World Bank Project FASTT

Case Study: Iceland

EXP
(Express Payment System)
Instant Payment System | 2020

Payment Instruments

Credit Transfer

Use Cases / Services

Beneficiary Verification via Proxy
Account Verification

Bill Payments
Bulk/Batch Payments
Card Top Ups
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Access Channels</td>
<td>Modes of communication used by customers to access the FPS services, e.g., branch, internet, mobile, ATM, kiosk, phone.</td>
</tr>
<tr>
<td>2</td>
<td>Account Verification</td>
<td>Pre-verification process to verify that a beneficiary account exists.</td>
</tr>
<tr>
<td>3</td>
<td>Alias (Proxy)</td>
<td>Alternative to bank account numbers for increased convenience of the customer, e.g., mobile number, social security number.</td>
</tr>
<tr>
<td>4</td>
<td>Beneficiary Verification</td>
<td>Pre-verification process using a social security number. When a customer inputs the social security number of the beneficiary, the system replies with the name of the individual/company linked to the provided social security number.</td>
</tr>
<tr>
<td>5</td>
<td>Business Payment Type</td>
<td>Person to Business (P2B) – Payment from an individual to a business entity Business to Person (B2P) – Payment from a business entity to an individual Business to Business (B2B) – Payment between two business entities</td>
</tr>
<tr>
<td>6</td>
<td>Card Top Up</td>
<td>Service that allows users to top up their cards instantly, i.e., increase their credit card limit by transferring money from their account.</td>
</tr>
<tr>
<td>7</td>
<td>Clearing and Settlement Mechanism (CSM)</td>
<td>Mechanism used by the FPS to establish the sums representing obligations from one participant to all others (Clearing) as well as processes that would resolve these obligations by debiting and crediting the respective accounts within the Central Bank, i.e., within the RTGS (Settlement).</td>
</tr>
<tr>
<td>8</td>
<td>Credit transfers</td>
<td>Payment instruments based on payment orders or possibly sequences of payment orders made for the purpose of placing funds at the disposal of the payee.</td>
</tr>
<tr>
<td>9</td>
<td>Deferred Net Settlement (DNS)</td>
<td>In this settlement model, the Multilateral Net Settlement Positions of participants are accumulated over a defined period of time (referred to as Settlement Cycle), and settlement is deferred until a specific time. The accumulated Multilateral Net Settlement Positions, i.e. the amount of all transactions processed over that period of time are then settled in the RTGS.</td>
</tr>
<tr>
<td>10</td>
<td>Direct Participant</td>
<td>A participant in the FPS (EXP) who is responsible for the settlement of its own payments.</td>
</tr>
<tr>
<td>11</td>
<td>EXP</td>
<td>The FPS that was implemented in Iceland.</td>
</tr>
<tr>
<td>12</td>
<td>Fast Payment System (FPS)</td>
<td>As per CPMI, a Fast Payment System is defined as payments in which the transmission of the payment message and the availability of final funds to the payee occur in real time or near-real time and on as near to a 24-hour and 7-day (24/7) basis as possible.</td>
</tr>
<tr>
<td>S. No.</td>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>13</td>
<td>Government Payment Type</td>
<td>Person/Business to Government (P/B2G) – Payment from a person or business entity to a government institution. Government to Person/Business (G2P/B) – Payment from a government institution to a person or business entity.</td>
</tr>
<tr>
<td>14</td>
<td>High Value Payment (HVP)</td>
<td>A payment that is above the Transaction Limit defined and is therefore processed in the RTGS.</td>
</tr>
<tr>
<td>15</td>
<td>Income Category</td>
<td>Classification as per World Bank based on Gross National Income (GNI) per capita.</td>
</tr>
<tr>
<td>16</td>
<td>Individual Payment Type</td>
<td>Person to person (P2P) – Payment between individuals for non-business purposes.</td>
</tr>
<tr>
<td>17</td>
<td>Intra-day Liquidity Facility (ILF)</td>
<td>A facility that extends a loan to participants during the operating hours of the RTGS.</td>
</tr>
<tr>
<td>18</td>
<td>Iceland Krona (ISK)</td>
<td>The domestic currency used in Iceland.</td>
</tr>
<tr>
<td>19</td>
<td>ISO 20022</td>
<td>ISO 20022 is an open global standard for financial information.</td>
</tr>
<tr>
<td>20</td>
<td>Limit</td>
<td>It is the liquidity risk limit that is defined in EXP. It is the maximum debit position that a participant can have in EXP.</td>
</tr>
<tr>
<td>21</td>
<td>Low Value Payment (LVP)</td>
<td>A payment that is under the Transaction Limit defined and is therefore processed in EXP.</td>
</tr>
<tr>
<td>22</td>
<td>MBK</td>
<td>MiðlbankagreiðsluKerfið or MiðlbankaKerfið for short - directly translating as interbank payment system, consisting of the RTGS, EXP, and PAYHUB.</td>
</tr>
<tr>
<td>23</td>
<td>MBK Infrastructure</td>
<td>The collective term used to describe the MBK (RTGS, EXP and PAYHUB) including the integration with the RB Service Square.</td>
</tr>
<tr>
<td>24</td>
<td>Operator</td>
<td>The institution responsible for the operation of the payment system i.e., the Central Bank of Iceland (CBI).</td>
</tr>
<tr>
<td>25</td>
<td>Oversight</td>
<td>Regulating or governing body supervising the payments system i.e., the Central Bank of Iceland (CBI).</td>
</tr>
<tr>
<td>26</td>
<td>PAYHUB</td>
<td>The router/translator module.</td>
</tr>
<tr>
<td>27</td>
<td>Reiknistofa bankanna (RB)</td>
<td>The technical service provider of the Central Bank of Iceland (CBI).</td>
</tr>
<tr>
<td>28</td>
<td>RB Service Square</td>
<td>A collective name for referring to the VAS offered by RB.</td>
</tr>
<tr>
<td>29</td>
<td>RTGS</td>
<td>The Real Time Gross Settlement system.</td>
</tr>
<tr>
<td>30</td>
<td>Transaction Limit</td>
<td>A global value that is set in EXP for each payment. Any payment exceeding this value will be routed to the RTP by PAYHUB.</td>
</tr>
<tr>
<td>31</td>
<td>Value Added Service (VAS)</td>
<td>Value Added Services to the Fast Payment System (such as Account Verification, etc.).</td>
</tr>
<tr>
<td>S.No.</td>
<td>Term</td>
<td>Expanded form</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>2</td>
<td>Apps</td>
<td>Applications</td>
</tr>
<tr>
<td>3</td>
<td>BIS</td>
<td>Bank for International Settlement</td>
</tr>
<tr>
<td>4</td>
<td>CBI</td>
<td>Central Bank of Iceland</td>
</tr>
<tr>
<td>5</td>
<td>COTS</td>
<td>Commercial Off The Shelf</td>
</tr>
<tr>
<td>6</td>
<td>CPMI</td>
<td>Committee on Payments and Market Infrastructure</td>
</tr>
<tr>
<td>7</td>
<td>CSD</td>
<td>Central Securities Depository</td>
</tr>
<tr>
<td>8</td>
<td>GDP</td>
<td>Gross Domestic Product at current price</td>
</tr>
<tr>
<td>9</td>
<td>IBAN</td>
<td>International Bank Account Number</td>
</tr>
<tr>
<td>10</td>
<td>PSP</td>
<td>Payment Service Provider</td>
</tr>
</tbody>
</table>
Select Parameters

- **GDP**
  - $25.6 billion

- **Income Category**
  - High income

- **Population**
  - 372,520

- **Access to mobile phone***
  - 118%

- **Access to internet***
  - 100%

- **Bank Account***
  - 100%

- **Branches per 100,000 adult**
  - 26.6

- **Made or received digital payment in last 1 year (cashless ratio)**
  - 100%

- **Received government wages or transfer in account***
  - 98%

---

Sources: World Bank 2021 and GSMA 2022

* % of population age 15+
** World Bank 2021
How to read this report

- This deep dive report relates to the new Fast Payments System in Iceland.
- It has been developed based on primary interviews with key stakeholders such as the regulator and operator in the system as well as by leveraging secondary sources.
- Key secondary sources include the Central Bank of Iceland’s website, the World Bank website, the Bank for International Settlements (BIS), and other publicly available documentation along with their publications.
- The table below presents a legend to assist readers as they navigate through different sections of the report.

**Legend**

The first slide of every section includes a chapter summary to provide readers with an overview of the section contents.

The green box with the adjacent icon indicates section/sub-section summary across the report. Reader may choose to read through this for a high-level overview on the selected topic.
<table>
<thead>
<tr>
<th>A. Executive Summary</th>
<th>Slide number</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 – 10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Detailed Report</th>
<th>Slide number</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 – 39</td>
<td></td>
</tr>
</tbody>
</table>

1. **Overview**
   - 1.1. Background
   - 1.2. Objectives
   - 1.3. System Development and Key Timelines

2. **Business and Operating Model**
   - 2.1. FPS Structure
   - 2.2. FPS High Level Architecture
   - 2.3. Participants – Membership and Architecture
   - 2.4. Payment Instruments and Transaction Types
   - 2.5. Scheme Pricing and Fee Structure
   - 2.6. Use Cases

3. **User Adoption**

4. **Technical Details and Payment Process**
   - 4.1. Technical Details (Messaging Format and Customer Authentication)
   - 4.2. Transaction Process (Instant Credit Transfer Transaction Fulfilment, Liquidity Management and Settlement)

5. **Governance Framework**
   - 5.1. Legal and Regulatory Aspects
   - 5.2. Risk Management
   - 5.3. Customer Complaints and Dispute Resolution

6. **Clearing & Settlement Mechanism**
   - 7.1 CSM Structure
A. Executive Summary
Iceland had prior to 2002 used its RTGS (CBI-SG) system as a real-time payments system for high-value and retail payments. In 2002/2003, it implemented a Fast Payment System (FPS) known as CBI-JK to further drive digitization and fast payments in Iceland in both the gross and retail markets.

Beginning 2015, the Central Bank of Iceland undertook a project that focused on upgrading the payment infrastructure in Iceland in order to minimize risk, comply with changing rules and regulations, and further drive innovation.

As a part of this initiative the new Fast Payment System, EXP, which is a part of the MilliBankagreiðsluKerfið (MBK) infrastructure (translating as ‘interbank payment system’), was launched in 2020. MBK consists of EXP, RTGS and PAYHUB. It represents a significant milestone in strengthening Iceland’s financial Infrastructure, to facilitate alignment with international standards and best practices and further enable FinTech innovation.

The design, development and implementation of MBK took approximately 3 Years (2018-2020). The implementation of the FPS also included the implementation of a router/translator module that acts as the first point of contact for all payment instructions, referred to as PAYHUB. This router/translator model receives the payment message, analyzes the value of the payment instruction, and directs the payment instruction to either the RTGS for the processing of HVP or EXP for the processing of LVP.

Today, MBK is available to all the banks in Iceland. Currently, there are nine (9) domestic banks participating in the system.

Although there has been limited advancements to the FPS as of now, the reported downtime of the system itself has been zero since launch.

The Central Bank of Iceland is the regulator and operator of the only FPS in the country.

Reiknistofa Bankanna (RB) is the technical service provider and the current host of the MBK, alongside all the domestic bank’s deposit systems and other payment system softwares.

**KEY characteristics:**

- Real-time Payments
- Proprietary Messaging Format
- Fully Collateralized Settlement Method, i.e., no liability for the participants
- Router/translator Module
- Operates 24x7x365
- Direct participation for all regulated financial institutions
- Users can make payments via their providers’ traditional applications and/or third-party applications that have been integrated with their provider.

*Source: Central Bank of Iceland | Public Information*
Key Highlights and Takeaways

Summary: The intention of EXPs’ design was to upgrade the existing FPS in Iceland to dispose of the outdated underlying technologies and drive alignment with international standards and practices. The key features of EXP are listed below:

1. Fast Payments
EXP, which forms a part of the MBK, is Iceland’s new modernized FPS. It provides individuals, businesses, and government agencies the ability to send and receive low-value payments in real-time through their service provider.

2. Messaging Format
EXP is currently based on a proprietary format. The main benefits of using a proprietary messaging standard in Iceland are that:
   - Irrelevant of the intended system (RTGS or EXP), the payment instructions structure remains the same. The router/translator module will direct the payment to the appropriate system.
   - When upgrading the FPS, the impact on the banks was largely limited.

   However, there are plans to migrate both the RTGS and EXP to ISO 20022 by the end of 2025.

3. System Architecture
The current FPS system architecture is comprised of two modules, the FPS module, and the router/translator module. The FPS module provides for the real-time processing of low value payments thereby enabling the instantaneous sending and receiving of money. The router/translator module is responsible for directing payments to either the RTGS or EXP depending on the transaction amount.

   All payments are directed through the RB’s Service Square prior to being processed by either EXP or the RTGS. The RB Service Square enables value-added services such as Bill Payments, Batch payments, etc.

4. Settlement
Payments in EXP are settled on a Deferred Net Settlement (DNS) basis. Although settlement is deferred, end-users receive any funds sent instantly so they are not aware of this settlement mechanism. Limits defined in EXP are collateralized in the RTGS. This means that payments processed by EXP are cleared against collateral that the Central Bank of Iceland deems appropriate and acceptable at any time. There is thus no risk of participants not meeting payment obligations.

   There are plans to migrate to a pre-funded model in the future.

Key Success Factors

- Detailed Go-Live Runbook: Throughout the implementation, CBI spent a significant amount of time and effort in creating a detailed go-live runbook. Although it evolved significantly throughout the project, the go-live was very successful in part due to the detailed go-live runbook.

- Simplified Design: One of the main principles during the requirements finalization phase was to ensure that the design of the system, i.e., Iceland specific requirements, was kept as simple as possible to reduce the risk and complexity of the implementation.

Lessons learned

- Focus on non-functional testing: non-functional testing (such as load/stress testing, architectural setup and failover, and general technical operations of the system) is as important as functional testing to verify that the system is being developed and implemented in line with all the operational needs. CBI started non-functional testing far too late in the implementation process and it affected their business testing, general testing, overall solution setup, and timelines significantly.

- Participant involvement and readiness: It is important to factor in the impact of change required for banks. Implementing an FPS is a long process and requires a lot of time, effort, and money. Plugging off-the-shelf solutions into the proprietary framework of the financial community does not necessarily reduce the time, effort, or money required, which should not be underestimated. It is common to underestimate the scale of change required by participants as it is not only a technological one, rather all areas in an entity are impacted from governance, policy, and strategy to back-office operational processes.

- The use of RTGS as an FPS: Iceland’s usage of the RTGS system is slightly different because it uses this system mainly as an FPS, which has some downsides since RTGS systems are generally not designed for this purpose.

- Development of EXP: EXP was not developed in alignment with the international FPS standards as this would have had an impact on legacy systems. At the time, a decision to limit the impact was taken. Although it was a fair decision, it does require CBI to now undertake an upgrade project which will impact market participants and legacy systems.
B. Detailed Report
1. Overview

Chapter sections:
• 1.1. Background
• 1.2. Objectives
• 1.3. System Development and Key Timelines

Chapter Summary:
• The payments market within Iceland has seen rapid changes in the past few years. New payment solutions and technologies are the driving force behind these changes. The digitization of payments started as early as the 1980s. Payments are arguably the most important and successful endeavor when considering the financial infrastructure. The citizens have embraced this transformation and the value it added to their lives (over ninety percent of Icelanders own a smartphone, and customers prefer to do their banking via their mobile phones).
• Part of the Central Bank of Iceland’s mandate is to drive initiatives that further promote a safe and effective financial system.
• The FPS, EXP, was developed as a result of the payment infrastructure upgrade initiative launched by the Central Bank. The upgrade initiative focused on minimizing risks, enabling further innovation, and driving compliance with changing international standards, rules, and regulations.
• The upgraded FPS was designed with the ultimate goal of providing an infrastructure that is more capable of evolving with the ever-changing, fast-moving payment trends and technologies. An innate benefit of the upgrade was the ability to align the systems to international standards and best practices.
• EXP is based on ISO 20022, however participants communicate with the MBK infrastructure in a proprietary messaging standard format that is transformed by PAYHUB into an ISO-like messaging format. This messaging standard allowed CBI to minimize the overall impact of implementing the new FPS.
• All modules included in the payment infrastructure upgrade (RTGS, EXP, PAYHUB) were acquired from SIA/Perago, now Nexi/SIA.
• The implementation took approximately three (3) years and was launched in 2020.
• Post launch, there has not been any significant enhancements and/or innovations rolled out, however the system has experienced zero downtime.
• The Central Bank of Iceland manages all interbank payments in the country: it currently processes up to one million payments per day with peaks of 160,000 per hour - despite the small population of just over 370,000 inhabitants.

Source: Central Bank of Iceland | Public Information
In 2015, a Request for Information (RFI) was issued. There were five different vendors which qualified for the RFI and subsequently, four were invited to respond to the Request for Proposal (RFP). The RFP detailed the need to replace older mainframe solutions (CBI-SG and CBI-JK) that had long been in operation. The CBI-SG was the high-value payment (HVP) system and the CBI-JK was the low-value payment (LVP) system. The previous systems already catered for the real-time functionality based on Central Bank money.

The RFP detailed that the Central Bank of Iceland was looking for a system that can handle both HVP and LVP; vendors were free to propose one system or two systems that are integrated. Irrelevant of the COTS solution proposed, CBI highlighted the importance of the solution communicating with the participants’ core banking systems. The reason is that the current CBI-SG and CBI-JK and the participants’ core banking systems worked very efficiently together through the infrastructure of CBI’s IT service provider, RB, and ensured smooth STP based on non-SWIFT messages between customers, the participants’ core banking systems, and the two interbank systems.

The introduction of a new updated FPS was primarily driven by the Central Bank of Iceland in support of the payment infrastructure upgrade initiative. The initiative called for the decommissioning of older systems based on dated technologies and the implementation of forward-looking systems that meet the future financial and economic needs of Iceland.

The MBK infrastructure’s design inherently supports integration with the RB Service Square. The Service Square ensures integration between the MBK and participants’ banking systems per the tender requirements. The Service Square furthermore supports the development and provisioning of ‘overlay’ services that offer innovative payment services to end-users. An example of such value-added services is batch or bulk payments, account verification, and beneficiary verification.

The MBK infrastructure consisting of the RTGS, EXP and PAYHUB (the router/translator), including the integration with the RB Service Square has been designed to be interoperable and extensible, meaning it will evolve to meet the future needs of citizens, businesses, and government agencies.

The MBK infrastructure was designed and developed to provide the necessary infrastructure for fast payments that aims to minimize operational risks, operate on a 24x7x365 basis in real-time, and enable secure straight-through processing (STP) between CBI and the participants.
1.2. Objectives

The purpose of this project was to decommission the older systems utilizing outdated technology, drive compliance with international standards and best practices, and identify areas in which innovation in the payments system may be improved.

The main objectives were to minimize risk, drive compliance with international standards, and implement a system that was capable of keeping in step with the ever-changing payments trends.

Furthermore, the system-specific objectives included the design and implementation of a safe, efficient, interoperable, modern and robust payment system. A system that will provide an equitable and stable digital financial system enabling every individual and business to make any payments digitally in a simple, fast, low-cost, and secure manner.

Objectives

The following objectives formed the basis of the payments infrastructure upgrade initiative:

- Decommissioning of older technologies i.e., moving away from mainframe technology.
- Support compliance with the Principles for Financial Market Infrastructures (PFMIs).
- Replacement of previously-developed in-house core banking systems with standardized solutions.
- Optimize the total cost of ownership.
- Ensure the seamless integration between:
  - Central Bank-owned systems and other privately owned systems, such as the CSD that similarly underwent replacement/upgrades.
  - Participant back-office systems that were similarly undergoing replacement/upgrades.
  - Other CBI front, middle, and back-office systems that are being replaced with commercial-off-the-shelf (COTS) software.

Key Considerations

- Investment Cost
- Operational Efficiency
- Implementation Time
- Compatibility and Interoperability
- Alignment with the evolution of international payment trends
- Real-time interbank payment intermediation in central bank money
1.3. System Development and Key Timelines

MBK was a COTS solution with some customization that was developed and implemented in 3 years.

**Development and Implementation Process**

- The payment infrastructure upgrade initiative was driven and managed by the Central Bank of Iceland.
- Through a comprehensive and transparent vendor selection process, SIA/Perago, now Nexi/SIA, were selected.
- The new payment infrastructure utilizes different payment systems/modules (RTGS, EXP, PAYHUB and the RB Service Square).
- Although the solution is largely off-the-shelf there was some customization in order to cater for the Icelandic-specific requirements.
- A key design consideration was to ensure that the new modules fit into the existing proprietary instant credit transfer method that the market was already using so that participants did not feel a big change in sending in payment instructions.
- There are plans to continue the evolution of payment systems in the years to come. The new functionalities will be rolled out in accordance with the roadmap and market needs.
- There were mainly two streams of work for the implementation process:
  1. The first stream dealt with the solution itself, testing it, and getting it to work according to the user stories defined.
  2. The second stream was related to the integration with the market. All banks in the domestic market have the same technical service provider, RB, hence they were the only point of contact for integration with the market.

**Development & Implementation Timelines**

**Development Cost**

- Inner costs ~USD 5m (estimated salary of staff).
- Outer costs ~USD 3m. The above costs do not account for the costs borne by the participants and RB from implementing and adjusting to the system.

Subsequently, there have been limited costs related to maintenance and/or upgrades. However, this is expected to change when the system is upgraded to comply with ISO 20022 and SCT Inst-like rulebooks.

**Implementation Time**

~3 years.

**Key Timelines**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RFI June 2015</td>
<td>RFP 2016</td>
<td>UAT Testing</td>
<td>Go-Liv of MBK October 2020</td>
</tr>
</tbody>
</table>

* The implementation, costs, and timelines include those related to the RTGS, EXP, and PAYHUB modules.
2. Business and Operating Model

Chapter Summary:

- The Central Bank of Iceland is the owner, operator and regulator of the FPS.
- Clearing happens in the EXP system and settlement takes place in the RTGS on a Deferred Net Settlement (DNS) basis. Settlement is guaranteed through the reservation/earmarking of liquidity, the credit that is then extended for clearing in the EXP system is subject to the limit set.
- The core capabilities of EXP provide users with the ability to initiate and receive real-time payments in a safe and secure manner. There are a number of overlay services enabled by the RB Service Square.
- The EXP infrastructure has been developed in order to manage up to 5 million payments per day and each transaction is on average processed in less than 40 milliseconds.
- The core capabilities coupled with the value-added services lay the foundation upon which participants can build and offer innovative products and services.
- The EXP infrastructure currently only supports domestic banks joining as direct participants.
- The commercial banks within Iceland were not mandated to participate in EXP. However, due to the design and integration (the ‘set-up’) of the legacy systems, banks could not offer banking services without significantly altering the services offered or requesting the CBI to change the setup.
- All transactions below ISK 10 000 000 (USD 71 000) must be routed through EXP. Transactions above the aforementioned limit are routed through the RTGS. These limits may be adjusted based on market needs.
- EXP processes payments only in the domestic currency, Iceland Krona (ISK).
- The EXP system alongside the value-added services (account verification, bulk payments, etc.) can be accessed by end customers through their service providers’ accepted channels.
- The pricing scheme developed for participants is based on a cost recovery model and aims to cover the full costs of developing, maintaining and operating EXP. Participants are charged a fixed monthly fee based on their balance sheet size and the volume of transactions initiated. The cost of operating the system is evaluated and adjusted on a yearly basis, the participants are charged for a certain percentage of these costs.
- Customers are not directly charged for making real-time instant credit transfers.
- Currently, EXP supports the following transaction types: Individual, Business and Government.
- The EXP integrated with PAYHUB and the RB Service Square supports bulk/batch payments, P2P transfers, B2B transfers, bill payments, wholesale payments (if less than ISK 10M), and card top ups.

Chapter sections:

- 2.1. Governance Structure
- 2.2. Architecture
- 2.3. Participants
- 2.4. Payment Instruments and Transaction Types
- 2.5. Aliases and Access Channels
- 2.6. Scheme Pricing and Fee Structure
- 2.7. Use Cases
2.1. FPS Structure

- The Central Bank of Iceland is the regulator and operator of all the payment systems in Iceland.
- RB is the technical service provider of the Central Bank and hosts various payment systems on behalf of the Central Bank.
- Currently only domestic banks participate in EXP. Although foreign banks are not banned by any rules, regulations, or participation agreements, the current system has some technical limitations that prevent foreign banks/other entities from participating in the EXP.
- The clearing and settlement mechanism (CSM) is achieved as a two-step process by two independent systems. Both systems are owned by the Central Bank of Iceland.

### Regulator and Operator
Seðlabanki Íslands 'Central Bank of Iceland (CBI)'
As the regulator, the CBI is responsible for ensuring the safety and stability of the financial system. Performs supervision and oversight of the financial systems, schemes, and participants. As the operator the CBI is responsible for day-to-day operations.

### Technical Service Provider
Reiknistofa bankanna (RB)
Responsible for hosting MBK. Moreover, RB provides value-added services through the RB Service Square that are not offered as a part of the FPS.

### Participants

#### Banks
Only Domestic banks **participate in EXP** as direct participants subject to fulfilling the relevant eligibility criteria. Foreign Banks/other entities cannot participate in EXP due to the technical architecture and technical setup of the MBK Infrastructure.

### Source:
Central Bank of Iceland | Public Information
2.1. FPS High-level Architecture

- The Central Bank of Iceland is the owner, regulator, and operator of the FPS.
- The FPS is hosted by RB, the technical service provider of the Central Bank of Iceland.
- EXP is a Systemically Important Payment System (SIPS) in the financial infrastructure of Iceland.

EXP provides for the clearing of low-value payments in real-time.
Clearing happens in EXP subject to limits collateralized in the RTGS. Settlement is managed on a Deferred Net Settlement (DNS) basis via multiple settlement cycles during the business day.
The collateralized limits guarantee settlement thereby reducing the liquidity and settlement risk.
EXP today provides for individual/single-shot payments.
The system is available 24x7x365 for payments.
The system is based on a proprietary message format.
End users can access MBK infrastructure-based services via their service providers.
Participants connect to MBK via the RB Service Square provided by RB, the technical service provider of the Central Bank.
The RB Service Square provides other functionality that participants have access to such as Batch/Bulk Payments, Account Verification, Beneficiary Verification, Bill Payments etc.
In general, any domestic bank can become a participant if:

- The entity has obtained the required license from the Central Bank of Iceland.
- The entity has successfully undergone the onboarding process mandated by the Central Bank.
- The entity has signed the relevant participant agreement.
- The entity has the ability to manage its activity in EXP in accordance with the requirements as stipulated in the participant agreement.

As of May 2023, there are:
- 9 direct participants.

The exact figures cannot be disclosed however it took about 40,000 man-hours. The majority of the cost came from the work required to integrate the Service Square with the router/translator module and participants’ back-office systems.

Eligibility Criteria for Participants

- In general, any domestic bank can become a participant if:
  - The entity has obtained the required license from the Central Bank of Iceland.
  - The entity has successfully undergone the onboarding process mandated by the Central Bank.
  - The entity has signed the relevant participant agreement.
  - The entity has the ability to manage its activity in EXP in accordance with the requirements as stipulated in the participant agreement.

Onboarding Process

Valid Permit In order to initiate the application process a participant must have received a valid permit to operate as a bank / financial institution from the FSA (which is a part of the central bank).

Application process CBI provides initial Membership Documentation. The applicant provides the completed Participation Application and supporting documents.

Acceptance of participant application CBI accepts the application if all eligibility requirements have been satisfied.

Plan and Build The Participant develops a project plan and builds the system as per the technical design specifications.

Certification Participants are required to successfully complete certification testing to verify compliance with technical and non-technical requirements.

Documentation Participants have signed the relevant participant agreement.

Fees Participants have agreed to pay fees, penalties, and operating charges related to EXP.
2.3. Payment Instruments and Transaction Types

Payment Instruments Supported

- The MBK Infrastructure enables consumers, businesses, and other systems to make payments in ISK between any participating financial institutions.

- Transactions below ISK 10 000 000 (USD 71 000) are processed through EXP.

ILLUSTRATIVE

Payment Type, Limit and Currency

Payment Types and Transaction Limits

<table>
<thead>
<tr>
<th>Payment Types (Though Participating Service Providers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
</tr>
<tr>
<td>Business</td>
</tr>
<tr>
<td>Government</td>
</tr>
</tbody>
</table>

Transaction Limit

ISK 10 000 000 (USD 71 000)

Transaction Currency

ISK

Source: Central Bank of Iceland | Public Information
2.5. Scheme Pricing and Fee Structure

Pricing for any payment system is an important aspect that directly affects the adoption of the solution. The Central Bank of Iceland has adopted a pricing scheme that aims to recover the full costs of developing, maintaining, and operating the MBK without affecting its adoption adversely.

---

**ILLUSTRATIVE**

**1. Fee charged by users/payees**

Although not legislated, participants do not directly charge users any fees for using any of the services.

**2. Fee charged by CBI**

- CBI levies the following fees:
  - Fixed cost for initial connection to the system which is 6,000,000 ISK for small participants (balance sheet < 10 billion ISK) and 12,000,000 for bigger participants (balance sheet > 10 billion ISK).
  - Fixed monthly fees based on their balance sheet size and estimated payment volume. This fixed monthly fee is related to the costs incurred by CBI for operating the system. These costs are reevaluated each year and the tariff for the following year is calculated accordingly.
  - No exception handling fees. Technically a part of the above-described tariffs includes change requests / extra work requested by participants which are individually charged to them based on the request being made.
  - No violation charges. CBI does not levy any financial penalties if a participant has violated a requirement in the agreement. However, if a violation occurs it may affect the participants participation rights.

---

Source: Central Bank of Iceland | Public Information
### 2.6. Use Cases 1/2

#### Individual Transfers

- Used by individuals within their banking apps or on their mobile or browser.
- There are additionally apps that allow individuals to connect debit and credit cards and then transfer from these cards to individual bank accounts. These apps leverage the instant payment infrastructure so that when an individual makes a payment using their card, these companies make an instant payment transfer to the beneficiary. Some of these companies also offer their own smart addressing service.

#### Business Transfers

- Businesses use instant payments for various reasons, either using net banks, a browser, or indirectly through bill payments.

#### Account Verification and Beneficiary Verification (via Proxy)

- These services are tied together.
  - **Step 1:** Beneficiary verification (via Proxy).
  - **Step 2:** Account Verification.
- Step by step, when making a payment through a mobile banking app or browser, the individual must first input the beneficiary’s social security number (Beneficiary Verification via Proxy) and only once verified is an individual able to move on to the account verification step. If the account information inputted is valid then the individual may input the amount.
- If the payee party was previously paid, then the individual can select them from the quick select / previously used transfers list i.e., step 1 and step 2 above are circumvented.
### Batch/Bulk Payments

**Payment Instruments**
- Credit Transfer

**Access Channels**
- Mobile, Online Etc.

- This system, offered by the Service Square, enables businesses and government bodies to send in a batch file that is then broken down into individual instant payments and processed through MBK.
- Government makes use of this service for salary payments.

### Bill Payments

**Payment Instruments**
- Credit Transfer

**Access Channels**
- Mobile, Online Etc.

- The bill payment system is facilitated through the Services Square. It has various applications and is widely used by businesses to charge customers, governments to charge individuals, businesses to charge other businesses, or even government bodies to charge other government bodies.
- Every domestic bank shows unpaid bills through their apps and when these bills are paid it uses EXP.

### Wholesale Payments

**Payment Instruments**
- Credit Transfer

**Access Channels**
- Online etc.

- EXP is used when domestic banks are paying other domestic banks.
- These payments are facilitated through EXP as long as the value amount is below 10m ISK.

### Card Top Ups

**Payment Instruments**
- Credit Transfer

**Access Channels**
- Mobile, Online Etc.

- The instant payments are used when individuals are topping up their cards, i.e., users can increase credit card limit by transferring from their account.
Chapter Summary:

- Iceland has had an FPS since 2002/2003. In 2020 they launched the new upgraded system. As such the volumes have remained unchanged.
Iceland has had an FPS since 2002/2003. In 2020 they launched the new upgraded system. As such the volumes have remained unchanged.

Banking and FPS adoption were hand-in-hand at the start of the century. The FPS evolved alongside digital banking largely due to the fact that it was all created and hosted by a single technical service provider. Financial inclusion has therefore been very high in Iceland (nearly 100%) and the digital penetration and early FPS adoption has no doubt had positive impact on economic development.

Icelanders are avid users of debit and credit cards which constitute most (>90%) retail payments in Iceland, but they currently have no direct contact with EXP. Debit cards used to be dependent on clearing through the EXP but have now been moved to international rails to coincide with the clearing and settlement of credit cards. Non-cash payments have been very prevalent since 2000.

The implementation of the current FPS added nothing to the previous use cases or volumes and has only recently reduced slightly due to the off railing of debit cards, as previously mentioned.

### Statistic Insights

**Transaction Volumes**

**Transaction Values (ISK Mil)**

Source: Central Bank of Iceland | Public Information
4. Technical Details and Payment Process

Chapter sections:

- 4.1. Technical Details | Messaging Format, QR Codes, and Initiation Technology
- 4.2. Transaction Process (Transaction Fulfilment, Liquidity Management, and Settlement)

Chapter Summary:

- The MBK Infrastructure uses a proprietary messaging standard. There are plans to adopt ISO 20022 messaging standard by 2025.
- EXP-destined payments are subject to the same customer authentication standards banks use for all of their transactions.
- The payment process does not require any customer registrations other than is required for banks by KYC / AML law.
- Customers are not required to register with their participating financial institution if they want to use the smart addressing service to send/receive payments into their account. The process is automated in that when a customer creates a bank account the bank automatically adds it to this registry linking it to the social security number.
- There are a number of confirmation and clearing steps and settlement steps that occur in quick succession to enable users to make payments with immediate funds available to the payee – cf. slides 29-30.
- Transactions are settled via the RTGS, on a Deferred Net Settlement (DNS) basis at predefined intervals.
- Settlement is guaranteed as participants are required to pledge collateral to cover their exposures in EXP. A limit is extended to the participant in EXP subject to the amount of funds reserved in the RTGS.
- Participants have access to an Intra-day Liquidity Facility (ILF) in the event they require additional liquidity to meet their daily settlement obligations.
- Currently the MBK infrastructure cannot be accessed via API. However, the CBI is in the process of conducting the necessary studies to determine how the use of APIs could be used to increase P2B payment usage, for example exposing MBK to third-party providers via APIs.
- QR code-based payments are not yet a part of the MBK infrastructure.
• EXP payments are made by logging into the Internet and mobile banking application of a participating financial institution and authorizing the payment. This means that EXP payments are subject to the same fraud and security protections including customer authentication standards banks use for all of their internet and mobile banking transactions i.e., biometrics, two-factor authentication, etc.

• There are no specific customer authentication standards for making an EXP payment.

Source: Central Bank of Iceland | Public Information
EXP allows customers of a participating service provider to make payments from their account to a customer of another participating service provider with immediate funds available to the payee.

- From the perspective of the customers, the process is simple and takes only moments.
- There are a number of confirmation and clearing and settlement steps that occur in quick succession to make this happen.

When paying a new Beneficiary, the Beneficiary Verification and Account Verification process are executed prior to allowing the Originator to capture the amount thereby initiating the instant credit transfer.
### 4.2. Transaction Process | Instant Credit Transfer Transaction Fulfilment

The **customer does not need to register to make payments through EXP**. The customer simply **accesses the service through his/her preferred channel**. Should the customer want to receive funds using aliases then the customer needs to register an alias. Various aspects of these steps are covered in the ensuing pages.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>If a customer (the originator) is paying a new beneficiary he/she must first successfully pass the Beneficiary and Account Verification Processes prior to allowing the customer to input the amount of the transaction.</td>
</tr>
<tr>
<td>1</td>
<td>A customer (the originator) initiates an instant payment through his/her preferred channel (mobile, online, branch etc.).</td>
</tr>
<tr>
<td>2</td>
<td>Upon confirmation, the Originator participant creates the payment message and sends it to the RB Service Square for processing.</td>
</tr>
<tr>
<td>3</td>
<td>The RB Service Square sends the payment instruction to EXP for processing.</td>
</tr>
<tr>
<td>4</td>
<td>Within EXP the instant credit transfer is validated and processed.</td>
</tr>
<tr>
<td>5</td>
<td>EXP processes the payment. If there is insufficient liquidity the payment is rejected. If there is sufficient liquidity the payment is accepted and finalized i.e. clearing finalization.</td>
</tr>
<tr>
<td>6</td>
<td>The EXP will send the payment confirmation to the RB Service Square.</td>
</tr>
<tr>
<td>7</td>
<td>The RB Service Square sends the confirmation/rejection to the originator participant and the beneficiary participant.</td>
</tr>
<tr>
<td>8</td>
<td>The originator participant sends the confirmation of debit to the originator. The beneficiary participant sends the confirmation of credit to the beneficiary.</td>
</tr>
<tr>
<td>9</td>
<td>Per the DNS mechanism, EXP will send the settlement obligations to the RTGS at predefined intervals throughout the day. Once the RTGS has processed the settlement obligations it will send a message to EXP confirming the same.</td>
</tr>
</tbody>
</table>

Source: Central Bank of Iceland | Public Information
4.2. Transaction Process | Liquidity Management and Settlement

**Settlement Mechanism**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Deferred Net Settlement (DNS)</th>
<th>Type</th>
<th>Time</th>
<th>Predefined Intervals</th>
<th>Settlement Institution</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Participants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• A Deferred Net Settlement (DNS) model is used, which means that payments are cleared in EXP and settled at predefined intervals throughout the business day in the RTGS.</td>
<td></td>
</tr>
<tr>
<td>• EXP participants hold settlement accounts in the RTGS.</td>
<td></td>
</tr>
<tr>
<td>• Participants need to pledge collateral in the RTGS to cover their exposure in EXP.</td>
<td></td>
</tr>
<tr>
<td>• The limit set in EXP is the maximum exposure that a participant can have against the system at any given time.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liquidity Management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• The model adopted by CBI for its operations is based on the concept that participants can only process Payments if their Net Position within EXP doesn't exceed the set limit.</td>
<td></td>
</tr>
<tr>
<td>• The participants’ limits are equivalent to the collateral pledged in the RTGS and moved from the collateral pool held in the RTGS to EXP.</td>
<td></td>
</tr>
<tr>
<td>• The Central Bank has a special list of accepted collateral that the participants can use. To minimize any liquidity risks, the limit is calculated by applying a discount to the collateral value. No intermediaries are necessary except a CSD for pledging. Participants can't create an unsecured position within the system.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Central Bank of Iceland | Public Information
5. Governance Framework

Chapter sections:

• 5.1. Legal and Regulatory Aspects
• 5.2. Risk Management
• 5.3. Dispute Resolution

Chapter Summary:

• The legal framework, Act No. 92/2019 on the Central Bank of Iceland, gives the Central Bank of Iceland an explicit mandate to promote price stability, financial stability, and sound and secure financial activities in Iceland.

• The Central Bank of Iceland plays multiple roles in the MBK infrastructure: oversight, regulator, and operator.

• The Central Bank of Iceland has a risk management framework to identify and manage the risks to which the payment and settlement systems may be exposed. This framework enables CBI to identify and routinely assess the risks that might arise from the operation of the payment and settlement systems, from its interdependencies with other systems, and the risks that participants pose to the system.

• EXP is not exposed to credit risk as it does not extend credit to participants, nor does it establish procedures for participants to extend credit among themselves.

• The MBK Infrastructure was designed and built with security front of mind. The integrity and performance of the MBK Infrastructure are safeguarded by minimum technical, operational, and security obligations that must be met by participating banks.
5.1 Legal, Regulatory and Governance Aspects

The legal framework in Iceland provides an explicit mandate to CBI for regulating the payment and settlement systems.

### Institutional and Governance Framework

#### Legal Framework

#### Regulator, Overseer and Operator:
- The Central Bank of Iceland

#### Technical Provider:
- Reiknistofa Bankanna

Along with the states of the European Union, Norway, Liechtenstein and Iceland are a party to the Agreement on the European Economic Area (EEA Agreement), but the agreement was ratified in Iceland by Act No. 2/1993.

Iceland’s regulatory framework for payments is therefore mainly based on EU’s regulatory framework i.e., the latter mentioned has been transposed into national law. As an example, EU’s Directive 98/26 (the Settlement Finality Directive, SFD) has been transposed into Act No. 90/1999 on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems but the MBK falls under the scope of that Act and the system has been notified to ESA and ESM. cf. Art 3 cf. also Art 1.

The implementation of the MBK did not as such call for amendments or modification of the Act but the aforementioned notification needed to take place once the MBK went live in October 2020. At the same time, new Rules No. 1030/2020 on the Central Bank of Iceland Interbank Payment System (MBK-Rules) entered into force, but their issuance is based on Article 46 (Para2) of Act No. 92/2019 on the Central Bank of Iceland cf. Article 34 in the Rules.

It should also be mentioned that EU's Directive 2015/2366 (PSD2) has been transposed into Icelandic law cf. Act No. 114/2021 on Payment Services.

A more detailed list of existing laws and rules on payments in Iceland and regulatory instruments pertaining to the Central Bank of Iceland may be accessed on the Central Bank’s website, [here](#).

---

### Act References

- Act no. 92/2019 on the Central Bank of Iceland
- Act No. 90/1999 on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems
- Act No. 114/2021 on Payment Services
- Rules No. 1030/2020 on the Central Bank of Iceland Interbank Payment System
5.1 Legal, Regulatory and Governance Aspects

The legal framework in Iceland provides an explicit mandate to CBI for regulating the payment and settlement systems.

- The Central Bank of Iceland which is an independent, state-owned institution, cf. Article 1 of Act on The Central Bank of Iceland, No. 36/2001, with subsequent amendments. CBI owns and operates the payment system. It also has oversight responsibilities over the system. CBI also acts as a participant in its capacity as the Treasury’s bank.

- The Central Bank of Iceland is required by law to promote financial stability and sound and secure financial activities. The CBI shall also undertake such tasks as are consistent with its role as a central bank, such as promoting a safe, effective financial system, including domestic and cross-border payment intermediation.

- The Bank’s oversight of financial market infrastructure aims at promoting security, efficiency, and efficacy of core infrastructure in the Icelandic financial system, or systemically important financial market infrastructure (including the MBK), thereby safeguarding financial stability.

- According to Governor’s Decision no. 1452 of 10 May 2023, the criteria laid down in the BIS/IOSCO Core Principles for Financial Market Infrastructures (PFMIs) shall form the basis of the Central Bank’s oversight and operation. As for the MBK, this is also stipulated in Article 31 of the aforementioned MBK-rules No. 1030/2020. Decision no. 1452 also states that the BIS-(CPMI)/IOSCO Guidance on cyber resilience for financial market infrastructures (2016) shall apply.

- Based on a self-assessment against the PFMIs criteria and the cyber guidance, oversight will evaluate compliance and if needed advice in order to seek to ensure compliance. In the unlikelyhood of significant non-compliance, it may be expected that oversight would raise such issues to the audit and/or to the Financial Stability Committee that operates according to Chapter IV of the Central Bank Act, No. 92/2019. The Committee is amongst others comprised of the Governor and the bank’s three Deputy Governors.

- As already mentioned, the technical operation of MBK is outsourced to Reiknistofa Bankanna (RB) which needs to comply to Annex F of the PFMIs.

- Further reading about CBI’s oversight of Icelandic financial market infrastructures, please see here.*

*Note: The website refers to Governor’s Decision no. 1242 but that decision has been replaced by Governor’s decision no. 1452.
5.2 Risk Management

The Central Bank of Iceland has extensive contingency plans and a risk management framework that supports the reduction of risks related to the payment systems in Iceland. Moreover, Iceland has wide-ranging legal laws, rules, and regulations that support the reduction of risks.

Legal and Regulatory Framework

- Iceland has a sound legal and regulatory framework underpinning its Payment systems, see below (non-exhaustive):
  - Act no. 92/2019 on the Central Bank of Iceland
  - Act No. 90/1999 on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems
  - Act No. 114/2021 on Payment Services
  - Rules No. 1030/2020 on the Central Bank of Iceland Interbank Payment System

- Iceland is a party to the Agreement on the European Economic Area (EEA Agreement) but the agreement was ratified in Iceland by Act No. 2/1993. Iceland’s AML/CFT regulatory framework is therefore mainly based on EU’s regulatory framework i.e., the latter mentioned has been transposed into national law.

- Parliament has passed Act No. 140/2018 on measures against Money Laundering and Terrorist Financing but its objective and scope can be seen from Articles 1 and 2. The Act, that constitutes the implementation in law of Directive (EU) 2015/849 cf. Art. 57, uses the term “Obliged entities” but those are entities that carry out activities that can be used for money laundering or terrorist financing, namely those listed under Article 2. The function of the Financial Supervisory Authority, now operating within the CBI, is to supervise these entities and ensure that they comply with the provisions of the aforementioned Act i.e., that they know the identity of their customers and their activities and notify the competent authorities of suspicious transactions.

- As for CBI’s interbank system (MBK) Rules No. 1030/2020 require that a party requesting to become a participant in the MBK shall demonstrate upon filing an application that it satisfies among other things that it has adopted written rules and maintains internal controls aimed to prevent the operations from being used for money laundering or terrorist financing, cf. the provisions of the abovementioned Act (No. 140/2018) and the relevant rules and guidelines, cf. Art. 3 (Para 1, Point 3). According to the Article branches of financial institutions outside EEA (the European Economic Area) shall demonstrate that their rules and internal controls are comparable to those required according to Act No. 140/2018. According to Article 25 (Para2) of Rules No. 1030/2020, participants in the MBK shall at all times have in place a reliable system for monitoring risk in connection with the use of the interbank system, including in respect to money laundering.

- For further information please see CBI’s Financial Supervision website, here

AML/ CFT

- To mitigate credit and liquidity risks, a limit is set in EXP which is collateralized in the RTGS.

- The Central bank has a special list of accepted collateral. To minimize any liquidity risks a discount is applied on the value of collateral so the participants can’t create an unsecured position within the system.

- Each participant has a “counter”/ “limit” in MBK which shows their net position during that settlement cycle. Two times a day, at 08:30 and at 16:00 there is a settlement cycle where funds are moved between participants based on their net position in MBK and the counters are reset.

Source: Central Bank of Iceland | Public Information
The Central Bank of Iceland has extensive contingency plans and a risk management framework that **supports the reduction of risks** related to the payment systems in Iceland. Moreover, Iceland has wide-ranging legal laws, rules, and regulations that support the reduction of risks.

### 5.2 Risk Management

**Operational Risk**

- Participants have to meet predefined criteria at a business and technical level. Moreover, participants are subject to **active monitoring and continuous oversight**. This includes undergoing a certification testing process before being admitted to participate in the system.
- The Central Bank of Iceland has **extensive disaster recovery plans and business continuity plans** in place that have been tried and tested.
- The entire system is **actively monitored** and managed at a business (positions of participants and industry as a whole) and technical level (at a network, infrastructure, and application), to ensure that the overall health of the system and the interfaces remain operational.
- The CBI has Incident Management policies in place at several levels. There are policies in place with the MBK vendor, Nexi, and the RB Service Square provider, RB. The Incident Management policies define **response/SLAs for identified risk/event types and require that 24x7x365 response teams be in place**. Participants are required to have **24/7 operational support teams and resourcing to respond to alerts or incidents** in place, however, all domestic participants rely on RB for round-the-clock surveillance of infrastructure hosted there. The CBI requires each participant to have an incident response plan.

**Clearing & Settlement Finality**

- **Clearing finality** ensures that **all successful transactions within MBK are irrevocable and final**. Clearing finality ensures that the transactions of a defaulting participant would be honoured as final or cannot be considered void or voidable by liquidators and relevant authorities.
- **Settlement finality** ensures that **all successfully cleared transactions in EXP are successfully settled in the RTGS**. Once a payment has been settled in the RTGS, it is considered final and irrevocable regardless of insolvency procedures or judicial sanctions concerning civil or commercial matters in which the participant may have engaged, including any insolvency resolution or bankruptcy declaration concerning any participant.

**Data Management**

- **CBI safeguards the sensitive data of the users and ensures that it remains completely secure**. This is underpinned by the below-cited laws and rules:
  - Chapter VI in Act No. 114/2021 on Payment Services has provisions on data protection (Art. 98), how the processing of personal data shall be handled, and security issues (Art. 99 and 100). The Act applies to payment services provided in Iceland cf. Art. 1. According to Art. 102 the CBI’s Financial Supervisory Authority shall supervise the implementation of the Act with regard to supervised entities as provided for in Act No. 87/1998 on Official Supervision of Financial Activities.
  - The principal provisions concerning the regulatory functions of the Financial Supervisory Authority are laid down in Chapter III of Act No. 87/1998 on the official supervision of financial operations, as subsequently amended for more information cf. see here.
  - As for the information in MBK, it is not traceable to individuals, cf. the MBK-rules No. 1030/2020. Art. 10 (Para 2).
  - In addition to the above, the processing of personal data shall be carried out in accordance with the Act on Data Protection and the Processing of Personal Data (No. 90/2018) and the Act on Processing of Personal Data for Law Enforcement Purposes (No. 75/2019). As also stipulated in Art. 98(Para 2), PSPs shall only obtain, process, and retain personal data necessary for the provision of their payment services, with the explicit consent of the payment service user.

- **Iceland’s data retention regulations are underpinned by the below-cites laws and rules**:
  - Payment service providers are under requirements in this respect cf. Act on Payment Services No. 114/2021 and also in Act. No. 161/2002 and need to comply with Act No. 90/2018 on Data Protection and the Processing of Personal Data that incorporates EU Regulation 2016/679 (GDPR) into Icelandic law. Art. 25 of the MBK-rules No. 1030/2020 requires participants to always have in place a reliable system for monitoring risk in connection with the use of the interbank system, which would include ensuring data retention. As for the MBK system itself, PFMI requirements would prevail.

- **The Central Bank of Iceland furthermore has proven contingency plans in place in case of a data security breach**.

Source: Central Bank of Iceland | Public Information
5.2 Risk Management

The Central Bank of Iceland has extensive contingency plans and a risk management framework that supports the reduction of risks related to the payment systems in Iceland. Moreover, Iceland has wide-ranging legal laws, rules, and regulations that support the reduction of risks.

- Iceland is a party to the Agreement on the European Economic Area (EEA Agreement) but the agreement was ratified in Iceland by Act No. 2/1993. Iceland’s Cybersecurity and data protection regulatory framework is therefore mainly based on EU’s regulatory framework i.e., the latter mentioned has been transposed into national law. In this context, the following may be mentioned (non-exhaustive):
  - Act No. 90/2018 on Data Protection and the Processing of Personal Data that incorporates EU Regulation 2016/679 (GDPR) into Icelandic law cf. Art. 2.
  - Act No. 114/2021 on Payment Services incorporating EU Dir. 2366/2015 (PSD2) numerous requirements both in respect to data protection and security issues (including cyber).
  - Act No. 161/2002 on Financial Undertakings w. later amendments, different provisions e.g., Art 60(a) stating that the processing and handling of personal data shall be in accordance with the aforementioned Act No. 90/2018. Also, Chapter IX on managing of risk factors in the operations of a financial undertaking including Art. 78(g) on operational risk (including cyber).
  - Act No. 78/20019 on Security of Net- and Information Systems of Critical Infrastructures (only available in Icelandic), implementing EU Dir. 2016/1148 (the NIS-directive).
  - The constituency of CERT-IS is by law a registered telecommunications provider in Iceland and serves as the national CSIRT for the Icelandic implementation of the implementation of the NIS directive and serves the ministries of the Icelandic government under the same law. In addition, CERT-IS serves as the national point of contact for cybersecurity-related incidents.
  - In addition, the criteria laid down in the BIS/IOSCO Core Principles for Financial Market Infrastructures (PFMIs) shall form the basis of the Central Bank’s oversight and operation of systemically important financial market infrastructures in Iceland. As for the MBK this is also stipulated in Article 31 of the aforementioned MBK-rules No. 1030/2020 and Art. 25 (Para 2) states that participants shall at all times have in place a reliable system for monitoring risk in connection with the use of the interbank system, including in respect to both data protection and Cybersecurity.
  - The technical operation of EXP is outsourced to Reiknistofa Bankanna (RB) which needs to comply with Annex F of the PFMIs. In this context, it should also be mentioned that EXP shall comply with the requirements in the BIS(CPMII)/IOSCO cyber guidance from 2016.
  - The CBI Financial Supervisory Authority has published its Supervisory Strategy for 2022-2024. Accordingly, Cyber- and IT security and anti-money laundering and terrorist financing measures are set forth as priorities.
  - The Central Bank of Iceland has taken a number of steps in order to safeguard against a cyber security attack, some include:
    - Disaster Recover site. The DR site provides the ability to ensure the continued operation of EXP in case of system failure or corruption.
    - EXP operates in an active/passive format at two data centers.
    - CBI has developed an in-house STIP solution (Stand In Processing) that can handle all the real-time payment traffic. This solution is used when the system has scheduled downtimes or in case of an emergency.
- The Central Bank of Iceland operates in accordance with the ISO/IEC 27001 international standards which is a standard to manage information security.
- The Central Bank of Iceland has published policies and procedures to enforce compliance with the standard.
5.3 Customer Complaints and dispute resolution

**Interbank Dispute Management**

- Disputes can be raised in two ways:
  1. Via email
  2. Via the helpdesk
- The process is further explained below:
  - The CBI helpdesk allows participants to log a dispute by sending an e-mail. The email once received will be automatically logged into the CBI JIRA tool. When CBI responds to the participant within the JIRA tool similarly an automatic email will be generated and sent out to the requestor.

**Customer Complaints**

- Customer complaints are received from customers of participants, these complaints are dealt with in the participant’s own system unless the complaint is a result of an error that occurred within MBK.
- Participants are required to have full customer complaint and dispute resolution systems with the associated processes in place.

**Change Management**

- A key objective of the Central Bank of Iceland is to facilitate the smooth functioning of the MBK infrastructure. With that CBI allows participants to raise change requests against the system.
- Although there is no automated change management system in place, there is in fact a change management process that is structured, transparent, and open.

**The Change Management Process:**

- A requestor may send a completed change request form to the Central Bank of Iceland.
- The request will be reviewed internally, and an impact analysis conducted by a special MBK committee. The requestor will be informed of the outcome of the evaluation.
- The EXP committee decides on a change request’s cost and impact and will additionally decide whether the requestor (individual participant) should pay for the whole request or if the request is a “whole industry” change request. Once decided, the CBI has a special change management process in place where it is evaluated if the said change will affect participants or not. If the change request does affect participants, there is a **UAT phase** required for the implementation.

Source: Central Bank of Iceland | Public Information
Chapter sections:

- 6.1. CSM

Chapter Summary:

- The Central Bank of Iceland (CBI) is the owner, regulator, and operator of the FPS.
- EXP is the system that is responsible for the processing of low-value payments in real time.
- Clearing and Settlement of transactions in EXP is achieved via a two-step process managed by two independent systems, EXP and the RTGS. Clearing happens in EXP subject to limits collateralized in the RTGS. Settlement is managed in the RTGS on a Deferred Net Settlement (DNS) basis via multiple settlement cycles within the RTGS’s business operating hours.
- The collateralized limits guarantee settlement thereby reducing the liquidity and settlement risk.
6.1 CSM Structure

- LVP transactions processed in MBK are cleared in real-time in EXP and the settlement of these transactions will occur in multiple daily settlement cycles.
- There are currently two settlement cycles per day.
- Clearing and settlement is a two-step process.

Transactions are cleared in real-time in EXP and the settlement of these transactions will occur in multiple daily settlement cycles. There are currently two settlement cycles per day. EXP is configurable, thereby allowing for additional settlement cycles.

Clearing and settlement is a two-step process:
- In step 1, EXP facilitates the continuous netting and clearing of transactions including the preparation of the final step of Settlement.
- Step 2, EXP leverages the interface to the RTGS for the actual resolutions of obligations resulting from the multilateral netting process and thus for the movement of funds between the RTGS Settlement Accounts which represents settlement finality.

Source: Central Bank of Iceland | Public Information