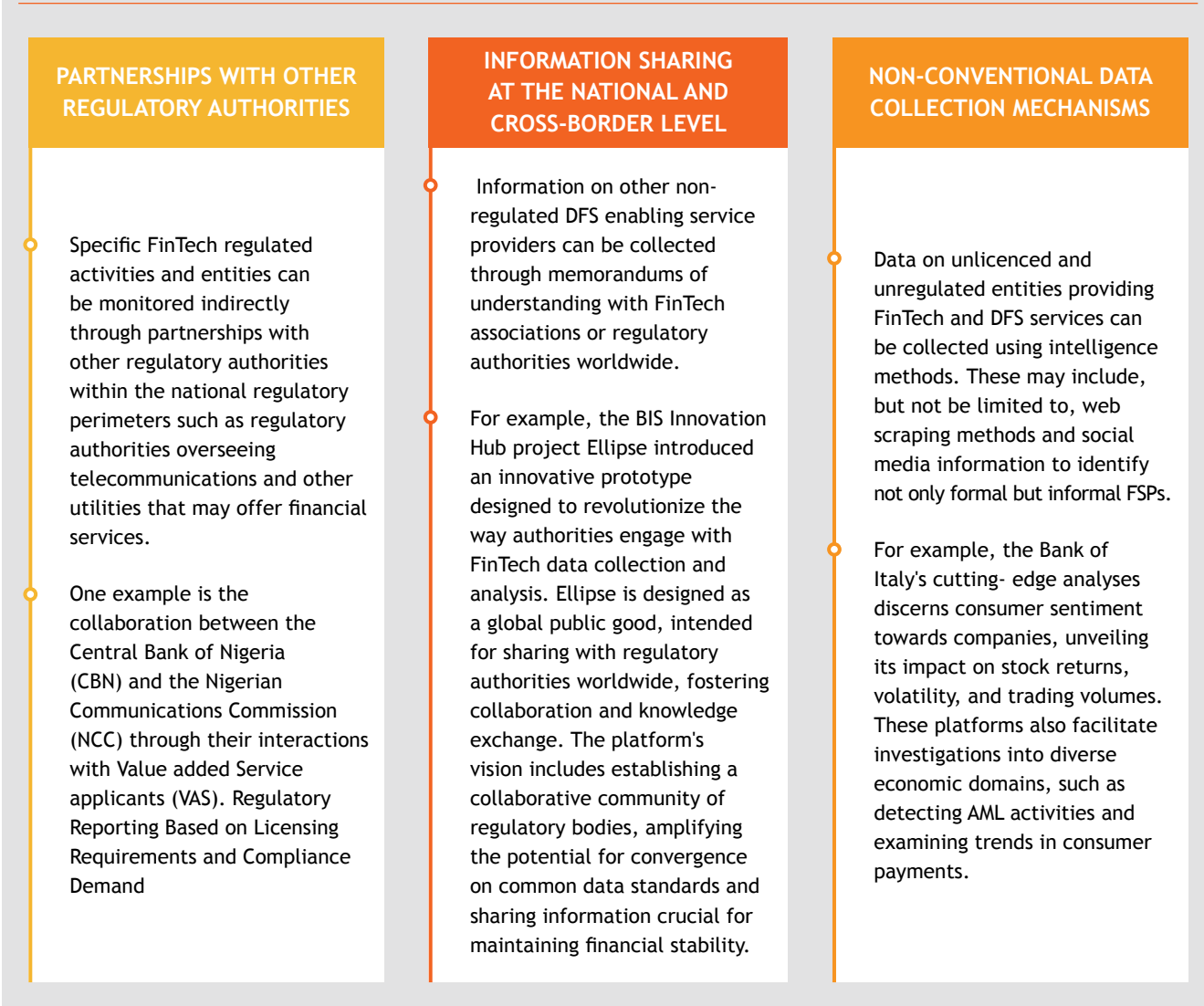**FIGURE 11.** FINTECH ECOSYSTEM DATA – BEYOND TRADITIONAL APPROACHES

TRADITIONAL APPROACH

Regulatory Reporting Based on Licensing Requirements and Compliance Demand	Public-Private Partnership through Regulatory Sandboxes or Innovation Initiatives	Traditional Research Functions Using Qualitative and Quantitative Research Methods

NEW APPROACH

"Explore" an Ecosystem Approach leveraging the SPACE framework

FIGURE 12. POSSIBLE NON-TRADITIONAL MEANS OF THE "EXPLORE" APPROACH

PARTNERSHIPS WITH OTHER REGULATORY AUTHORITIES

- Specific FinTech regulated activities and entities can be monitored indirectly through partnerships with other regulatory authorities within the national regulatory perimeters such as regulatory authorities overseeing telecommunications and other utilities that may offer financial services.

- One example is the collaboration between the Central Bank of Nigeria (CBN) and the Nigerian Communications Commission (NCC) through their interactions with Value added Service applicants (VAS). Regulatory Reporting Based on Licensing Requirements and Compliance Demand

INFORMATION SHARING AT THE NATIONAL AND CROSS-BORDER LEVEL

- Information on other non-regulated DFS enabling service providers can be collected through memorandums of understanding with FinTech associations or regulatory authorities worldwide.

- For example, the BIS Innovation Hub project Ellipse introduced an innovative prototype designed to revolutionize the way authorities engage with FinTech data collection and analysis. Ellipse is designed as a global public good, intended for sharing with regulatory authorities worldwide, fostering collaboration and knowledge exchange. The platform's vision includes establishing a collaborative community of regulatory bodies, amplifying the potential for convergence on common data standards and sharing information crucial for maintaining financial stability.

NON-CONVENTIONAL DATA COLLECTION MECHANISMS

- Data on unlicenced and unregulated entities providing FinTech and DFS services can be collected using intelligence methods. These may include, but not be limited to, web scraping methods and social media information to identify not only formal but informal FSPs.

- For example, the Bank of Italy's cutting-edge analyses discerns consumer sentiment towards companies, unveiling its impact on stock returns, volatility, and trading volumes. These platforms also facilitate investigations into diverse economic domains, such as detecting AML activities and examining trends in consumer payments.

Furthermore, regulators and financial authorities need to collaborate and coordinate with their peers to implement a sound supervisory response to FinTech developments in their respective jurisdictions.

This becomes especially relevant for those FinTech entities which operate in different jurisdictions or business contexts. In addition, supervisors need to invest in building capacities and establishing tools to identify innovative solutions in the FinTech market to address possible related risks such as cyber threats, data protection concerns, etc.

Given this reality and the daunting challenges with the current approaches to data collection, the likely successful solutions might not sit within siloed or top-to-bottom policy frameworks or guidelines, but a holistic, iterative, and integrated institution-industry wide collaboration, which sets out the aspirational vision for a mutually beneficial data collection regime and provides a map to guide all stakeholders on the transformation journey.

BOX 2. EU DIGITAL FINANCE PLATFORM: FOSTERING FINANCIAL INNOVATION

In September 2020, the European Commission (EC) unveiled its Digital Finance Strategy, a strategic blueprint aimed at cultivating a more competitive and inventive European financial sector. The EU Digital Finance Platform is evidence of this commitment, championing innovation in finance and striving to establish a unified market for digital financial services across the EU. This platform is a pioneering collaborative space at the heart of the EU's finance sector, which serves as a nexus, uniting innovative financial enterprises and national supervisors in a shared mission: To reinforce innovation within the EU's financial landscape.

KEY FEATURES OF THE EU DIGITAL FINANCE PLATFORM

DATA HUB

A centralized repository offering invaluable financial insights, fostering data-driven decision-making.

CROSS-BORDER SERVICES

Facilitating seamless financial services across EU borders, promoting collaboration and market integration.

FINTECH MAPPING

An interactive map spotlighting cutting-edge FinTech enterprises, encouraging networking, and collaborative opportunities.

POLICY UPDATES

Stay informed with the latest policy news, ensuring a deep understanding of the regulatory landscape.

CALLS TO ACTION AND EVENTS

Engage with industry events and participate in targeted initiatives, driving collaborative efforts and fostering innovation.

Source: Home | EU Digital Finance Platform (europa.eu)

SECTION III:
BUILDING AN ECOSYSTEM-DRIVEN DATA POLICY ROADMAP FOR MARKET INTELLIGENCE AND SUPERVISION

This Guideline Note supports AFI members in adopting an ecosystem methodology for data collection, enhancing supervision, market intelligence, and prioritized policy goals. The guidance within this strategic policy roadmap tackles complexities and legacy challenges by strategizing comprehensive data initiatives and involves evaluating the difficulties of collection, relevance, and costs, understanding ecosystem obligations and collaboration, and innovating in data sourcing, all while ensuring quality, benefits, responsibility, and sustainability.

The Strategic Policy Roadmap, structured around five core pillars within the SPACE framework, offers both technical and policy guidance, and aligns with the ADKAR change management model[20] to facilitate a structured transition to sustainability in data collection and usage practices for jurisdictions.

Additionally, the success of financial regulators and supervisors in utilizing DFS and FinTech ecosystem data for supervision and intelligence depends on a cohesive strategy, not simply on policy issuance.

This strategy must be jointly adopted, endorsed, and executed with industry, partners, and stakeholders. The SPACE framework delineates roles for policymakers and regulators in enablement and active leadership where necessary, promoting mutual and sustainable engagement for implementation. Significantly, the recommendations and guiding principles provided under the SPACE framework are anchored in three core objectives: (i) supervision and oversight; (ii) intelligence; and (iii) policy action and decision-making.

The assumption within the context of this Guideline Note is that these objectives are integral to financial regulators and policymakers as they develop a data policy roadmap that is both ecosystem-driven and collaborative.

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[20] Alliance for Financial Inclusion. 2023. Policy Framework on Developing a National FinTech Strategy. Available at: https://www.afi-global.org/publications/policy-framework-on-developing-a-national-fintech-strategy/

FIGURE 13. CORE OBJECTIVES FOR THE SPACE FRAMEWORK

SUPERVISION AND OVERSIGHT

Develop a data-centric ecosystem framework to enhance the capability of financial policymakers in ensuring compliance, maintaining systemic resilience, and sustaining financial inclusion.

INTELLIGENCE

Implement an integrated data policy roadmap that empowers financial regulators with predictive insights for proactive market regulation, trend analysis, and financial inclusion monitoring.

POLICY ACTION AND DECISION-MAKING

Develop a collaborative data policy roadmap that informs and accelerates responsive and informed policymaking in the financial sector towards promoting financial inclusion and other policy objectives.

3.1 PILLAR 1: STATE THE VISION FOR A LONG-TERM, ECOSYSTEM DATA POLICY ROADMAP

Similar to other strategic policy document development approaches, such as the National FinTech Strategy[21] and the National Financial Inclusion Strategy,[22] articulating and establishing the vision for a long-term ecosystem data policy roadmap is pertinent for the future of data collection in any jurisdiction. Moreover, it is an important first step and a vital indicator to gauge the level of adoption, involvement, and contributions from industry, peers, partners and stakeholders.

Policy Framework on Developing a National FinTech Strategy
> View here

Policy Model for National Financial Inclusion Strategy
> View here
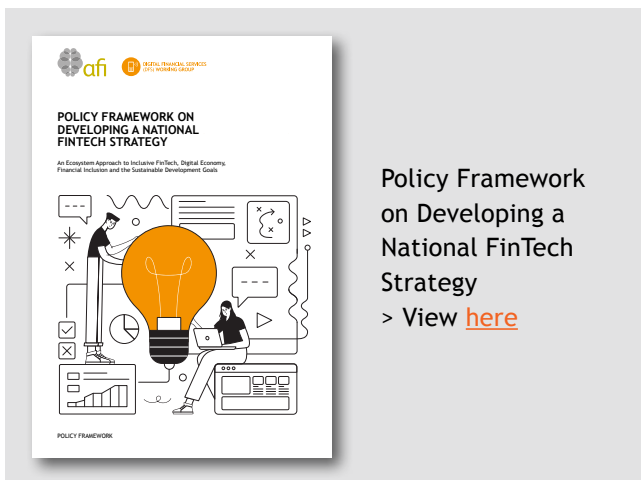
The vision statement should present the long-term and future strategic goals for the financial supervisor or regulator and clearly communicate the vision and transformation outcome expected for the ecosystem. The right vision statement should act as the needed compass providing a compelling direction for the entire DFS and FinTech ecosystem.

> **Our vision for data collection is that 'the Bank gets the data it needs to fulfill its mission at the lowest possible cost to industry.**
>
> Example of the vision statement by the Bank of England (2021)

The vision statement for an ecosystem-driven data policy roadmap focusing on enhanced market intelligence, supervision and oversight, and improved policy decision-making, must articulate and champion the needed reforms both internally within the regulators and at the industry level.
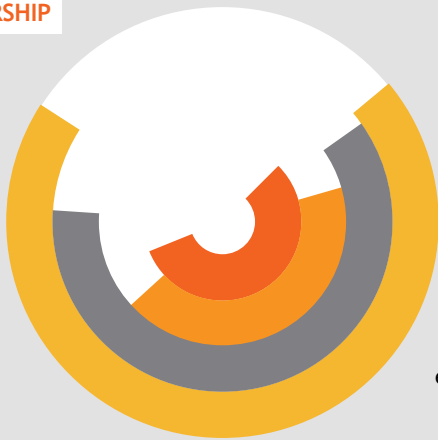
This pillar sits within the enablement zone, which defines the need for change and clearly sets out the importance of the policy roadmap (ideation or concept stage) in achieving the financial policymaker's vision of improving data collection for a net positive ecosystem outcome.[23]

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[21] Alliance for Financial Inclusion. 2023. Policy Framework on Developing a National FinTech Strategy. Available at: https://www.afi-global.org/publications/policy-framework-on-developing-a-national-fintech-strategy/

[22] Alliance for Financial Inclusion. 2020. Policy Model for National Financial Inclusion Strategy. Available at: https://www.afi-global.org/publications/policy-model-for-national-financial-inclusion-strategy/

[23] Bank of England. 2021. Transforming data collection from the UK financial sector: a plan for 2021 and beyond. Available at: https://www.bankofengland.co.uk/paper/2021/transforming-data-collection-from-the-uk-financial-sector-a-plan-for-2021-and-beyond

FIGURE 14. GUIDING PRINCIPLES - VISION FOR AN ECOSYSTEM DATA POLICY ROADMAP

HIGH LEVEL LEADERSHIP AND OWNERSHIP

The vision must communicate a clear commitment, responsibility, openness, transparency, shared values, proportionality, standards, and respect for industry and stakeholders.

TRANSFORMATIONAL

The vision must be clear and unambiguous, signaling the compelling direction and expected future state of the ecosystem and the net positive benefits and value to all stakeholders.

MULTI-PHASED IMPLEMENTATION

Data collection interventions must be agile and lean by design, ensuring effective management of scarce resources, and an incremental learning and improvement ethos.

LONG-TERM: MULTI-YEAR

While data collection helps deliver insights and better decisions to deal with emerging risks, the vision must be precise and long-term to remain consistent and respond to unpredictable shocks.

BOX 3. EU'S COMMON FINANCIAL DATA SPACE INITIATIVE[24]

The European Commission (EC) underscores the urgent need for enhanced data access and sharing within the EU. By encouraging broader access to both public and private data, this initiative aims to benefit individuals, businesses, and the wider public interest. To achieve these goals, the EC is leading the establishment of a common financial data space, a pivotal step in integrating European capital markets, promoting sustainable investments, driving innovation, and enhancing efficiency for consumers and businesses.

KEY OBJECTIVES AND MEASURES

REAL-TIME DIGITAL ACCESS

Enabling real-time digital access to all regulated financial information, ensuring transparency and accessibility for stakeholders.

INNOVATIVE IT TOOLS

Promoting innovative IT tools to simplify reporting and supervision processes, promoting efficiency and accuracy in financial operations.

OPEN FINANCE

Supporting "open finance" to encourage seamless business-to-business data sharing within the EU financial sector and beyond.

KEY ACTIONS

STANDARDIZED DATA FORMATS

EU legislation will be amended to ensure that publicly disclosed information is available in standardized and machine-readable formats. An EU-funded infrastructure for public disclosure will be established, enhancing accessibility and transparency.

SUPERVISORY DATA STRATEGY

A comprehensive strategy on supervisory data was presented in 2021, forming a foundational pillar of the initiative.

OPEN FINANCE FRAMEWORK

A new legislative proposal for open finance was introduced in 2022, to align with the broader data access initiatives, a cohesive and integrated approach to data sharing and accessibility.

In collaboration with the European Supervisory Authorities (ESAs) and a group of data experts, these strategic measures aim to pave the way for a robust and interconnected financial data ecosystem in the European Union.

Source: https://finance.ec.europa.eu/publications/digital-finance-package_en

[24] Digital Finance Strategy for the EU: Promoting data-driven innovation in finance by establishing a common financial data space (Priority Three). Please see: https://www.pwc.com/mt/en/publications/asset- management/a-brief-run-through-of-the-european-union-digital-finance-package.html

3.2 PILLAR 2: PRESENT A PRAGMATIC POLICY APPROACH ESTABLISHED ON CORE GUIDING PRINCIPLES

This Pillar proposes core Guiding Principles (GPs) followed by a set of key recommendations to ensure the policy roadmap for an ecosystem-driven data collection project is well-anchored and demonstrates clear policy guidance.

It is important to note that the guiding principles (GPs) and recommendations are not meant to be regarded as mandatory, but rather good foundations for thinking through the design and implementation of the policy roadmap, including improving the data collection and analysis processes.

Depending on the specific country context, regulatory provisions might require extensive levels of detail, compared to those suggested in this document. Additionally, these provisions can be tailored to better reflect the state of practice of FinTech entities, DFS activities and technology enablers in each country.

The GPs can be implemented through various avenues, such as by designing regulatory frameworks or guidance or by signing memorandums of understanding or cooperation agreements between different regulatory authorities and industry associations and pertinent policy-making bodies.

FIGURE 15. GUIDING PRINCIPLES FOR A PRAGMATIC AND ITERATIVE APPROACH

GUIDING PRINCIPLE 1

Articulate the Rationale, Data Relevance, and Alignment with the Vision for an Ecosystem Data Policy Roadmap

GP 1

GUIDING PRINCIPLE 2

Apply a risk-based approach to collaborative data collection, validation, application, and use

GP 2

GUIDING PRINCIPLE 3

Develop and implement a sustainable data collection process with established data quality and control mechanisms

GP 3

GUIDING PRINCIPLE 4

Leverage Innovative Technologies, and Build the Capacity and Capabilities of Staff

GP 4

GUIDING PRINCIPLE 5

Benchmark and learn from peers

GP 5

TABLE 4. GUIDING PRINCIPLES OF A PRAGMATIC AND ITERATIVE POLICY APPROACH

GP 1	GP 2	GP 3	GP 4	GP 5
ARTICULATE THE RATIONALE, DATA RELEVANCE, AND ALIGNMENT WITH THE VISION FOR AN ECOSYSTEM DATA POLICY ROADMAP	APPLY A RISK-BASED APPROACH TO COLLECTIVE EXPERIMENTATION AND COLLABORATIVE DATA COLLECTION, VALIDATION, APPLICATION, AND USE	DEVELOP, IMPLEMENT, MAINTAIN, AND ENHANCE A SUSTAINABLE DATA COLLECTION PROCESS WITH ESTABLISHED DATA QUALITY AND CONTROL MECHANISMS	LEVERAGE INNOVATIVE TECHNOLOGIES, AND BUILD THE CAPACITY AND CAPABILITIES OF STAFF	BENCHMARK AND LEARN FROM PEERS
WHY	WHAT	HOW	WHO	HOW OTHERS DO IT

EXPANDED GUIDING PRINCIPLES

1.1

Clearly articulate why regulators need data from a wide spectrum of stakeholders and sources, ensuring alignment with the mandate and respective vision for an ecosystem data policy roadmap.

1.2

Prioritize data elements that hold significant and relevant value for informed decision-making, policy transformation, and ecosystem development.

1.3

Actively collaborate and establish partnerships and data- sharing agreements with ecosystem stakeholders.

2.1

Identify the risks associated with stakeholder-driven data collection and aggregation, including potential threats to the regulator's mandate, reputation, and financial system integrity.

2.2

Ensure comprehensive and efficient mandatory and voluntary reporting requirements with clear guidance and incentives.

2.3

Develop mechanisms to conduct a FinTech landscape census or mapping exercises periodically to validate data baselines.

2.4

Identify relevant structured and unstructured demand and supply-side data.

3.1

Establish user friendly reporting mechanisms and standardized data formats and protocols to reduce the regulatory burden and enhance access to regulatory support.

3.2

Create data collection mechanisms for ongoing data sharing and updates.

3.3

Avoid any overlapping of regulatory or voluntary data being collected and ensure transparency.

3.4

Provide actionable recommendations for data collection, addressing both consumer and service provider perspectives.

3.5

Establish, maintain, and enhance a sustainable data collection mechanism.

4.1

Explore the opportunities and roles for technologies, such as RegTech, SupTech, and AI, in data analytics and invest in technology infrastructure that enables efficient data processing.

4.2

Strengthen the analytical skills and expertise of regulatory staff by providing training and resources to effectively navigate emerging technologies, data analytics, and supervisory practices.

5.1

Identify key performance indicators (KPIs) that are relevant to your benchmarking objectives.

5.2

Select Benchmarking Partners: Identify other central banks or regulatory authorities which have already accomplished or made significant progress in your area of interest.

5.3

Periodically review your benchmarking process to ensure it remains aligned with your institution's goals and objectives. As the FinTech industry evolves, you may need to adjust your benchmarking strategy accordingly.

GUIDING PRINCIPLE 1

Articulate the Rationale, Data Relevance, and Alignment with the Vision for an Ecosystem Data Policy Roadmap

1 | **Articulate the rationale, data relevance, and alignment with the vision for an ecosystem-driven data policy roadmap**

✓ Financial regulators should articulate the strategic importance of data in understanding and overseeing the FinTech and DFS ecosystem. This involves mapping out how data supports the regulatory mandates, like monitoring market trends, detecting risks, and ensuring compliance. The articulation should connect the data strategy or policy roadmap with overarching regulatory goals, demonstrating how data insights facilitate informed policymaking and effective supervision.

✓ Establish a robust legal and methodological framework for data collection, ensuring it aligns with international best practices and respects privacy and data protection standards. This includes defining the legal basis for data requests, ensuring data relevance, and maintaining alignment with evolving financial landscapes and technologies.

✓ Develop an understanding of the FinTech and DFS ecosystem's dynamics, including key actors, activities, and interconnections, to inform a taxonomy that guides data collection. This taxonomy should evolve with the ecosystem, incorporating emerging FinTech models and services to remain relevant and actionable.

✓ Define the necessity of diverse data collection aligned with the regulatory vision, emphasizing its objective clarity, legal foundation, and continual reassessment to identify cross-border activities and non-regulatory entities, while addressing technological impacts on service delivery.

✓ Emphasize proactive data requirement reviews, transparency in collection methods, and stakeholder communication to underscore the shared necessity for ecosystem insights.

2 | **Prioritize significant and relevant data for informed decision-making and ecosystem development**

✓ Implement a data prioritization framework that identifies key data elements critical for regulatory objectives, such as monitoring financial stability, consumer protection, market integrity and financial inclusion. This involves assessing the value and impact of different data types and focusing on those that offer the greatest insights or risk mitigation potential.

✓ Leverage advanced technologies, such as AI and machine learning, to enhance data analysis capabilities, enabling more nuanced and predictive insights into the FinTech and DFS sector.

✓ Develop flexible and adaptive reporting frameworks that can accommodate the diversity of FinTech business models, ensuring that data collection is both comprehensive and proportional to the entities' risk profiles, market impacts, capacities, and capabilities.

3 | **Encourage collaboration and establish data-sharing frameworks with ecosystem stakeholders**

✓ Engage with a broad spectrum of stakeholders, including other regulators, FinTech firms, traditional financial institutions, and academia, to promote a collaborative approach to ecosystem understanding and oversight. This engagement should aim to develop shared visions, mutual understanding, and joint initiatives for data collection, sharing, and analysis.

✓ Establish formal agreements and platforms that facilitate secure and efficient data collection, sharing, archiving, and disposal among stakeholders, respecting confidentiality and data protection norms. This could include developing shared data repositories or adoption of distributed ledger technologies that enhance transparency and accessibility.

✓ Promote capacity building and knowledge sharing among stakeholders to ensure that all ecosystem participants understand the value of data, collection and sharing, the importance of data quality, and the methodologies for data analysis. This could involve regular workshops, joint research initiatives, and shared best practices.

BOX 4. ESTRENGTHENING BILATERAL TIES: EGYPT AND JORDAN ENHANCE BANKING SUPERVISION COOPERATION ON FINTECH

The Central Bank of Egypt (CBE) and Central Bank of Jordan (CBJ) have solidified their enduring partnership by signing a Memorandum of Understanding (MoU) to establish a formal framework for collaborative efforts between the two countries in banking supervision. The MoU specifically focuses on enhancing cooperation in overseeing e- payment systems and services, as well as emerging areas of FinTech. By encouraging this synergy, Egypt and Jordan are poised to open new avenues for cooperation and innovation. Both the CBE and CBJ are committed to leveraging this collaboration to create secure and efficient e-payment systems in both nations and promote the mutual adoption of cutting-edge financial technologies, paving the way for the implementation of exceptional international best practices and innovative business models.

Source: Central Bank of Egypt. A vailable at: https://www .cbe.org.eg/en/news- publications/news/2023/03/08/cbe-strengthens-means-of-cooperation-with-the-central-bank-of-jordan

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GUIDING PRINCIPLE 2

Apply a Risk-Based Approach to Collective Experimentation and Collaborative Data Collection, Validation, Application, and Use

1 **Identify the risks associated with stakeholder-driven data collection and aggregation, including potential threats to the regulator's mandate, reputation, and financial system integrity.**

✓ Implement a nuanced risk assessment framework for data collection, focusing onhigh-risk domains to safeguard financial stability and consumer interests.

✓ Establish tailored reporting protocols for digital financial and FinTech sectors based on their risk profiles, enhancing data accuracy and relevance.

✓ Prioritize the integration and efficient management of data from regulated entities and broader market indicators, specifying public data disclosure requirements for non-regulated FinTech participants.

✓ Regularly update risk assessment metrics and ensure robust data protection measures to maintain data integrity and stakeholder trust.

2 **Ensure comprehensive and efficient mandatory and voluntary reporting requirements with clear guidance and incentives.**

✓ Schedule systematic data collection to capture pertinent FinTech developments, aligning reporting mandates with industry risk levels to prevent regulatory fatigue.

✓ Identify diverse data acquisition channels, including regulatory filings, financial disclosures, industry publications, and web-based sources, ensuring clear data utility communication for informed policymaking.

✓ Promote regulatory collaboration, establishing data-sharing protocols to enhance market oversight and ecosystem understanding, promoting adaptability in response to evolving sector dynamics.

3 **Develop mechanisms to periodically conduct a FinTech landscape census or mapping exercises to validate data baselines.**

✓ Encourage agile and adaptive data strategies, validating new standards and practices within a sandbox framework to ensure relevance and effectiveness.

✓ Conduct comprehensive FinTech ecosystem mapping to establish a detailed sector database, leveraging both manual and automated data collection methods for exhaustive business model insights.

Facilitate cross-institutional collaboration for comprehensive FinTech monitoring, incorporating diverse data streams from licensing records, transaction data, and consumer feedback to inform regulatory actions and ecosystem development.

4 | **Identify relevant structured and unstructured demand and supply-side data.**

✓ Define clear reporting frameworks for both regulated and unregulated FinTech sectors, identifying key quantitative and qualitative data elements essential for nuanced market analysis.

✓ Establish mechanisms for real-time, granular data collection, integrating structured and unstructured data sources to support multifaceted market analysis and decision-making.

✓ Utilize both primary and secondary data, harnessing international surveys and local market research to gauge consumer behaviors, preferences, and emerging FinTech utilization trends, ensuring comprehensive market intelligence and informed policy formulation.

GUIDING PRINCIPLE 3

Develop, Implement, Maintain, and Enhance a Sustainable Data Collection Process with Established Data Quality and Control Mechanisms

1 | **Develop user-centric reporting mechanisms and establish uniform data standards and protocols to alleviate regulatory burdens and improve access to regulatory support.**

✓ Assess data consistency and adhere to data format standards, eliminating superfluous data fields to prevent inflated compliance costs and the potential for inaccuracies in reporting and ensure uniform reporting mandates across diverse institutions for identical financial activities.

✓ Compile and periodically revise a comprehensive list of all regulatory reporting requirements for every regulated entity, aiding in the appraisal of the overall reporting load.

✓ Formulate and adopt codified guidelines with precise data descriptions at both organizational and national levels to prevent misinterpretations and discrepancies, and devise reporting mandates, encompassing modifications or additions to existing report structures or the inception of new ones, while minimizing frequent alterations and brief implementation phases for both industry and policymakers.

✓ Embed quality control protocols directly within the system to validate data authenticity and initiate quality assurance strategies early in the data distribution chain to preclude ambiguities in data entry by reporters.

✓ Minimize manual data verification methods such as random checks or spreadsheet computations, which are error-prone and labor-intensive for regulators.

✓ Institute a comprehensive and well-supported governance structure, for data standards and ethical data management, ensuring transparency, accountability, and continuity with legal and operational oversight bodies, and appoint a senior official, such as a Chief Data Governance Officer, to lead policy directives.

✓ Emphasize performance and efficiency by enhancing data process flows for rapidity and precision, adopting real-time data handling where feasible, and automating routine operations.

✓ Promote a cybersecurity culture, emphasizing readiness and resilience, through encryption and secure data exchange practices, including adopting consistent and reliable data collection and storage solutions, active industry standardization endeavors, and routine legal, security, and process evaluations to remain well- informed of evolving data and security prerequisites.

✓ Ensure effective internal communications within the regulator or supervisor concerning data handling and reporting responsibilities.

2 | **Create data collection mechanisms for ongoing data sharing and updates.**

✓ Utilize data integration tools to consolidate regulatory reporting across different agencies and manage the extensive detail and volume of data essential for supervisory roles.

✔ Design data mapping protocols to clarify data responsibility and sharing logistics, identifying common data requisites across various authorities. This includes strengthening interdepartmental collaboration to prevent data gathering fragmentation and redundancy.

✔ Initiate data standardization methodologies, extending coordination nationwide to leverage synergies among data-utilizing agencies.

✔ Align departmental data procurement strategies with specific requirements, optimizing data collection tools to ease institutional reporting burdens.

✔ Enforce data transfer protocols ensuring equivalent privacy standards or contractual safeguards for cross-border data exchanges.

3 | Eliminate redundancies in data acquisition and guarantee transparency.

✔ Champion data interchange initiatives to prevent redundant data collection by different bodies and nominate a unified data repository to serve as the authoritative source for DFS-related information.

✔ Maintain data in strict adherence to legal standards, making sure it is kept only as long as necessary for its intended analytical use by clarifying the purposes of data use to entities, particularly for voluntary disclosures, underscoring its role in risk analysis and regulatory oversight.

✔ Initiate collaborative ventures with industry stakeholders for shared innovation, including undertaking joint audits on data infrastructure and workflows with industry participants.

✔ Execute thorough data gap analyses to delineate data custody and sharing responsibilities, identifying shared data requirements across entities, and ensure prompt, exhaustive, and precise data collection from both regulated and non- regulated entities.

4 | Offer practical recommendations for data gathering, addressing both consumer and provider perspectives.

✔ Clarify the consumer benefits derived from data collection, focusing on enhanced experiences and improved financial service customization.

✔ Investigate the technologies employed to deliver consumer-oriented services.

✔ Assess the initiatives and measures adopted by FinTech and DFS providers to broaden financial inclusion among marginalized demographics, such as women.

✔ Adopt an ecosystem approach to gauge financial inclusivity metrics, ensuring the reporting of disaggregated gender data.

✔ Establish and monitor new indicators to directly evaluate FinTech and DFS impacts on financial inclusion.

5 | Build, sustain, and refine effective data collection mechanisms.

✔ Form a multi-disciplinary panel to periodically reassess and refine strategies in response to the ecosystem's evolving demands, such as identifying and prioritizing stakeholder requirements, and striving for a comprehensive approach that addresses the varied needs across the ecosystem.

✔ Implement, collect data, and track KPIs to assess the policy's impact on each stakeholder group.

✔ Regularly solicit stakeholder feedback to gauge the value and effectiveness of the enacted measures, including establishing ongoing feedback channels for stakeholder input, facilitating adaptive and responsive policy evolution.

✔ Perform consistent reviews post-implementation to pinpoint improvement opportunities and develop a thorough monitoring and evaluation system to measure the sustainability and efficacy of data activities, ensuring adherence to principles and strategic alignment.

✔ Periodically evaluate and update the digital infrastructure, integrating emerging technologies and best practices.

✔ Encourage cooperative initiatives that unite stakeholders around common objectives, enhancing collective problem-solving.

✔ Proactively engage in industry dialogues and forums to stay informed of broader trends while contributing insights.

BOX 5. ENHANCING FINANCIAL INCLUSION THROUGH FINTECH PROMOTION IN EGYPT: A COLLABORATIVE STRATEGIC APPROACH

In alignment with "Egypt's Vision 2030" and its Sustainable Development Strategy, the CBE has championed financial inclusion as a pivotal element in promoting economic and social justice. To realize this vision, the CBE established the External Data Committee for Financial Inclusion in February 2019.

This committee serves as a nexus, bringing together diverse stakeholders, including the Financial Regulatory Authority, Ministry of Finance, Ministry of Communication and IT, Ministry of Trade and Industry, and other key entities. Their collective mission is to harmonize efforts, ensuring collaboration and coordination, and defining crucial indicators in line with international standards set forth by the G20 and the Alliance for Financial Inclusion. Key objectives encompass facilitating access to financial services, expanding DFS, and enhancing the Financial Technology and Digital Financial Infrastructure of MSMEs and startups, targeting sustainable growth in Egypt's financial sector. This concerted effort emphasizes the importance of a united approach in driving Egypt towards a more inclusive and economically vibrant future.

Source: Central Bank of Egypt website

GUIDING PRINCIPLE 4

Leverage Innovative Technologies, and Build the Capacity and Capabilities of Staff

1 | **Leverage Advanced Technologies for Enhanced Data Analytics and Infrastructure**

✓ Invest in technology infrastructure that supports efficient data processing, utilizing RegTech, SupTech, and AI for advanced data analytics.

✓ Develop staff competencies in machine learning, AI, and diverse programming languages to convert data into actionable insights.

✓ Use analytical tools to produce supervisory reports and establish integrated platforms, like APIs or web-based portals, for streamlined data submission from regulated and non-regulated entities.

✓ Incorporate automated systems and robust data infrastructure to improve data management, risk supervision, and policymaking, while promoting digital innovation and inclusion.

✓ Employ innovative technologies, including AI chatbots and APIs, to gather diverse data sets and utilize machine learning for predictive analytics and trend analysis.

✓ Emphasize scalable cloud-based solutions for data handling and ensure the strategic evaluation of technology investments to maximize benefits and efficiency.

2 | **Enhance Regulatory Staff Expertise and Collaboration in FinTech and Data Analytics**

✓ Strengthen the analytical capabilities of regulatory personnel through targeted training in emerging technologies and data analytics.

✓ Establish a FinTech Unit to monitor market trends and encourage international collaboration through MoUs with peer and other relevant global entities.

✓ Engage with international forums and partnerships to share knowledge and best practices.

✓ Focus on developing a skilled workforce adept in big data, ML, and AI, ensuring a talent pipeline that can navigate the complexities of digital finance.

✓ Provide continuous learning opportunities and encourage a culture of innovation, facilitating knowledge exchange and enhancing the capacity for data-driven decision-making in the FinTech and financial sectors.

GUIDING PRINCIPLE 4

Benchmark and Learn from Peers

1 **Identify key performance indicators (KPIs) that are relevant to your benchmarking objectives.**

✓ Adopt international standards or peer benchmarks to evaluate FinTech-related risks and referencing mechanisms, taking guidance from relevant AFI knowledge products or appropriate publications.

✓ Define precise benchmarking goals to clarify your targets and what you intend to accomplish, ensuring these goals are strategic and aligned with organizational priorities.

✓ Set SMART targets for improvements, focusing on addressing identified performance gaps through actionable insights derived from best practices within the industry.

✓ Utilize advanced data analytics for effective comparison and evaluation, ensuring the data relevance and accuracy to the set objectives.

✓ Implement a robust monitoring system to track progress towards the set targets, using KPIs to measure and adapt strategies in response to dynamic changes and outcomes.

2 **Select Benchmarking Partners:**

✓ Identify other central banks or regulatory authorities which have already accomplished or made significant progress in your area of interest, leveraging their experiences for mutual learning.

✓ Analyze the operational methodologies, technological tools, and strategic initiatives of these partners to distill best practices and innovative approaches that can be adapted to your context.

3 **Continuously Optimize Benchmarking Practices**

✓ Regularly reassess your benchmarking framework to ensure it stays relevant and responsive to the evolving FinTech landscape, aligning it with your institution's strategic objectives.

✓ Develop a comprehensive action plan based on benchmarking insights, detailing the steps necessary for implementing identified improvements.

✓ Execute the action plan with diligent oversight, adjusting your institution's processes, technologies, and strategies as needed while keeping a close eye on the implementation phases.

✓ Communicate the outcomes and progress of your benchmarking initiatives to internal stakeholders, fostering a culture of transparency, accountability, and continuous improvement within your organization.

BOX 6. INTERNATIONAL BENCHMARKING OF THE NIGERIAN FINTECH ECOSYSTEM

Under the umbrella of the National FinTech Strategy, the Central Bank of Nigeria (CBN) has strategically benchmarked the Nigerian FinTech ecosystem against global counterparts. Categorizing regulatory responses into three distinct models, the CBN meticulously analyzed countries such as Singapore (representing regulated frameworks), the US, Ecuador, Bolivia, China, and South Korea (representing bans on FinTech activities), and the UK, Spain, and Australia (representing proactive promotion by financial authorities). The CBN's benchmarking process identified the UK as an exemplary model among high-income nations and Egypt among lower middle-income countries, recognizing their outstanding National FinTech Strategy Development practices. Focused on supply, demand, and regulatory aspects, the CBN conducted an in-depth analysis, comparing the Nigerian FinTech ecosystem against regulatory responses from the United Kingdom, China, and Singapore. This systematic approach allows the CBN to discern the strengths and weaknesses within Nigeria's FinTech landscape, providing valuable insights for strategic enhancements and promoting a vibrant, innovative, and resilient FinTech sector in the country.

Source: Nigeria's National FinTech Strategy 2023. Available at: https://www.afi-global.org/publications/nigerias-national-fintech-strategy-2023/

3.3 PILLAR 3: ADVOCATE COLLECTIVE EXPERIMENTATION AND INCREMENTAL IMPROVEMENTS

This pillar outlines the critical need for collective experimentation by all parties within the DFS and FinTech ecosystem, focusing on the mitigation of legacy data, processes, and siloes, and the encouragement of incremental improvements by all stakeholders involved in implementing the policy roadmap for comprehensive data collection and use.

Under this pillar, which sits within the enablement zone in the overall transformation process, joint preparation between the regulator and industry (and other stakeholders more broadly) around how to promote collective experimentation and formalize incremental improvements, is crucial to success.

COLLECTIVE EXPERIMENTATION AND ADDRESSING LEGACY CHALLENGES

With several FSPs burdened with legacy systems and siloed data sources, which are highly likely to be expensive to manage, inefficient and resource-heavy, in terms of data collection and flow, financial regulators must promote an environment that encourages the active engagement of diverse participants, including

financial institutions, regulatory bodies, technology providers, stakeholders, and other relevant entities in collaborative experimentation. This structured and cooperative approach, defined and adopted by stakeholders within the financial ecosystem, aims to jointly explore, test, implement, and incrementally improve innovative solutions and methodologies related to data collection and utilization.

This approach should encourage and enable the exploration of new methods and technologies, facilitating the identification of optimal and efficient solutions, refined through the collective intelligence of the ecosystem, and anchored on novelty, efficiency, and cost-effective gains, in alignment with the recommendations included in GP 2 above.

ADVOCATING INCREMENTAL IMPROVEMENTS

Furthermore, to ensure that industry and stakeholders are prepared to support and contribute to the implementation success of the transformation plan, regulators and policymakers must cultivate a culture of continuous improvement, where all stakeholders actively seek and implement small, iterative enhancements to the data collection and utilization processes.

Figure 16 offers high-level guidance to policymakers in advancing advocacy for incremental improvements, contributing to the collective success of their data transformational plan.

FIGURE 16. GUIDING PRINCIPLES FOR A PRAGMATIC AND ITERATIVE APPROACH

1 ADD VALUE
- ✓ Define at the outset the scope or frame of reference to establish metrics to measure delivery and value
- ✓ Encourage incremental improvements to the use cases, data definitions, processes, standards, engagements, and systems across the transformation lifecycle
- ✓ Proactively assess the transformation plan and activities to ensure net positive value to all stakeholders

2 FOCUS ON USE CASES
- ✓ Be conscious and responsive to legacy and other constraints in the determination of relevant use cases that deliver tangible change
- ✓ Consistently identify and describe what data to collect and for what purpose or objectives
- ✓ Align with industry and other stakeholders to determine effective, resource-friendly standards, initiatives, and process for data collection

3 EXTENSIVE ENGAGEMENT
- ✓ Engage in an intentional and intensive process with internal and external stakeholders
- ✓ Be purposeful about understanding underlying issues and assess possible solutions with the industry
- ✓ Proactively seek and consider feedback and insights from industry and stakeholders

3.4 PILLAR 4: CARRY OUT A RESPONSIBLE AND EFFICIENT DATA POLICY ROADMAP

Coordinating the necessary actions to overcome broad intervention inertia while gaining momentum to galvanize industry and stakeholders to support the delivery of a dynamic, cost-effective, and efficient data policy roadmap is the focus of this pillar.

The success of the financial ecosystem's data collection and policy roadmap usage relies on the coordinated efforts of all stakeholders and the coordination and leadership of the regulator or policymaker.

By embracing an integrated approach focused on responsibility, efficiency, legal mandate, security, scale, and standards, the ecosystem can navigate the complexities of data transformation, while building a foundation for responsible and sustainable data collection and exchange practices, in alignment with the recommendations included in GP 3 above.
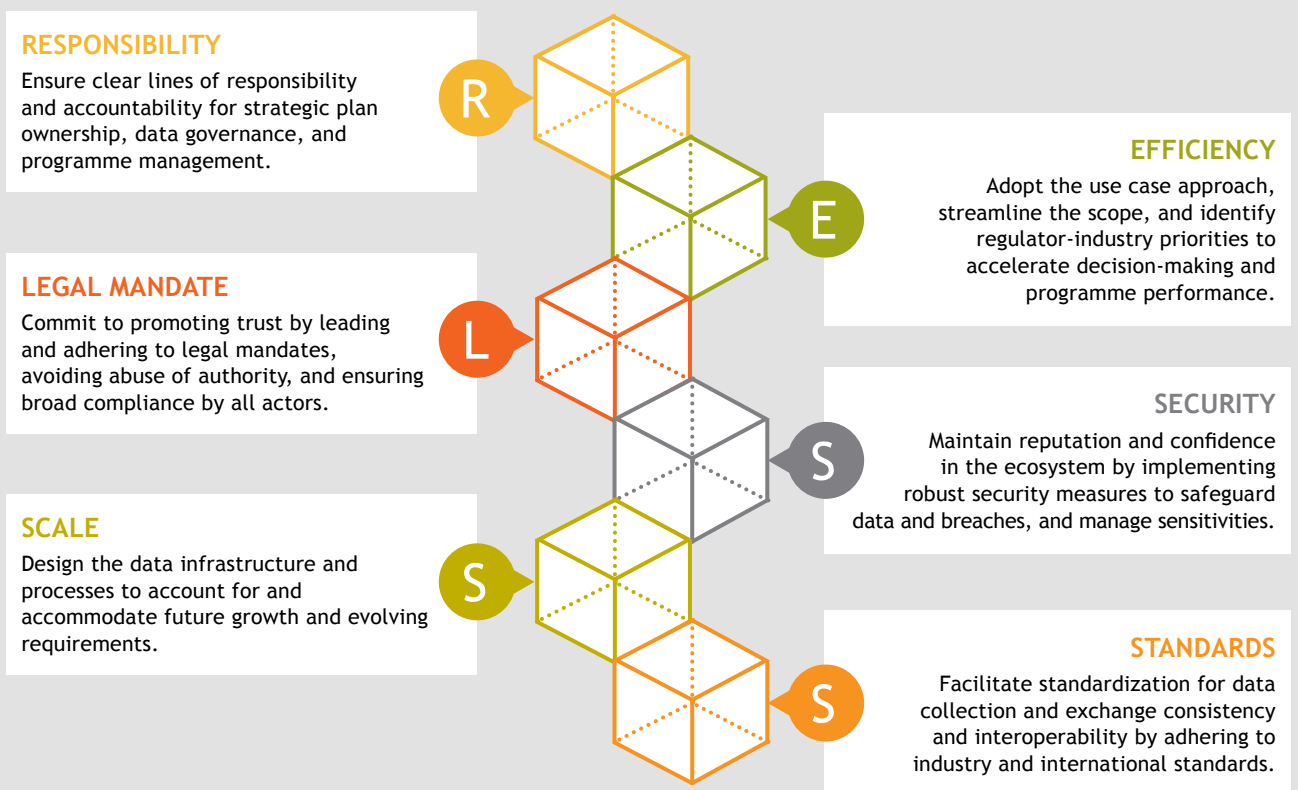
Positioned within the engagement zone, the responsible coordination of actions ensures that each component of the policy roadmap contributes to the overarching vision and goals, ultimately contributing an integrated implementation approach to the data policy roadmap.

INTEGRATED IMPLEMENTATION APPROACH – THE CASE FOR INCLUSIVE DIGITAL INFRASTRUCTURE AND SHARED UTILITIES

Alliance for Financial Inclusion (AFI) member institutions, as documented in the Sochi Accord on Inclusive FinTech, recognize that innovations can enhance financial inclusion by expanding financial access "at scale" and improving the affordability and quality of digital financial services through "efficiency". Such efficiencies can be attributed to the quality, timely access, use, and application of insights and intelligence derived from ecosystem data.

Given the complexity and mix of challenges to executing an integrated implementation approach to a data policy roadmap in any jurisdiction, inclusive innovation defined by the AFI network "as promoting and supporting responsible digital solutions and technological

FIGURE 17. GUIDING PRINCIPLES FOR A PRAGMATIC AND ITERATIVE APPROACH

RESPONSIBILITY
Ensure clear lines of responsibility and accountability for strategic plan ownership, data governance, and programme management.

EFFICIENCY
Adopt the use case approach, streamline the scope, and identify regulator-industry priorities to accelerate decision-making and programme performance.

LEGAL MANDATE
Commit to promoting trust by leading and adhering to legal mandates, avoiding abuse of authority, and ensuring broad compliance by all actors.

SECURITY
Maintain reputation and confidence in the ecosystem by implementing robust security measures to safeguard data and breaches, and manage sensitivities.

SCALE
Design the data infrastructure and processes to account for and accommodate future growth and evolving requirements.

STANDARDS
Facilitate standardization for data collection and exchange consistency and interoperability by adhering to industry and international standards.

approaches, to enhance financial inclusion, while considering the specific needs and circumstances of unserved and underserved populations, ensuring equitable access, meaningful usage, and affordability of financial services for all" could be the key.

Therefore, inclusive digital infrastructure and shared utilities (a form of digital public goods) could be the vehicle to driving the low-cost adoption of platforms, addressing the complexities of legacy, planning, resources, the balance between derived value and cost, and access to curate data sources. They also facilitate the reconciliation of standards, security data privacy and protection, accountability and much more, all of which are needed to develop and implement smart policies leveraging data.

AFI defines Inclusive Digital Infrastructure and Shared Utilities as "shared digital systems, platforms, or technologies, founded on collective principles and policies, that support equal and equitable access, use, delivery, and management of digital services and data flow to all members of an ecosystem or community, with the aim of promoting an inclusive, cost- efficient, credible, open, and secure digital technology outcome that benefits all".

Therefore, for jurisdictions seeking to adopt inclusive digital infrastructure as part of their data transformation plans, the commitments outlined in the Victoria Consensus on Advancing Responsible and Inclusive Innovation for Financial Inclusion are relevant and serve as imperative guiding principles worth considering.

BOX 7. EMPOWERING DIGITAL ECONOMIES: THE ROLE OF DATA EXCHANGES

In a groundbreaking collaboration, the Central Bank of Kenya (CBK) joined forces with the Monetary Authority of Singapore, and the central banks of Ghana, Cambodia, and Brunei to launch the Foundational Digital Infrastructure Report in 2021. This initiative, a result of the FinTech Cooperation Agreement signed by CBK and MAS during the Afro-Asia FinTech Festival, aims to develop essential digital infrastructure services for Kenya.

A core aspect of this initiative is data exchange, which allows end-users to share their data with service providers for specific purposes and durations. By enabling financial planning, simplifying tax filings, supporting loan applications, and facilitating secure payments, data exchanges foster an ecosystem where authenticated information drives seamless transactions. The data shared can encompass diverse aspects like loan details, transactions, demographics, and asset holdings, necessitating robust technical components and governance frameworks.

DESIGN AND REQUIREMENTS

For data exchanges to thrive within a local digital economy, several crucial design considerations and requirements must be addressed. This includes stringent security measures to ensure both flexibility and safety in data exchange. Privacy requirements are paramount, ensuring transparent communication with users about data usage, obtaining consent, and providing mechanisms for consent revocation. Technical standards and authentication protocols guarantee interoperability, protect against fraudulent access, and limit the sharing of sensitive information. Additionally, incentives are essential to encourage data suppliers, such as financial institutions, to readily provide accessible and timely data. Equitable data access for individuals and small businesses, coupled with a level playing field for all ecosystem participants, encourages competition and innovation.

ENABLING CAPABILITIES

The capabilities driving successful data exchanges encompass APIs and similar data transfer functionalities, enabling seamless exchange among data providers, intermediaries, and end-users. Robust authentication mechanisms ensure secure user verification, while standard-setting bodies play a pivotal role in establishing uniform standards across the industry. Furthermore, efficient data governance and management capabilities transform raw data into actionable insights, supporting analyses crucial for fraud prevention and enhancing overall system resilience. This collaborative effort underscores the pivotal role of secure and transparent data exchanges in driving digital economies forward.

Source: Central Bank of Kenya. Available at: https://www.centralbank.go.ke/2021/04/30/foundational-digital-infrastructure- report/

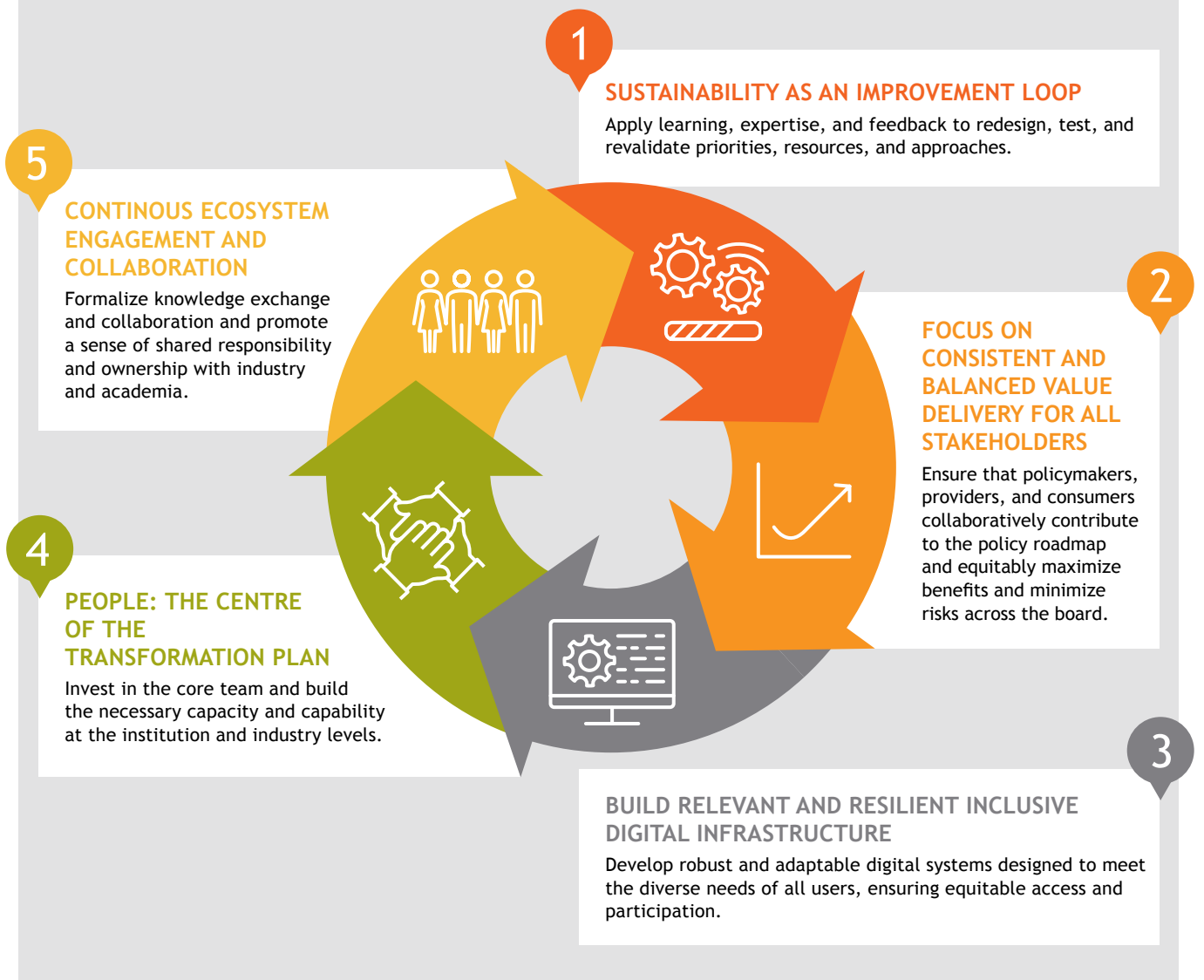## 3.5 PILLAR 5: ESTABLISH AND REINFORCE A SUSTAINABILITY LOOP

The establishment and reinforcement of a sustainability loop centered on people and digital infrastructure are foundational to the success of the data policy roadmap.

In the pursuit of transforming data collection and use for the financial sector, establishing and reinforcing a sustainability loop that prioritizes both people and digital infrastructure is crucial, in alignment with the recommendations included in GP 3.5 above.

This pillar outlines some foundational principles (see **Figure 18**) and recommendations for building and sustaining a resilient ecosystem-driven data collection and analytics framework, which can improve supervision, oversight, intelligence, and decision-making outcomes, anchored on the capabilities and capacities of people (financial regulator and industry) and the robustness of the identified and adopted digital infrastructure.

Regularly measuring the impact of these guiding principles within the data collection strategy or transformational plan ensures that the financial ecosystem remains adaptive, responsible, and resilient in the face of evolving challenges and opportunities.

FIGURE 18. SUSTAINABILITY LOOP FOR AN ECOSYSTEM-DRIVEN DATA POLICY ROADMAP

1 SUSTAINABILITY AS AN IMPROVEMENT LOOP
Apply learning, expertise, and feedback to redesign, test, and revalidate priorities, resources, and approaches.

2 FOCUS ON CONSISTENT AND BALANCED VALUE DELIVERY FOR ALL STAKEHOLDERS
Ensure that policymakers, providers, and consumers collaboratively contribute to the policy roadmap and equitably maximize benefits and minimize risks across the board.

3 BUILD RELEVANT AND RESILIENT INCLUSIVE DIGITAL INFRASTRUCTURE
Develop robust and adaptable digital systems designed to meet the diverse needs of all users, ensuring equitable access and participation.

4 PEOPLE: THE CENTRE OF THE TRANSFORMATION PLAN
Invest in the core team and build the necessary capacity and capability at the institution and industry levels.

5 CONTINOUS ECOSYSTEM ENGAGEMENT AND COLLABORATION
Formalize knowledge exchange and collaboration and promote a sense of shared responsibility and ownership with industry and academia.

SECTION IV: CONCLUSION

This Guideline Note proposes a strategic course for building an ecosystem-driven data policy roadmap aimed at enhancing market intelligence, oversight, and decision-making within the financial sector.

The outlined guiding principles and recommendations in this document aligns with the overarching SPACE framework ensuring a systematic approach to change management at both the regulator and industry levels.

In concluding this Guideline Note, it is crucial to recognize that the successful implementation of a long-term, ecosystem-driven data policy roadmap, grounded in the SPACE framework, necessitates a collaborative approach that leverages the collective strengths and insights of diverse stakeholders, including banks, non-banks, FinTechs, BigTechs, FinTech associations, and regulatory bodies.

By supporting a collaborative environment, central banks, financial regulators, and supervisors can facilitate a transformative journey towards a data-rich, insight-driven, and inclusive financial ecosystem.

To advance the adoption of the SPACE framework, the guiding principles it presents, and the recommendations towards developing a policy roadmap, AFI and its network of financial regulators, central banks, and supervisors should explore the following as an indicative actionable implementation plan:

1 | STAKEHOLDER ENGAGEMENT

Given that the policy roadmap is anchored within the DFS and FinTech ecosystem, one of the immediate actions should be to promote collaborative relationships with all ecosystem stakeholders ensuring the policy roadmap aligns with the needs and capabilities of each group, including banks, non-banks, FinTechs, BigTechs, FinTech associations, and other regulatory bodies.

This can be facilitated by organizing multi-stakeholder forums and roundtable discussions and establishing continuous feedback mechanisms for inclusive policy development.

2 | FINTECH AND DFS ECOSYSTEM DIAGNOSTICS AND LANDSCAPE ASSESSMENTS

Another important step on the journey towards inclusive ecosystem-driven data collection and usage is for financial regulators and supervisors to conduct thorough diagnostics and assessments to clearly understand the current state and potential of the DFS and FinTech landscape, support the development of their national FinTech and DFS ecosystem taxonomy, and identify opportunities and gaps for data collection and use.

This action could be pursued by commissioning ecosystem mapping studies and sector- specific research to develop a jurisdiction specific taxonomy and develop a comprehensive database of FinTech initiatives and service providers.

3 | ECOSYSTEM DATA POLICY DEVELOPMENT AND REVIEWS

Financial regulators and supervisors within the AFI network could leverage the Digital Financial Services Working Group (DFSWG) platform as they embark on the development of their policy roadmap. DFSWG can provide strategic support and direction for the creation and periodic review of data policies, ensuring they are robust, current, and supportive of the overarching goals of financial inclusion and ecosystem growth.

Furthermore, through the Working Group (WG) platform at AFI, workshops and technical sessions on developing this policy document can be explored with opportunities for further support from constructive peer reviews and benchmarking with best practices.

4 | CAPACITY AND CAPABILITY BUILDING EFFORTS

Building the capacity and capability of all stakeholders is critical to achieve an inclusive and collaborative ecosystem-wide data regime. It is important to improve the knowledge and skills of ecosystem participants, allowing them to effectively engage with, participate in, and contribute to the FinTech and DFS ecosystem data regime from a range of perspectives, including policy, technology, technical models, data security, and analysis.

Hosting regular training sessions, webinars, and workshops should be encouraged. Additionally, developing case studies on regulatory best practices can provide regulators with deeper insights into implementing their own policy roadmaps.

5 | CHOICE AND DEVELOPMENT OF TECHNOLOGY INFRASTRUCTURE AND DIGITAL PLATFORMS

The potential value of leveraging responsible and inclusive innovation emerges as a central theme. Treating innovation as a digital public good allows the development of sustainable, inclusive, and ethically sound solutions, in alignment with responsible data practices while also positioning the financial ecosystem as a driver of positive societal impacts.

Advising and supporting the development of technological solutions that enable efficient data collection, usage, intelligence generation, sharing, security, and governance should be considered. This can include creating guidelines for selecting and implementing digital platforms, making decisions on standards, or piloting innovative data platforms in collaboration with technology providers and industry participants.

6 | IN-COUNTRY TECHNICAL SUPPORT TOWARDS IMPLEMENTATION

Preparation involves advocating for collective experimentation and incremental improvements. This phase both encourages innovation and positions stakeholders to proactively address legacy challenges while embracing a culture of continuous enhancement that is not resource-constrained.

As AFI member institutions consider developing these inclusive data regimes, providing hands-on technical assistance to countries implementing the data policy roadmap and ensuring alignment with the SPACE framework should be encouraged. This support can include (but is not limited to) deploying expert teams for in-country support and establishing a monitoring and evaluation mechanism for tracking progress and impact.

7 | PEER LEARNING, KNOWLEDGE EXCHANGE, AND POLICY DOCUMENT REVIEWS

Promoting a culture of learning and exchange among peers to share insights, experiences, and best practices across their journeys to developing and implementing an ecosystem driven data regime should remain a key anchor towards amplifying the adoption of this Guideline Note.

Members of the AFI network can leverage the facilitated knowledge exchange programs and policy document peer review platform as they embark on their respective journeys.

FINAL REMARKS

Our recommended actions and tasks, delineated in this Guideline Note, serve as a comprehensive guide to engage stakeholders, conduct diagnostics, support policy evolution, and build capacity.

They underscore the importance of robust technology infrastructure and emphasize the value of in-country technical support, peer learning, and ecosystem-level initiatives. Through these concerted efforts, we aim to establish a resilient, inclusive digital infrastructure that not only addresses current needs, but is also adaptable to future challenges and opportunities.

The path laid out is not without its obstacles, however, these complexities can be navigated by anticipating and mitigating potential barriers, embracing change management principles, and continuously refining based on feedback. This proactive and inclusive approach ensures that the roadmap remains relevant, actionable, and aligned with the mission to harness FinTech and DFS for broader financial inclusion, effective policy action, and comprehensive supervision.

In closing, the SPACE framework represents more than just a policy roadmap; it is a call to action for collective experimentation, responsible and efficient implementation, and the establishment of a sustainability loop that reinforces the vision for an integrated, inclusive, and prosperous financial ecosystem achieved by responsibly leveraging data.

CONCEPTS AND DEFINITIONS[25]

BIG DATA	High-volume, high-velocity and/or high-variety information that demands cost effective, innovative forms of information processing that enable insight, decision-making, and process automation. The big data movement, having emerged from analytics as a research discipline, seeks to extract intelligence from data and translate it into business advantages. (AFI's Dictionary)
BIGTECH	Large technology conglomerates with extensive customer networks and core businesses in social media, telecommunications, internet search, and e-commerce. The business model of BigTech is based on three factors: the data they already have on consumers, assisting BigTechs to better understand customer needs; the advanced analytics they use to deepen this understanding further; and the reliance on strong networks to leverage their large consumer base. (AFI's Dictionary)
CENTRAL BANK DIGITAL CURRENCY (CBDC)	The CBDC is defined by the Bali FinTech Agenda 2018 as "a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank". (This definition is provided by the Bank for International Settlements).
CROWDFUNDING OR ALTERNATIVE FINANCE	A blanket term denoting a subsector of the FinTech industry. It consists of enterprises, namely platforms or originators, using electronic means to match supply from investors or donors with the demand for funds, represented by promoters (individuals or enterprises) who have specific projects to be funded. (AFI's Dictionary)
CRYPTOCURRENCY	Cryptocurrency is a form of digital currency that can be traded, transferred, and used for investment or payment. (AFI's Dictionary)
CYBERSECURITY	The practice of safeguarding computer hardware and software (i.e. data, devices, programs, systems, and networks) against damage, failure, and abuse. (AFI's Dictionary)
DATA	Factual information from which statistics are created. (AFI's Dictionary)
DATA COLLECTION MECHANISM	Is the combination of the systems and procedures used to compile, transform, validate, and report data (by the side of the reporting institution), and the systems and procedures used to collect, validate, store, manage, and access the data (by the side of the supervisor). The higher the desired level of granularity, frequency, and scope, the greater the need to consider reforms in the data collection mechanism. (CGAP 2017)
DEMAND-SIDE DATA ON FINANCIAL INCLUSION	Financial inclusion data collected from or concerning a household, individual, or small business. Individual-level surveys are necessary to collect data on the demographic characteristics of financial services users to identify segments of the population with the most significant barriers to access to finance, including women, rural residents, and the poor. (AFI's Dictionary)
DIGITAL BANK	A regulated financial institution that delivers a wide range of banking products and services, primarily through virtual means. (AFI's Dictionary)
DIGITAL CHANNELS	A range of digital systems, including the internet, mobile phones, ATMs, POS terminals, and electronically enabled cards. (AFI's Dictionary)
DIGITAL CURRENCY	Assets whose value is determined by supply and demand akin to commodities like gold. However, in contrast to commodities, they have no intrinsic value. Unlike traditional E-Money, they are not backed by any individual or organization. The value of digital currencies depends on the notion that they can be exchanged for commodities, services, or sovereign or fiat currency in the future. (This definition is provided by the Bank of International Settlements).
DIGITAL DATA	Non-physical data generated as a by-product of everyday interactions with digital products or services; it is characterized by its large volume, variety, lack of structure, and high rate of generation. (AFI's Dictionary)
DIGITAL FINANCIAL CAP ABILITY	An individual's competencies in financial knowledge, skills, and behaviors needed to undertake informed, confident, and relevant decisions and actions about personal and household finances to improve one's financial well-being and to apply those competencies in a digital environment. (AFI's Dictionary)

[25] The concepts and definitions primarily stem from "WORDS MATTER: AFI's Financial Inclusion Dictionary" and other AFI Documents, available at: https://www.afi-global.org/publications/words-matter-afis-financial-inclusion-dictionary/ Additionally, internationally recognized concepts and definitions are incorporated to explain other terms.

DIGITAL FINANCIAL INCLUSION	The use and promotion of digital financial services (DFS) to advance financial inclusion. (AFI's Dictionary)
DIGITAL FINANCIAL INFRASTRUCTURE	The availability of mobile communication devices – ideally smartphones supported by broadband internet, although this is by no means necessary. (AFI's Dictionary)
DIGITAL FINANCIAL SERVICE (DFS) PROVIDER	A financial institution that uses technology/mobile phones to access financial services and execute financial transactions. (AFI's Dictionary)
DIGITAL FINANCIAL SERVICES (DFS)	The broad range of financial services accessed and delivered through digital channels, including payments, credit, savings, remittances, and insurance. The DFS concept includes mobile financial services (MFS). (AFI's Dictionary)
DIGITAL WALLET	An electronic service on either a mobile device or online that holds assets (funds, tokens, vouchers, or cryptocurrencies) on behalf of a user. The same device or system often allows individuals to make electronic transactions.
DISTRIBUTED LEDGER TECHNOLOGY	The use of independent computers (referred to as nodes) to record, share, and synchronize transactions in their respective electronic ledgers (instead of keeping data centralized as in a traditional ledger). Blockchain organizes data into blocks, which are chained in an append-only mode. Blockchain is one type of distributed ledger. (AFI's Dictionary)
ELECTRONIC DATA WAREHOUSE (EDW)	A system that saves data in a defined manner. Data is typically only loaded into the warehouse when an application for the data has been determined. The data structure and schema are established beforehand to optimize quick SQL queries. (AFI's Dictionary)
ELECTRONIC MONEY ISSUER (EMI)	The entity that initially issues E-Money against receipt of funds. Some countries only permit banks to issue E-Money (see Bank-based and Bank-led Models), while others permit non-banks to issue E-Money (see Non-bank-based and Non- bank-led Models). (AFI's Dictionary)
EQUITY CROWDFUNDING	Raising capital online directly from the public through the sale of equity in a private enterprise (company) without the involvement of a stock exchange. The terms of the transactions, as determined by the enterprise/ entrepreneur raising the funds, are published online.
FINANCIAL SERVICE PROVIDER (FSP)	A financial institution that provides access to financial services like credit, savings, remittances, and insurance using either manual delivery or digital channels. (AFI's Dictionary)
FINANCIAL TECHNOLOGY (FINTECH)	The use of technology and innovative business models in the provision of financial services. The term is a contraction of "Financial Technology". It refers mainly to technological innovations in the financial sector, including innovations in financial literacy and education, retail banking, investment, and even cryptocurrencies. (AFI's Dictionary)
FINANCIALLY EXCLUDED (FORMALLY)	A term describing individuals and or businesses who do not have access to traditional and formal financial services and products such as savings, credit, insurance, and payment services. Instead, they may use informal products and services or a mix of formal and informal services depending on their needs and the services available and accessible to them. (AFI's Dictionary)
FORMAL FINANCIAL SERVICE PROVIDERS	Institutions that have government recognition for providing financial services; these are mostly but not necessarily regulated. Types of formal providers of financial services include commercial banks, state banks, rural/agricultural banks, savings banks, and non-bank financial institutions. Other financial service providers like microfinance NGOs and credit unions are also often considered to be formal though they are not always regulated. (AFI's Dictionary)
GENDER STATISTICS	A combination of: a) data collected and presented by sex as a primary and overall classification; b) data that reflects gender issues; c) data based on concepts and definitions that reflect the diversity of women and men and capture all aspects of their lives; d) data that take into account stereotypes and social and cultural factors that may induce gender bias. (This definition is provided by Data2X)
GRANULARITY	The level of detail in a particular data set. Thus, if data can be subdivided by groupings such as sex, geographic region, income level, education, disability status, and so on, it increases the level of granularity. (AFI's Dictionary)
INCLUSIVE DIGITAL INFRASTRUCTURE AND UTILITES	Shared digital systems, platforms or technologies, founded on collective principles and policies, that support equal and equitable access, use, delivery, and management of digital services and data flow to all members of an ecosystem or community, with the aim of promoting an inclusive, cost-efficient, credible, open, and secure digital technology benefits for all. (AFI's Dictionary)
INDEX	The compilation and combination of individual indicators; ideal for measuring multidimensional concepts. For example, an index of women's empowerment or gender inequality across the globe. (AFI's Dictionary)

INDICATOR	Measurement or gauge of events documented in data, including the scale on which the event is measured (number, percent, or ratio). An indicator allows for meaningful comparisons of positive and negative change. (This definition is provided by Data2X)
INNOVATION HUB	A common cross-functional space that creates a haven for new ideas. With opportunities for individual and group collaboration across time zones and continents, it's a place that fosters a culture of innovation through the creation, sharing, and testing of ideas. (AFI's Dictionary)
INSURTECH	An insurance company, intermediary, or insurance value chain segment specialist that utilizes technology to either compete or provide valued-added benefits to the insurance industry. (AFI's Dictionary)
OPEN DATA	Data that can be freely used, re-used, and redistributed by anyone, subject only to the condition that it is properly attributed and freely shared. (AFI's Dictionary)
PROPORTIONATE FINANCIAL REGULATION	The customization of regulatory requirements to a firm's size, its importance to the financial system, its complexity and risk profile. It is closely associated with the concept of risk-based supervision. (AFI's Dictionary)
QUALITY of DATA	Those aspects of statistical outputs that reflect their fitness for use by clients. Six dimensions of quality have been posited: relevance, accuracy, timeliness, accessibility, interpretability, and coherence. (AFI's Dictionary)
REGULATORY SANDBOX	An experimental framework set up by a financial sector regulator to allow small-scale, live testing of innovations by private firms in a controlled environment under the regulator's supervision. (AFI's Dictionary)
REGULATORY TECHNOLOGY (REGTECH)	Any technology which can include artificial intelligence (AI), machine learning (ML), data science, and more straightforward technology, such as databases that is used to enhance processes, methods, and tools for regulatory reporting, compliance, and mandated regulatory objectives. (AFI's Dictionary)
RISK-BASED SUPERVISION (RBS)	A forward-looking approach, with a focus on evaluating both present and future risks, identifying emerging challenges, and facilitating prompt intervention and early corrective actions by focusing on the inherent risks of an FSPs business model and product offerings. RBS replaces a compliance-based approach and is expected to become more inclusive, risk-based, and data-centric. (AFI's Dictionary)
SUPERVISORY TECHNOLOGY (SUPTECH)	A subset of RegTech - technologies used by supervisory agencies to enhance the efficiency of processes for the application of regulations. It enables them to digitize reporting and regulatory processes to provide more efficient and proactive monitoring of risk and compliance at financial institutions. (AFI's Dictionary)
SUPPLY-SIDE DATA (ON FINANCIAL INCLUSION)	Data that is collected directly from financial services providers: banks, cooperatives, microfinance institutions, insurance companies, and other types of institutions such as mobile network operators. In general, supply-side data is collected by the regulator and other national authority institutions via reporting, which allows data collection at regular intervals (monthly, quarterly, yearly). This data normally covers the outreach of financial institutions, their financial products and services, and sometimes prices. The information can be captured with different levels of disaggregation according to the administrative division of each country (e.g. districts, departments, etc.). (AFI's Dictionary)

ANNEXURE 1

FIGURE A1. AFI SURVEY ON FINTECH ECOSYSTEM DATA COLLECTION BY MARKET SEGMENTS

Vertical Market Segments	Level 1 Subsegments / Fintech Ecosystem	CCAF - AFI Nr. Fintech Entities %	REGULATORY AUTHORITY RESPONSIBLE FOR DATA COLLECTION _ SURVEY AFI MEMBERS					
			Central Bank	Government Entity	Financial Regulator	Sandbox Regulation	Unregulated but operational	Not applicable
I. DIGITAL FINANCIAL SERVICES / BANKING, PAYMENTS, FINANCIAL AND MARKET SEGMENTS								
Digital Payments	Payment Services	20%	95%			5%		
	Backend Services		90%			5%		
	Crypto Payments		13%		6%		31%	50%
	Stablecoin Issuance		7%		7%	6%	13%	67%
Digital Savings		3%	50%		20%		15%	15%
Digital Lending	Balance Sheet Lending	25%	31%	13%	19%		6%	31%
	P2P/Marketplace Lending		28%		17%	5%	11%	39%
	Debt-Based Securities		24%		24%		5%	47%
Digital Banks	Fully Digitally Native Bank,	5%	56%		10%			34%
	Agent Banking		80%		10%		5%	5%
Capital Raising & Investment	Investment	13%	11%	6%	39%	5%		39%
	Non-Investment Based		6%	6%	19%	12%	13%	44%
Cryptoasset Exchange	Trading	4%		6%	12%		17%	65%
	Intermediation & Brokerage				6%	12%	13%	69%
	Other		6%				24%	70%
Digital Custody	Institutional / Retail Custody	3%	11%				17%	72%
InsurTech		6%	33%		53%			14%
II. TECHNOLOGY AND POLICY ENABLERS OF DIGITAL FINANCIAL SERVICES								
RegTech		2%	53%		12%		12%	23%
Credit Analytics		3%	40%		25%		10%	25%
Digital Identity		2%	11%	63%			10%	16%
Tech. for Enterprise		12%	11%	11%			33%	45%
Consensus Services	Mining	2%	11%	18%			24%	47%

Source: Data analyzed and visualized by consultants based on the CCAF, Global FinTech Ecosystem Atlas, and AFI Survey on FinTech Data for Supervision and Market Intelligence

**FIGURE A2.** THE CAMBRIDGE FINTECH ECOSYSTEM TAXONOMY BASED ON MARKET SEGMENTS AND SUB- SEGMENTS[26]

DIGITAL PAYMENTS	Payment Services/Backend Services/Crypto Payments/Stablecoin Issuance
DIGITAL SAVINGS	Digital Money Market/Funds, Digital/Micro/Collective Savings
DIGITAL LENDING	Balance Sheet Lending/P2P/Marketplace Lending/Debt-Based Securities
DIGITAL BANKS	Fully Digitally Native Bank (Retail/MSME), Marketplace Bank (Retail/MSME), Banking-as-a-Service (BaaS), Agent Banking (Cash-In/Cash-Out)
DIGITAL CAPITAL RAISING	Investment/Non-Investment Based Crowdfunding
CRYPTOASSET EXCHANGE	Trading/Intermediation & Brokerage/Other Financial Transaction Processing
DIGITAL CUSTODY	Institutional/Retail Custody
INSURTECH	Usage/Parametric-Based Insurance, On-Demand/P2P Insurance, IoT, Technical Service Provider (TSP), Digital Brokers or Agents, Comparison Portal, etc.
WEALTH (INVESTMENT) TECH	Asset Management/Personal Financial Services
REGTECH	Profiling & Due Diligence, Blockchain Forensics, Risk Analytics, Dynamic Compliance, Regulatory Reporting, Market Monitoring
ALTERNATIVE CREDIT ANALYTICS	Biometric Analytics, Alternative Credit Rating Agency, Credit Scoring
DIGITAL IDENTITY	Security & Biometrics, KYC Solutions, Fraud Prevention & Risk Management
TECH. FOR ENTERPRISE	API Management, Cloud Computing, AI/ML/NLP, Enterprise Blockchain, Financial Management & Business Intelligence, etc.
INTERNAL AU	Mining/Remote Hosting Services, Cloud Mining, Hashrate Brokerage, Proprietary Hashing, Pool Operation, etc.

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[26] For more information, please visit: https://ccaf.io/atlas/methodology

Figures A3 and A4 illustrate how the AFI Network is positioned compared to the global FinTech landscapes by market segments, based on the number of entities with a concrete digital presence and in operation for at least one year.

As of August 2023, the CCAF Atlas has identified 724 FinTech entities by operational headquarters within AFI member countries, out of a total number of 4,006 FinTech entities listed worldwide.

FIGURE A3. AFI SURVEY ON FINTECH ECOSYSTEM DATA COLLECTION BY MARKET SEGMENTS
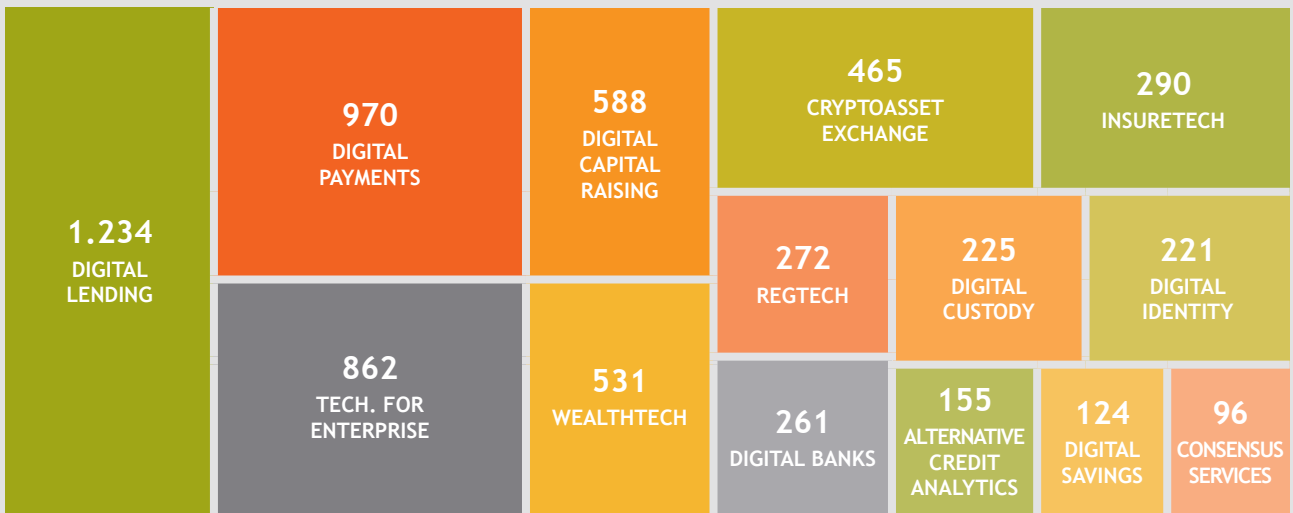
Source: CCAF, Global FinTech Ecosystem Atlas – Data analyzed and visualized by consultants

FIGURE A4. AFI SURVEY ON FINTECH ECOSYSTEM DATA COLLECTION BY MARKET SEGMENTS
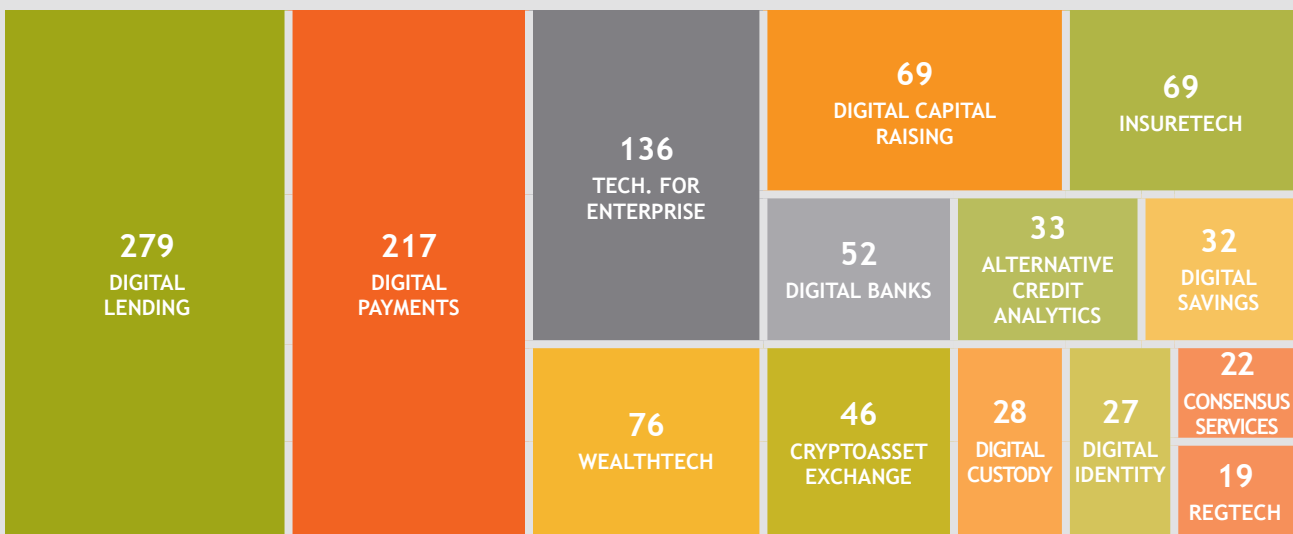
Source: CCAF, Global FinTech Ecosystem Atlas – Data analyzed and visualized by consultants

ANNEXURE 2:

QUESTIONNAIRE ON FINTECH DATA TO AFI MEMBERS

This questionnaire seeks to gather insights into the data collection and usage practices related to FinTech and DFS supervision among AFI members, aiming to facilitate better decision-making and regulation in the rapidly evolving financial landscape. The following is a summary of the responses submitted by 20 AFI members (25 percent of all AFI member countries):

FINTECH/DFS-SPECIFIC STRATEGY AND FINANCIAL INCLUSION STRATEGY:

All respondents accept that data collection on FinTech and DFS is provisioned somehow in their regulative framework, however, most confirm that the approved NFIS or the strategic document covering FinTech/DFS in their jurisdictions have a narrow or no specific focus on data collection for intelligence and ecosystem insights.

FINTECH/DFS TAXONOMY:

Only one in four respondents (26 percent) confirm having a glossary/taxonomy for FinTech and DFS in their jurisdictions.[27] Most AFI members do not have a document to define the FinTech taxonomy in their jurisdiction.

BIG TECH/DIGITAL PLATFORMS IN FINANCIAL SERVICES:

Most respondents confirm the presence of Big Tech companies operating in the financial services sector in their countries, such as: Meta (45 percent); Amazon, Alibaba, Apple, and Google (35 percent), Microsoft and Uber (30 percent), eBay (20 percent), etc. Regarding the financial services provided by BigTechs, most respondents confirm payments (80 percent), e-money (75 percent), lending (50 percent), insurance (45 percent), personal investments (20 percent), and open banking (10 percent).

ROLE OF FINTECH ASSOCIATIONS:

Most respondents (75 percent) acknowledge having a FinTech Association operating in their country, but less than half (40 percent) confirm that these associations play an active role in collaborating with regulators to collect data on FinTech and DFS activities.

DATA COLLECTION APPROACHES:

Most respondents confirm having either a specific regulation (67 percent) or an existing regulatory framework (58 percent) mandating DFS service providers to submit data regarding their activity. Only 32 percent are leveraging data from regulatory sandbox or innovation hubs related to FinTech innovation startups.

DATA COLLECTION FOR POLICY OBJECTIVES:

Most respondents confirm to gather data and to monitor the FinTech activity within their jurisdiction for various objectives, like financial inclusion (90 percent), financial stability and consumer protection, efficiency of payment systems (75 percent), integrity and cybersecurity (60 percent).

MAPPING OF FINTECH AND DFS ECOSYSTEM:

Most respondents (60 percent) claim to not have a data mapping document at the institutional or national level. Only 30 percent confirm having already established a data mapping document in collaboration with other national regulatory authorities.[28]

DATA COLLECTION MECHANISMS:

Most respondents (60 percent) accept the lack of specific initiatives undertaken by their institution to establish a data collection mechanism. Only 20 percent confirm having a data governance[29] policy in place, 25 percent have trained their staff for data driven supervision and have already updated their reporting requirements framework to introduce codified templates. Only six percent confirm having outsourced a RegTech/SupTech provider for data reporting and monitoring of FinTech and DFS (Papua New Guinea).

FINTECH DATA SOURCES:

Most respondents cited the following as main sources for collecting FinTech-related data: reporting requirements from the regulated financial service providers and the supply-side (80 percent); demand- side surveys for FinTech and DFS services (75 percent); market research from industry stakeholders (55 percent); industry/association's reports (50 percent); and market research from their own institutions (40 percent).

ADDRESSING AND MONITORING FINTECH EMERGING RISKS:

Most respondents are directly involved in monitoring risks emerging from FinTech and DFS activities in their countries through one of the following tools: updating the regulatory framework in place to address emerging risks (55 percent); establishing cybersecurity measures to protect consumers and organizing consumer protection campaigns (50 percent); conducting regular risk assessments for DFS activities with a significant market presence (35 percent); and conducting regular risk assessments for each FinTech and DFS activity (25 percent). Only 20 percent of respondents confirm that they do not conduct risk assessments themselves but rely on third-party risk assessment reports by industry stakeholders.

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27 Bhutan, El Salvador, Eswatini, Jordan, Nigeria, and Haiti.

28 Ecuador, Nigeria, Zambia, El Salvador, Rwanda, and the Dominican Republic.

29 Papua New Guinea, Nigeria, Uganda, and Zambia.

ANNEXURE 3:

POSSIBLE RELEVANT STRUCTURED AND UNSTRUCTURED DATA TO BE COLLECTED BY FINTECH AND DFS PROVIDERS

QUANTITATIVE DATA

FINTECH ACTIVITIES	DIGITAL PAYMENTS	DIGITAL BANKING	DIGITAL LENDING	DIGITAL CAPITAL RAISING	DIGITAL SAVINGS	ASSET MANAGEMENT	INSURTECH SERVICES	CENTRAL BANK DIGITAL CURRENCIES	CRYPTOCURRENCY
OPERATIONAL DATA									
Number of clients/subscribers Number of active/dormant clients Number of clients by type (individual/legal person) Number of clients by gender Number of clients by age Number of ATMs Number of POSs Number of transaction accounts Number of mobile wallets Number of cryptocurrency wallets Number of tokens Number of agents/outlets (if applicable) Number of branches									
SUPERVISORY DATA									
Volume of transactions * Payments Money Transfers Withdrawal E-money issuance Savings Loans Crypto payments (by type of cryptocurrency) P2P loans Securities related transactions Insurance related transactions Other Value of transactions * Payments Money Transfers Withdrawal E-money issuance Savings Loans Crypto payments (by type of cryptocurrency) P2P loans Securities related transactions Insurance related transactions Other Number of overseas transactions per month Value of overseas transactions per month Value of assets in the balance sheet Value of liabilitites in the balance sheet Value of equity in the balance sheet Profit or Loss generated Capital adequacy ratio (if applicable) Liqudity Ratio (if applicable) Non performing loans ratio Value of deposits covered by National Insurance Agency Number of incidents happened in a month Amount of loss related to incidents happended in a month Number of cyber threats Amount of loss related to cyber threats happended in a month How many penetration tests have you performed in a year? *could be subject to threshold									

QUALITATIVE DATA

FINTECH ACTIVITIES	DIGITAL PAYMENTS	DIGITAL BANKING	DIGITAL LENDING	DIGITAL CAPITAL RAISING	DIGITAL SAVINGS	ASSET MANAGEMENT	INSURTECH SERVICES	CENTRAL BANK DIGITAL CURRENCIES	CRYPTOCURRENCY
SPECIFY THE TYPE OF REPORTING									
Regulatory Voluntary									
SUPERVISORY DATA									
SPECIFY THE REGULATORY AUTHORITY, IF NOT THE CENTRAL BANK									
TYPE OF TECHNOLOGY USED									
Blockchain DLT (other than blockchain) Traditional Other									
ESG CAPABILITIES?									
Climate change Decarbonization Circular economy									
GEOGRAPHICAL DISTRIBUTION									
Domestic Regional Intercontinental									
CURRENCY OF TRANSACTIONS									
Domestic currency USD EUR CNY Other									
TYPES OF CRYPTOCURRENCIES ISSUED									
Bitcoin Etherum Tether BNB XRP Dogecoin Other									
WHAT TYPE OF STREASS TESTS DO YOU PERFORM									
Credit risk related Liqudiity risk related Capital adequacy risk related									
LIST OF SHAREHOLDERS									

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ACRONYMS

ADKAR	Awareness, Desire, Knowledge, Ability and Reinforcement
AI	Artificial Intelligence
AML/CFT	Anti-Money Laundering/Counter-Terrorism Financing
API	Application Programming Interface
CCAF	Cambridge Centre for Alternative Finance
CPC	Central Product Classification
DLT	Distributed Ledger Technology
DBT	Direct Benefit Transfer
DFS	Digital Financial Services
DFSWG	Digital Financial Services Working Group
EDMEs	Emerging and Developing Market Economies
FinTech	Financial Technology
FSB	Financial Stability Board
FSP	Financial Service Provider
GN	Guideline Note
GPs	Guiding Principles
IT	Information Technology
ISIC	International Standard Industrial Classification of All Economic Activities
KIIs	Key Informant Interviews
ML	Machine Learning
SaaS	Software-as-a-Service