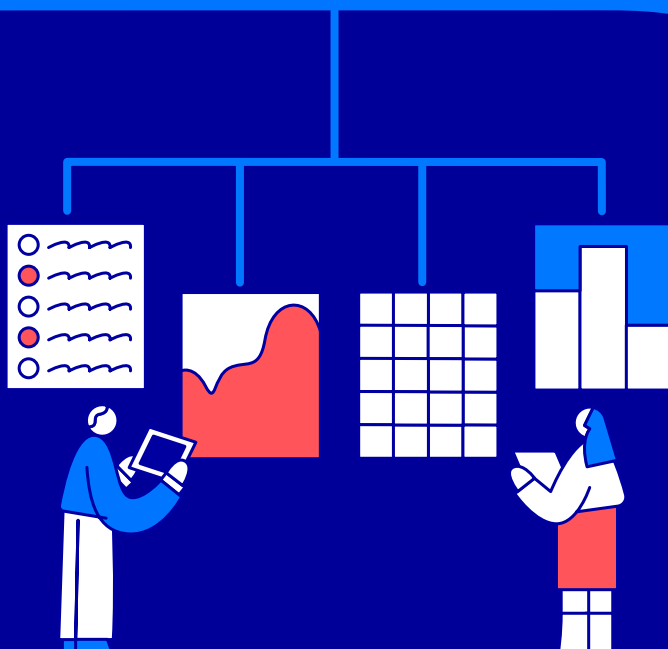# Decision Trees
for Designing and Implementing a Remittance Reporting and Analysis System (RRAS)

Better Remittances Data for Better Decisions

Enabling Policy and Regulations

April 2023

ACKNOWLEDGMENTS

CONTENTS

ABOUT THE DECISION TREES

This decision trees booklet serves as a practical how-to guide for project managers in central banks and regulatory bodies to visualize the decision-making process by mapping out different courses of action whilst designing and building a **Remittance Reporting and Analysis System (RRAS)**.

The decision trees are designed to provide a simple introduction to the key factors in making a decision. The booklet is designed to be used only in conjunction with the accompanying UNCDF implementation reference guide, *Design and Implement a Remittance Reporting and Analysis System (RRAS)*, which provides a detailed comparison of the advantages, challenges, and risks of each approach.

Each central bank likely has different priorities and constraints regarding budget, human capacity, timeframe, or political pressure to generate insights to drive policy and inform product design. There is no 'correct' approach; the most suitable option will be defined by availability, viability, and alignment with the priorities and restrictions of the central bank.

The components of the decision tree framework guides project plans, identifies areas for action, and recommends the next steps.

The accompanying decision trees follow simple **YES or NO pathways**. The arrows guide to the next question as determined by the 'YES' or 'NO' responses to **help you assess different actions** until they reach the end.

FREQUENTLY ASKED QUESTIONS

1. How are central banks capturing remittances for BOP collection purposes?

The typical way to capture remittances for BOP collection purposes is via the International Transaction Reporting System (ITRS).

2. What is a Remittance Reporting and Analysis System (RRAS)?

An RRAS is a system designed to collect, manage, and analyse transaction-level data on international remittances.

3. Do I need an RRAS?

For central banks to drive the development of the financial sector through their data, they need reporting systems and related tools that will support diverse (internal and external) users with unique reporting and analysis needs.

An ITRS is a transaction-level reporting system that captures each transaction as a single record in the system's database. Each transaction above the threshold is reported in a record containing some fields covering all of the detailed requirements. However, remittance transactions often fall below the reporting threshold value (a value that varies by country) and are often reported in highly aggregated formats. Aggregated statistics are compiled only from data submitted by domestic banks, which in most cases are central bank authorities or regulators. This means that as more remittance services are provided through fintechs, mobile money and other digital platforms, central banks using only data from commercial banks will an ever narrower and less complete picture of the market on which to base important policy decisions.

4. What is a transaction in the balance of payments statistics versus in remittances?

A transaction is defined in the IMF BOP manual as an economic flow that reflects the creation, transformation, exchange, transfer, or extinction of economic value and involves changes in ownership of goods and/or financial assets, the provision of services, or the provision of labour and capital.

For the purpose of this booklet, transaction-level remittance data means every transfer has an individual record or entry in a database, the equivalent of a single row in a spreadsheet.

Transaction data is data expected to be present within the transfer instruction. This information would include the date, country of origin and destination, entity type (i.e., bank or money transfer operator), the transfer currency, and the transfer value.

5. What is Supplemental data?

Supplemental data are data that would not generally be in the transfer instruction. This information could include data on sex or location, or the purpose of remittance.

6. What do we mean by aggregated remittance data?

Aggregated data involves volumes and values of transactions aggregated by one or more attributes. For example, if the value of remittances is reported and summarized by the country of origin or by the channel (i.e., bank or money transfer operator). This process would provide a central bank with the ability to analyse the data either by country or by channel but not both.

7. Why is it important to capture and analyse transactional remittance data?

An RRAS aims to generate insights to inform policy and provide data for remittance service providers to identify gaps in the market to promote investment and develop appropriate, affordable, gender-smart remittance products.

8. What is an ITRS?

A data collection system that obtains data from banks and companies at the level of individual transactions. It represents a formal channel containing resident-nonresident transactions routed through the banking system.

The main advantages of an ITRS are its simplicity, low cost, and timeliness, as well as accuracy (especially for the ITRS without a threshold).

It should be noted that in most cases, this system was designed and kept in countries with some level of foreign exchange controls.

WHAT DOES THE DECISION TREE FRAMEWORK FOR REMITTANCES REPORTING AND ANALYSIS DATA SYSTEMS LOOK LIKE?

PURPOSE AND VISION

- Do I need a Remittance Reporting and Analysis System? (decision tree 1)

- Exploration of Concept and Use Case Development (decision tree 2)

PLANNING AND RESOURCES

- Resource Mapping: Understanding Policies and Processes (decision tree 3)

SYSTEM SCOPE AND DESIGN

- Exploit an existing system or Develop a Purpose-Built Remittance Reporting and Analysis System (decision tree 4)

- Custom Development or Turnkey Supervisory Technology Solutions (decision tree 5)

Purpose and Vision

Do I need a Remittance Reporting and Analysis System?

Central banks have designed various methods and tools to understand remittance markets and capture and monitor remittance flows in their countries.

Technological advances have significantly reduced the cost of building or upgrading systems, enabling large amounts of data to be stored, accessed, and configured to meet specific reporting requirements, while also reducing the burden on reporting institutions and the margin for human error. This presents the opportunity for central banks and financial regulators to shift from aggregated data reporting to transaction-level data reporting.

Each central bank likely has different priorities and constraints regarding budget, human capacity, timeframe, or political pressure to generate insights to drive policy and inform product design. There is no 'correct' approach; the most suitable option will be defined by availability, viability, and alignment with the priorities and restrictions of the central bank.

A Remittance Reporting and Analysis System (RRAS) is a system designed to collect, manage, and analyse transaction-level (granular) data on international remittances, including sex-disaggregated data and, ideally, with a location component to facilitate sub-national analysis. Core to RRAS is an analysis module that takes advantage of data visualization to lower barriers to accessing high-quality, detailed insights to drive policy and to inform private sector investment.

Do I need a Remittance Reporting and Analysis System?

Does a significant proportion of the GDP of your country come from international remittances?

NO / **YES**

Do you have issues with informality in the remittance market? Would you like to understand the barriers to formal service use and to generate insights to inform policy to increase formality?

NO / **YES**

Do you have a need for tools to identify and target financially underserved populations in a way that informs policy and product development?

NO / **YES**

Do you understand from where international remittances are received, by whom they are received, how they are used, and their role in the economy?

NO / **YES**

Do you understand the nuanced, gendered dynamics of those sending and receiving remittances and how this could be used to inform policy and product development?

NO / **YES**

Do you need to know more about your remittance market to inform policy decisions on financial stability, monetary policy, financial integrity, financial inclusion, consumer protection, migration education or other policy use cases?

NO / **YES**

Do you think your remittance market will be impacted by new digital payments providers, FinTech or cryptocurrency products?

NO / **YES**

We believe that you could benefit from the design and implementation of the **Remittance Reporting and Analysis System**.

The following decision trees should be used alongside the guide '*Design and Implement a Remittance Reporting and Analysis System*' to collect, manage, and analyse detailed, complete, and accurate data on remittances in order to generate insights to inform policy and product development.

We'd love to hear from you
If you are a central bank and none of the above statements apply to you, we'd love to hear from you to record your experiences and solutions to ensure that your successes and learnings are documented and shared with other regulators.

1. Purpose and Vision

Exploration of Concept and Use Case Development

Do you have existing, defined use cases? What do I need to know to achieve my outcome?

The following decision tree is inspired by the 'proof of concept' method and focuses on developing a deep understanding of user needs and requirements. We call this methodology '**Exploration of Concept**'. Detailed methodology and practical exercises can be found in the UNCDF guide, *Design and Implement a Remittance Reporting and Analysis System (RRAS)*.

A use case describes how a central bank that uses technology will accomplish a goal and achieve the outcome. In this booklet, the use case refers to using technology-enabled systems in remittance reporting, monitoring, management, and analysis for informed policymaking by central banks.

Output

- Idealized, transaction-level dataset
- Prototype data visualizations and dashboards
- Defined use cases for key stakeholders
- Ideal data requirements and standards

The process of defining an ideal dataset and interacting with the data is an important step in encouraging users to think beyond their established use cases. New data attributes, more highly disaggregated reporting structures, and appropriate analysis tools will present opportunities for new use cases and insights.

Once users are open to the potential insights generated from an ideal dataset, they can start defining use cases through the exploration—already begun—of the analysis tools as policymakers, along with new ways the data can be used for supervision, to inform policy, to de-risk, and to inform private-sector investment. Multiple users may have similar use cases, in which case they can be consolidated into a single-use case.

Exploration of Concept and Use Case Development

Do you have existing, defined use cases?

NO **YES**

KEY PARTICIPANTS:
Policymakers, market supervision teams and remittance service providers

QUESTION 1
Do you have existing, defined financial sector use cases?

NO **YES**

QUESTION 2
Do you have existing, defined policy use cases that extend beyond the financial sector (i.e., migration and labour, education, broad economic policy)?

NO **YES**

QUESTION 3
Do you have existing, defined use case, and data needs from service providers?

NO **YES**

Define and create an idealized, transaction level dataset (1)

Visualize the ideal dataset (2)

Present the analysis using dummy data to relevant stakeholders (3)

Develop and prioritize use cases for each potential user group (4)

Define data attributes and standards required to meet use cases

Are these based on ideal, transaction-level dataset or an aggregated dataset based on existing reporting requirements?

NO **YES**

Identify key stakeholders within relevant bodies

OUTPUTS
- Idealized, transaction-level dataset
- Prototype data visualizations and dashboards
- Defined use cases for key stakeholders
- Ideal data requirements and standards

(1) Remember to include all variables that could inform policy or product development using dummy data

(2) You can use a business intelligence tool and analytics platforms

(3) Remember to take account of all stakeholders including financial and non-financial policymakers as well as service providers

(4) Potential User groups:
- Financial supervision and policymaking
- Wider, non-financial policymakers
- Service providers

Planning and Resources

Resources Mapping — Understanding Policies and Processes around Data Capture

Before planning any technical intervention, system design, or build, it is important to take a step back and assess the organizational readiness—in terms of existing policies, processes, and practices—to implement a remittance reporting and analysis system that captures transaction-level or highly disaggregated data.

The following decision tree, in particular, is designed to drive discussion in the following key aspect:

Does the central bank have the legal mandate to capture data from all RSPs regarding international remittances?

In order to carry out their remittances data collection processes and practices effectively, central banks and public authorities will benefit from clear mandates and appropriate legal power.

This decision tree is designed to be used in conjunction with section 'Step 3: Resource Mapping – Understanding Policies and Processes Around Data Capture' found in UNCDF's guide, *Design and Implement a Remittance Reporting and Analysis System (RRAS)*, which provides a more detailed and nuanced exploration of the topic.

Resources Mapping — Understanding Policies and Processes around Data Capture

Does the central bank have the **legal mandate** to capture data from all RSPs regarding international remittances?

YES → Does this mandate cover – or can it be interpreted as covering – the capture of detailed, transaction-level data?

NO → Does another government or institution have a legal mandate to capture this data?

Does this mandate cover – or can it be interpreted as covering – the capture of detailed, transaction-level data?

YES → New reporting templates and requirements will need to be developed for detailed transaction-level reporting

NO → Does policy allow the updating of reporting requirements without change in core regulations?

Does another government or institution have a legal mandate to capture this data?

YES → Does this mandate cover – or can it be interpreted as covering – the capture of detailed, transaction-level data?

NO → Does any institution collect this data on voluntary basis rather than by legal mandate?

Does policy allow the updating of reporting requirements without change in core regulations?
YES / **NO**

Does this mandate cover – or can it be interpreted as covering – the capture of detailed, transaction-level data?
YES

Does any institution collect this data on voluntary basis rather than by legal mandate?
YES / **NO**

Does the data collectors' legal mandate allow for data sharing with the private sector and other policymakers?
NO / **YES**

Is there, or could there be, a data sharing agreement to share detailed data with the central bank?
YES / **NO**

Does the data collectors' legal mandate allow for the sharing of data insights with the private sector and other policymakers?
NO / **YES**

It is likely that the central bank will have to obtain a legal mandate to collect detailed, transaction-level data on remittances from RSPs

It is likely that the central bank will have to obtain a mandate to allow for data sharing with the private sector and other policymakers

CAVEAT: if no legal mandate exists for data sharing, this is likely to limit what insights and data can be shared with other policymakers and service providers. Whilst this need not slow the process of system development, it may be a material barrier to the use cases defined in step 1 and further development work could be complemented by the development of data sharing mandates.

OUTPUT
Legal mandate and data reporting template to collect detailed, transaction-level data on international remittances and to use this data to inform financial and non-financial policy as well as to inform product development by service providers

System Scope and Development

Use an Existing System or Develop a Purpose-built Remittance Reporting and Analysis System

Designing and implementing a new system to capture, manage, and analyse transaction-level data on remittances is likely to require significant financial and human resources, and the temptation to exploit existing systems can be high. However, not all systems are created equal, and in many cases using an existing system could mean significantly compromising data detail, quality, completeness, and timeliness. This guide is designed to be used in conjunction with UNCDF's guide, *Design and Implement a Remittance Reporting and Analysis System (RRAS)*, to provide a simple outline of the key information required to make an informed decision on when and under what circumstances existing systems could be exploited in the development of a Remittance Reporting and Analysis System.

Exploit an Existing System or Develop a Purpose-Built Remittance Reporting and Analysis System

Is there a systematized way* of capturing, aggregating, and managing data on remittances already in place?

YES

NO

What level of aggregation is the data reported at?

Aggregated

Transaction level

Is this system used for the compilation of BoP statistics?

YES

NO

It is unlikely that this system will be suitable for the capture of detailed, transaction-level remittance data

Is there any other system within the institution which collects detailed, transaction-level data from financial service providers?

YES

NO

Was this system developed by an in-house development team?

YES

NO

Do you have the technical skills in-house to update this system to capture regular, detailed, transaction-level data on remittances from service providers in an automated manner?

YES

NO

DEVELOPMENT OF A RRAS

- It is likely that you will have to either develop or purchase a system to capture and analyse detailed, transaction-level data on remittances.

- Your next decision will be whether to develop a custom system, purchase an off-the-shelf product, or use a RegTech/SupTech solution

Is your service provider willing to customize the existing system to also allow to capture regular, detailed, transaction-level data on remittances from service providers in an automated manner?

YES

NO

DOES THE SYSTEM:

- allow for the capture of supplemental data (such as gender, purpose of transfer, and location)?
- provide data validation and quality control processes?
- store data in a manner which allows a connection to business intelligence and data visualization software?
- exploit data analysis options including data visualization/dashboards and direct download of data by authorized users?
- have enough spare data storage capacity to store transaction-level data for remittances for a minimum of the next 5 years?

YES

NO

Do you have the capacity, either in-house or externally, to update the existing system to meet the data collection and analysis requirements defined in step 1?

YES

NO

TECHNICAL REVIEW
It may be possible for you to update an existing system to meet your needs. However, this does not necessarily mean it is the best option. If compromises in functionality mean that the system is not likely to meet your long-term needs, then these funds may be better directed towards developing a new system specifically for this task. (See Step 9: Cost-Benefit vs Cost-Insight)

Congratulations, you have the building blocks for a functional Remittance Reporting and Analysis System.

SYSTEM UPDATE
It appears that your current system has the core functionality of a Remittance Reporting and Analysis System but it requires one or more updates or modules to provide high-quality data and optimal insights.
For detailed requirements for each module, please see the guide, *Design and Implement a Remittance Reporting and Analysis System.*

* This involves institutions reporting data digitally directly to a system without manual aggregation, management or manipulation by central bank staff. It also involves being stored and made accessible in a modern database structure.

System Scope and Development

Custom System Development or Turnkey Supervisory Technology Solution

One of the most important design considerations, especially for regulators with budget constraints and limited human resources, will be whether to develop a system from scratch or to customize existing software and applications. The following decision tree summarizes the 'Custom Development or Turnkey Supervisory Technology Solutions' section of UNCDF's guide, *Design and Implement a Remittance Reporting and Analysis System (RRAS)*. This section assumes that there is no existing system in place that captures, manages, and analyses transaction-level data that could be exploited and extended to serve as a Remittance Reporting and Analysis System.

The decision tree is designed to provide a simple introduction to the key factors in making this decision. It is designed to be used only in conjunction with the accompanying paper, which provides a detailed comparison of the advantages, challenges, and risks of each approach. Each central bank is likely to have different priorities and constraints in terms of budget, human capacity, timeframe, and/or political pressure for the generation of insights to drive policy and inform product design. There is no 'correct' approach. The most suitable option will be defined by availability, viability, and the priorities and restrictions of the central bank.

Definitions

Turnkey Solution is a complete system often including hardware and applications ready for immediate use without significant additional customization or development.

Custom development refers to systems that are built to meet a specific set of needs and requirements. Whilst this may entail using existing applications to carry out individual processes or tasks, the system—as a whole—is developed and customized to order.

Supervisory technology (often abbreviated as SupTech) is the use of innovative technology by supervisory agencies to support supervision. It helps supervisory agencies to digitalize reporting and regulatory processes, resulting in more efficient and proactive monitoring of risk and compliance at financial institutions.
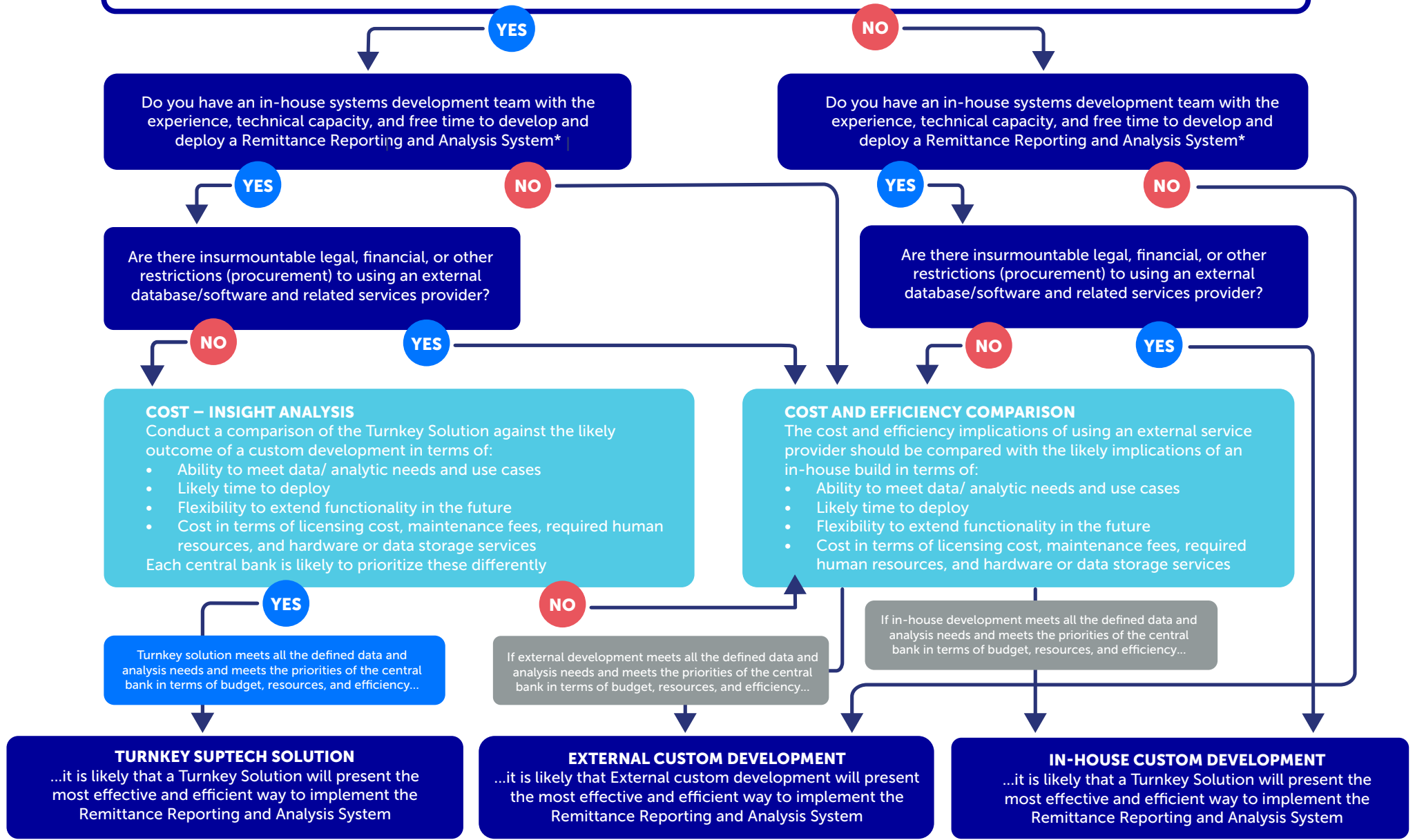*- Bank for International Settlements*

A detailed guide to make this design consideration can be found in Step 4 of the guide, *Design and Implement a Remittance Reporting and Analysis System*.

Custom System Development or Turnkey Supervisory Technology Solution

Does a turnkey solution and service provider exist?
Having defined your use cases, analysis needs, and data requirements, you will need to research technology providers to establish if an off-the-peg solution exists that meets these requirements. Turnkey solutions may offer significant advantages in terms of speed of deployment, level of support updates, and best practices. Turnkey solutions may also offer cost savings over custom development.

Note that in some economic blocs, central banks may share or provide access to data capture systems for reduced or no cost.

YES

NO

Do you have an in-house systems development team with the experience, technical capacity, and free time to develop and deploy a Remittance Reporting and Analysis System*

Do you have an in-house systems development team with the experience, technical capacity, and free time to develop and deploy a Remittance Reporting and Analysis System*

YES **NO**

YES **NO**

Are there insurmountable legal, financial, or other restrictions (procurement) to using an external database/software and related services provider?

Are there insurmountable legal, financial, or other restrictions (procurement) to using an external database/software and related services provider?

NO **YES**

NO **YES**

COST – INSIGHT ANALYSIS
Conduct a comparison of the Turnkey Solution against the likely outcome of a custom development in terms of:
- Ability to meet data/ analytic needs and use cases
- Likely time to deploy
- Flexibility to extend functionality in the future
- Cost in terms of licensing cost, maintenance fees, required human resources, and hardware or data storage services

Each central bank is likely to prioritize these differently

COST AND EFFICIENCY COMPARISON
The cost and efficiency implications of using an external service provider should be compared with the likely implications of an in-house build in terms of:
- Ability to meet data/ analytic needs and use cases
- Likely time to deploy
- Flexibility to extend functionality in the future
- Cost in terms of licensing cost, maintenance fees, required human resources, and hardware or data storage services

YES

NO

Turnkey solution meets all the defined data and analysis needs and meets the priorities of the central bank in terms of budget, resources, and efficiency…

If external development meets all the defined data and analysis needs and meets the priorities of the central bank in terms of budget, resources, and efficiency…

If in-house development meets all the defined data and analysis needs and meets the priorities of the central bank in terms of budget, resources, and efficiency…

TURNKEY SUPTECH SOLUTION
…it is likely that a Turnkey Solution will present the most effective and efficient way to implement the Remittance Reporting and Analysis System

EXTERNAL CUSTOM DEVELOPMENT
…it is likely that External custom development will present the most effective and efficient way to implement the Remittance Reporting and Analysis System

IN-HOUSE CUSTOM DEVELOPMENT
…it is likely that a Turnkey Solution will present the most effective and efficient way to implement the Remittance Reporting and Analysis System

ADDITIONAL RESOURCES

Based on consultations with 70+ central banks across geographies, here are the five tools for improving transaction-level remittance data collection and analysis that we continue to improve on an annual basis:

1. Assess the existing national framework for remittance data collection to determine gaps, data needs, and opportunities for macro-prudential and micro-prudential intervention. The *Assess the National Remittance Data Collection Landscape* guide provides a comprehensive list of relevant resources and stakeholders to consult when conducting a preliminary assessment, along with potential questions to ask.

2. While internationally, there are some differences in the systems and methods used to compile remittances, they are generally used for similar purposes in most countries. These purposes include being a tool for monetary policy, supporting financial stability, a socio-economic indicator, and a bridge to financial inclusion. The tool *Lessons Learned on Building an ITRS to Collect Remittance Data* documents the experience of 13 central banks worldwide that have successfully implemented an international transaction reporting system into their systems to collect remittance flows.

3. Leverage technology to collect granular data and the full potential of remittance system-generated data. *A Model for the Systematic Capture, Management and Analysis of Remittance Data by Central Banks* looks into key aspects of automated remittance data systems that will allow granularity, access to frequent data, and insights to be generated.

4. Collect but also analyse granular remittance data, including sex-disaggregated data. *The Case for the Collection and Analysis of Transaction-level, Supply-side Data on Remittances* examines examples of the analysis possible using granular supply-side data, the potential insights that could be generated, and how policymakers and remittance service providers can use them. It also explores how five central banks have gone beyond aggregate data reporting.

5. Implement the remittance reporting and analysis system following an outcome-focused approach. The *Design and Implement a Remittance Reporting and Analysis System* reference guide provides a simple approach for central banks to explore and define use cases and insights most supportive to the needs of reporting entities, most appropriate to the remittance market/economy, and most achievable in the operating environment that is often circumscribed by limited capacity and capabilities in low- and middle-income economies.

The United Nations Capital Development Fund

The United Nations Capital Development Fund (UNCDF) is the United Nations' flagship catalytic financing entity for the world's 46 Least Developed Countries (LDCs). With its unique capital mandate and focus on the LDCs, UNCDF works to invest and catalyse capital to support these countries in achieving the sustainable growth and inclusiveness envisioned by the 2030 Agenda for Sustainable Development and the Doha Programme of Action for the least developed countries, 2022–2031.

UNCDF builds partnerships with other UN organizations, as well as private and public sector actors, to achieve greater impact in development; specifically by unlocking additional resources and strengthening financing mechanisms and systems contributing to transformation pathways, focusing on such development themes as green economy, digitalization, urbanization, inclusive economies, gender equality and women's economic empowerment.

A hybrid development finance institution and development agency, UNCDF uses a combination of capital instruments (deployment, financial & business advisory and catalysation) and development instruments (technical assistance, capacity development, policy advice, advocacy, thought leadership, and market analysis and scoping) which are applied across five priority areas (inclusive digital economies, local transformative finance, women's economic empowerment, climate, energy & biodiversity finance, and sustainable food systems finance).