World Bank Project FASTT

Case Study: Türkiye

FAST (Instant and Continuous Transfer of Funds) | 2022

Payment Instruments

Credit Transfer

Use Cases / Services

P2P
Merchant Payment

Request to Pay
Escrow Overlay Service
# Glossary of terms

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<th>S.No.</th>
<th>Term</th>
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<tr>
<td>1</td>
<td>Easy Addressing</td>
<td>The proxy addressing overlay service that provides an easily remembered alias that can be used instead of account numbers in fund transfers (telephone number, e-mail address, TR Identity Number (TCKN), Tax Identification Number (VKN), Foreigner Identification Number, Passport Number)</td>
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<td>2</td>
<td>The Law</td>
<td>The Law on the Central Bank of the Republic of Turkey No. 1211</td>
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<td>3</td>
<td>GDP</td>
<td>Gross Domestic Product at current price</td>
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<td>4</td>
<td>Income Category</td>
<td>Classification as per World Bank based on Gross National Income (GNI) per capita</td>
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<td>5</td>
<td>Operator</td>
<td>Institutions responsible for the operation of the payment system</td>
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<td>6</td>
<td>Alias</td>
<td>Alternative to bank account numbers for increased convenience of the customer. For e.g., mobile number, national identification number</td>
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<td>7</td>
<td>Access Channels</td>
<td>Modes used by customer to initiate transaction on FPS. For e.g., branch, internet, mobile</td>
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<td>8</td>
<td>Individual Payment Type</td>
<td>Person to person (P2P) – Payment between individuals for non-business purposes</td>
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| 9     | Business Payment Type     | 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 |
| 10    | Government Payment Type   | Person/Business to Government (P/B2G) – Payment from person/Business to a government institution  
Government to Person/Business (G2P/B) – Payment from government institution to a person or business entity |
| 11    | Credit transfers          | Credit transfers are 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 |
### Abbreviations

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<td>BKM</td>
<td>Interbank Card Center</td>
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<td>2</td>
<td>CBRT</td>
<td>Central Bank of the Republic of Türkiye</td>
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<tr>
<td>3</td>
<td>TIC-RTGS (or EFT)</td>
<td>Electronic Funds Transfer – Both High and Low Value Payment Systems</td>
</tr>
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<td>4</td>
<td>FAST</td>
<td>Instant and Continuous Transfer of Funds</td>
</tr>
<tr>
<td>5</td>
<td>RPS</td>
<td>Turkish Lira Customer Payment System (Low Value Payment System)</td>
</tr>
<tr>
<td>6</td>
<td>BPS</td>
<td>Turkish Lira Interbank Payment System (High Value Payment System)</td>
</tr>
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Select Parameters

GDP
$819.04 billion

Income Category
Upper middle

Population
84.78 million

Access to mobile phone*
85%

Access to internet*
71%

Bank Account*
74%

Branches per 100,000 adult**
15.4

Made or received digital payment in last 1 year*
68%

Received government wages or transfer in account*
26%

* For age >15 years
**World Bank 2020
How to read this report

- This deep dive report relates to FAST in Türkiye
- It has been developed based on primary interviews with key stakeholders such as regulators, operators, and participants in the system as well as by leveraging secondary sources
- Key secondary sources include the CBRT website
- 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
A. Executive Summary

B. Detailed Report

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A. Executive Summary
**Instant and Continuous Transfer of Funds System (FAST)** is an instant payment system which operates on 24x7 basis in Türkiye, enabling credit transfers in Turkish Lira. It was developed in-house and is operated by the Central Bank of the Republic of Türkiye (CBRT).

- The design phase of the FAST started around the end of 2019. FAST launched in pilot mode in December 2020 and went live in January 2021. The whole process, from design to launch, took a bit more than 1 year.
- The CBRT is the owner, operator and overseer of the system.

**Key features of FAST are:**

- 24x7 availability
- Proprietary messaging format
- RTGS
- Overlay services
- Banks and non-banks direct participation

Users can choose between traditional and alternative channels for their transfers such as ATMs, branches, internet banking or mobile banking.

- Currently, FAST supports credit transfers for P2P and merchant payments.
- Overlay services include proxy addressing (Easy Addressing), QR Code payments and a Security Overlay Service. They are developed and operated by the Interbank Card Center (BKM), which is jointly owned by the CBRT and major commercial banks. Besides, developments on Request-to-Pay (RTP) and an Escrow Overlay Service are in progress. RTP requirements will be finalized in 2023 and the RTP service is planned to be launched shortly afterwards.
- QR code payments can be initiated either by P2P QR or merchant presented QR.
- Non-bank payment service providers are eligible to be direct participants in the system. None are participating for the time being, but some already applied and are expected to join in 2023.
B. Detailed Report
Chapter Summary

- **Instant and Continuous Transfer of Funds** (FAST) was launched in January 2021. FAST is complementary to RPS, a low value payment system owned and operated by the CBRT since 2012.
- Building FAST originates from a demand from end-users and banks, which requested longer opening hours for RPS: the CBRT took this opportunity to develop FAST, a new payment system serving as a base infrastructure for the payment ecosystem, enabling the making and collecting of payments anywhere, anytime, immediately and efficiently.
- FAST is considered vital for Türkiye’s less cash society goal and constitutes a complementary payment method to cash for purchasing goods and services.
- The CBRT’s strategy for the payment ecosystem is to create the appropriate environment and infrastructure, bolster value-added services, and make these services available to as many people as possible. **FAST is a crucial element of this strategy**, providing the foundational infrastructure over which other front-end services can be developed.
- FAST was **developed in-house** by the CBRT in around one year. Overlay services are commissioned to the operator of the card scheme in Türkiye, BKM, a non-profit company jointly owned by the CBRT and banks.
1.1 Background

The CBRT already owned and operated an efficient low value payment system, RPS, with an average execution time of 30 seconds. However, RPS lacked the main features of a modern immediate payment system. Participating banks in RPS demanded extending the operating hours of the RPS system. Aligned with the vision of achieving a less cash society, the CBRT decided to build a new immediate payment system providing an infrastructure that creates value for the consumers and includes overlay services, to serve as a complementary payment method for purchasing goods and services.

Payment systems operated by the CBRT:
The CBRT launched its first-generation real-time gross settlement system called TIC-RTGS in 1992 and renovated this initial system in 2000. The first and second generations had a wide range of usage, including wholesale interbank payments and retail payments settling in the very same system. In 2012, the CBRT redeveloped TIC-RTGS in-house as two separate RTGS systems for wholesale payments and retail payments, namely Turkish Lira Interbank Payment System (BPS) and Turkish Lira Customer Payment System (RPS). RPS is an efficient retail payment system with an average execution time of 30 seconds, executing ~4 million transactions/day. Since its launch, RPS has served well the participants (54 banks and the postal service), covering all account-to-account payment types (P2P, B2B, P2B, G2C, bills, etc.). However, though customers of participating banks of RPS receive payments within a minute on average, RPS relies on older technologies and had three major pain points: 1. it operates only on weekdays between 8.30-17.30, 2. there is no deadline for the payments to be completed as they can be queued in case of insufficient balance, 3. there is no obligation for the participants to notify their customers about the result of the operation.

Demand coming from the banks:
Türkiye has a modern and well-regulated banking system. The banking sector dominates the Turkish financial services, accounting for over 70 percent of overall financial services. Turkish banks are also the leading developers and users of fintech through the provision of advanced internet and mobile banking services, mobile wallets, cards equipped with state-of-the-art technologies such as EMV and NFC, as well as e-commerce solutions like virtual POS and soft POS. In 2019, the participating banks of RPS started demanding extending the operating hours of RPS. Some players even started to transfer money by opening corresponding accounts in different banks, which meant fragmented liquidity and inefficient operations.

Payments ecosystem:
Based on solid payment and banking systems and driven by innovative payment services and consumer needs fueled with mobile technologies, the payments landscape has evolved significantly in Türkiye over the last decade. However, cash is still dominant in retail transactions, together with credit cards largely used for merchant payments. Therefore, the CBRT decided to address the room for development in the payment ecosystem to reduce the use of cash and increase digital payments other than credit cards.

The decision to launch FAST:
One of the options for the CBRT to meet the demand was just to extend the operating hours of RPS. However, another option was to build a modern and immediate payment system addressing RPS’ pain points, with features such as 7x24 operating hours, instant availability of funds and instant end-to-end notifications. Aligned with the vision of helping the national goal of achieving a less cash society, the CBRT decided to build FAST, which constitutes a base infrastructure that creates value for consumers, includes overlay services, and serves as a complementary payment method to cash used for purchasing goods and services.
1.2 Objectives

- The goal of FAST is to help Türkiye achieve its less cash society goal.
- FAST is positioned as the base infrastructure over which value-added services are developed.
- To foster innovation and extend the reach of fast payments, non-bank direct participation is allowed (to payment institutions and e-money institutions) and open banking services will be launched shortly.

Vision

Making payment systems available for individuals and businesses everywhere, at any time and 24/7 is a key feature of modern transactions. One of the main goals of the launch of FAST is to help achieve Türkiye’s less cash society goal by providing an infrastructure and promoting a payment ecosystem that enables making and collecting payments anywhere, anytime, immediately, and efficiently.

Overlay services (by BKM)

- Easy Addressing
- QR Code Payments (TR-Karekod)
- Security Overlay Service
- Request to Pay (2023)
- Escrow Overlay Service (2023)

Nonbank access

- Allowing non-banks to participate in instant payments (2023)

Open Banking

- Allowing PSPs to manage accounts and initiate payments for customers (2023)

The CBRT’s strategy to promote innovation in the payment ecosystem is to create the appropriate environment and infrastructure, allow usage of value-added services and make these services widely available. FAST has been developed as the base infrastructure to achieve this strategy. Overlay services such as Easy Addressing, QR Payments and Request to Pay are added over FAST to create value for all parties, including participants and end-users. Furthermore, the CBRT aims to extend the reach of fast payments within the ecosystem by:

- Widening access through the direct participation of non-banks in FAST,
- Allowing open banking services, i.e. account management and payment initiation independently of the participants.

The CBRT considers interlinking FAST with other cross-border arrangements in the future, but only when domestic uptake will be deemed sufficient. The CBRT does not plan to develop a use case around government payments in the short-term. Government transactions are currently settled in RPS as they do not need to be processed in less than 25 seconds and on a 7x24 basis.
1.3 System Development

Development Process:

- Studies started with planning and analysis in December 2019.
- **World case studies benchmark and timeline projection** for implementing phases were made in order to identify technical, operational and legal requirements.
- **Three working groups (Liquidity, Operational and Technical)** were formed with internal and external partners to organize regular meetings, manage progress and exchange ideas in the process of development.
- A **design and communication strategy** was conceptualized.
- Meetings were held with **BKM**, a private entity owned by the CBRT and major Turkish banks, about overlay services.
- **End-to-end testing** was performed.
- Training and integration tests were conducted.

Implementation Process:

- FAST was launched in **pilot mode** with a few identified participants in December 2020.
- FAST went **live with full service** in January 2021 as an additional retail payment system.

**BKM**

BKM is the entity responsible for operating the card payment system in Türkiye. The CBRT is the major shareholder of BKM, alongside major commercial banks. Non-banks are also represented in the governance of the entity. Considering the knowledge of BKM in the end-user experience, the CBRT decided to work closely with them and to assign them the role of developing and operating overlay services of FAST, while the CBRT developed and maintained the instant payment system core structure. Such value-added services include Easy Addressing, QR payments, a Security Overlay Service, Request to Pay and an Escrow Overlay Service.

**FAST**

FAST was developed **in-house** by the CBRT. Overlay services of FAST are commissioned to the operator of the card schemes in Türkiye, BKM, a non-profit company jointly owned by the CBRT and banks.
1.4 Key Milestones

- Retail payment system - RPS (2012)
- Analysis & Planning of instant payment systems (2019)
- End-to-end test & Certification (2020)
- December FAST Pilot mode Easy Addressing Service
- January Live
- Transaction limit increase – 1,000 TL (2020)
- June Acceptance of non-banks’ application for FAST
- August Transaction limit increase – 2,000 TL (2021)
- August TR QR Code Regulation
- August Transaction limit increase – 2,000 TL (2021)
- February Transaction limit increase – 5,000 TL (2022)
- April Security Overlay Service
- 2022 Analysis & Planning for RTP and Escrow Overlay Service
- November QR Payment
  - Consumer presented
  - Merchant presented
2. Business and Operating Model

Chapter Sections
2.1 FPS Structure
2.2 Participants
2.3 Payment Instruments, Transaction Types
2.4 Access Channels, Agent Network and Aliases
2.5 Scheme Pricing and Fee Structure
2.6 Use Cases
2.7 User Adoption

Chapter Summary

- FAST was developed as a completely new payment system.
- The CBRT regulates, operates and oversees FAST.
- Direct participation is allowed for banks and non-bank PSPs.
- Credit transfers support both individual and merchant payments in Turkish Lira.
- Different access channels are allowed (ATM, branches, mobile banking, internet banking, QR Codes).
- All transfers up to the transaction limit identified by the CBRT are executed between participant accounts and comply with the Turkish IBAN standard.
- With the Easy Addressing, different aliases can be mapped to account numbers such as mobile phone number, ID number, e-mail address, tax ID or passport number.
- Depending on transaction amounts and use cases, different fees are charged to participants and an upper limit is set for end-user fees.
- P2P and merchant payments are already live. Request to Pay and the Escrow Overlay Service are in progress.
### 2.1 FPS Structure 1/2

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<th>Role</th>
<th>Responsibilities</th>
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<td><strong>Regulator and Overseer</strong></td>
<td>- The CBRT is responsible for ensuring the safety and stability of the financial system.</td>
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<td>- Determines the system participation and operation rules.</td>
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<td>- Decides fee structure related to the system.</td>
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<td>- Licenses payment and e-money institutions.</td>
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<td>- Facilitates the establishment of favorable conditions of competition between institutions and reduces the risks associated with the adoption of the system.</td>
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<tr>
<td><strong>Operator</strong></td>
<td>- The CBRT is responsible for conducting the day-to-day operations of FAST and defining the operating rules.</td>
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<td>- The CBRT operates the system by defining the rules such as business, technical, operational and security requirements, aiming to promote the functioning of the ecosystem.</td>
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<td></td>
<td>- The CBRT monitors operational risk indicators (availability index, number of failures and capacity utilization in real time settlement systems).</td>
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<tr>
<td></td>
<td>- The CBRT is the only operator of FAST. However, the operation of the overlay services is commissioned to BKM.</td>
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| **Participants**      | - Banks and non-banks that have establishment and operating licenses from the Banking Regulation and Supervision Agency and non-banks that have licenses issued by the CBRT (payment institutions and e-money institutions) are allowed to access FAST as direct participants, provided that they meet the technical and operational system requirements. There is no specific FAST license needed on top of these. |

- The CBRT is the regulator, **oversee and operator** of the system.

- Banks and non-bank PSPs can be **direct participant** of the system.
2.1 FPS Structure 2/2

- As other payment systems BPS and RPS, FAST is owned and operated by the CBRT.
- The settlement is made directly in central bank money, using the settlement accounts of direct participants in FAST.
- Integration with BPS facilitates liquidity transfer between RTGS systems.
- BKM develops and operates overlay services on FAST in cooperation with the CBRT.

**The CBRT** owns, operates and regulates FAST, BPS and RPS. The CBRT is responsible for the development, management, day-to-day operations, and maintenance of the systems. The settlement is made directly in central bank money using the settlement accounts of direct participants in FAST. **Integration with BPS** facilitates liquidity transfer between RTGS systems.

The CBRT opted for a balanced approach and aimed to benefit from the private sector’s experience to create value for the end-users. Thus, while the core infrastructure of the system is developed at the CBRT, the overlay services are commissioned to BKM.

BKM develops and operates overlay services over FAST in cooperation with the CBRT:
- Easy Addressing
- QR Code payments
- RTP service
- Security Overlay Service
- Escrow Overlay Service
2.2 Participants

The CBRT allows **direct participation** in FAST both for **banks** and **non-bank PSPs** that meet the technical and operational criteria and complete required tests successfully.

- **Participation and membership statistics**
  Only **banks** were allowed to participate in the system during the pilot mode (first 6 months of live). As stated in the FAST Operating Rules Document, **payment and e-money institutions** can apply for direct participation in FAST since **18 June 2021**. With the Decision of the Executive Committee, the "Procedures and Principles Regarding the Opening and Operation of Turkish Lira Deposit Accounts" was amended, making it possible to open a **settlement account** at the CBRT on behalf of payment institutions and e-money institutions that will participate in the FAST system. This account will need to be adequately prefunded by non-bank participants.
  - 23 **banking institutions** are active in FAST.
  - 29 **non-bank PSPs** have applied to participate (the assessment is in progress).

- **Onboarding process**
  Interested banks and non-banks must comply with the rules set by the CBRT to participate in FAST:
  - **Written application** with required documents,
  - **Assessment and approval of the applications** by the CBRT,
  - **Participation Agreement Document** signed by the applicant,
  - **Certification test** to verify the technical requirements.

  The onboarding process takes around five months, depending on the readiness of the applicant.

- **Requirements for Participants**
  - It is **not mandatory** to participate in FAST, but all major banks are involved in the initiative.
  - Participants need to **comply with legal, operational and technical requirements** that are mentioned in the Operating Rules Document to be eligible to participate.
  - **Official authorization** is needed to operate in a payment system as described in the **Law**. For non-banks, a license is also needed.
  - The **Participation Agreement Document** should be signed by the applicant.
2.3 Payment Instruments, Transaction Types

- FAST supports credit transfers between participating banks and non-banks (payment and e-money institutions).
- The transaction limit is currently 5,000 Turkish Lira, except for dynamic QR codes (10,000 TL).
- P2P and merchant payments are allowed.
- Request to Pay and an Escrow Overlay Service are planned to be available in 2023.

Payment Instrument Supported

- **Credit Transfer**
  - Account to account credit transfers are supported via different channels (ATMs, branches, mobile banking, internet banking, QR Codes).
  - Transfers between different banks and/or nonbanks.

Interoperability

- FAST is one of the payment systems owned and operated by the CBRT in addition to BPS and RPS. All the systems are independent. However, participants can transfer funds between FAST and BPS accounts in seconds.
- For P2P transactions, participants can transfer their customer’s payment messages either to FAST or RPS depending on the customer’s choice, transaction limit and payment type (whether it is urgent or not).

Payment Types and Use Cases

- **Individual**
  - Escrow Overlay Service
  - Request to Pay
- **Merchant Payments**

Transaction Limit

The CBRT gradually increases the P2P transaction limits of FAST:
- Initially – 250 TL
- Jan. 2021 – 500 TL
- Jan. 2021 – 1,000 TL
- Aug. 2021 – 2,000 TL
- Feb. 2022 – 5,000 TL

Transaction limit for dynamic QR merchant payments is 10,000 TL

Transaction Currency

FAST system allows for credit transfer only in Turkish Lira.
2.4 Access Channels and Aliases

- Channels for initiation of payments are mostly **mobile banking** and **internet banking** in FAST.
- Traditional channels (branches, ATMs) are also available for payment orders if participants offer them.
- Payments via scanning a **QR code** can be used both for P2P and P2M transactions.

**Aliases**

- In FAST, a payment order can be initiated by using an alias through the Easy Addressing overlay service operated by BKM, which relies on a centralized proxy database.
- Each alias is called an **easy address** that can take the form of **mobile phone number**, **e-mail address**, **national ID/tax ID**, or **passport number**.
- Registration is **not mandatory** to become a FAST user and each easy address matches only one account.
- One user can have at most **five easy addresses** linked to five different accounts.
- **Registered users** were **18.5 M** in September 2022.
- Participants are responsible for collecting and verifying the information before transmitting it to BKM.

**Access Channels**

- Channels for initiation of payments are mostly mobile banking and internet banking in FAST.
- Traditional channels (branches, ATMs) are also available for payment orders if participants offer them.
- Payments via scanning a QR code can be used both for P2P and P2M transactions.
2.5 Scheme Pricing and Fee Structure

Fees charged to participants by the CBRT
The fee is based on the transaction value:
- 0.20 TL for each transactions below or equal to 8000 TL
- 30.75 TL for transaction equal or above 1.23 million TL
- Between 8000 – 1.23m, the fee is based on a ratio which is 25TL out of a million TL of transaction value.
- There is no joining fee or annual fee for participants.

Fees charged to end-users by participants
Participants can charge their customers fees for account-to-account payments, but there is no fee for merchant payments. There are upper limits that can be charged based on the transaction value:
- Transactions below 1,000 TL can be charged maximum 1,56 TL.
- Transactions between 1,000 and 50,000 TL can be charged maximum 3,12 TL.
- Transactions valued or above 50,000 TL can be charged maximum 38,99 TL.

Interchange fee
For merchant payments, customers are not charged. There is an interchange fee (0.60%) that the acquirer must pay to the issuer.

Merchant discount rate (MDR)
For merchant payments, the maximum MDR is 1.08% of each transaction.
2.6 Use Cases/Services

### Merchant Payments

- **Payment Instrument**: Credit Transfer
- **Access Channels**: Mobile, Internet, QR
- **Pricing Scheme**:
  - Interchange fee and MDR for merchants
  - No fee for customers

Merchant payments are allowed in FAST through QR codes and Request to Pay services.

QR code standards were published in August 2021.

Merchants can produce both static and dynamic QR code for their point of sale and e-commerce transactions, in accordance with the standards.

### Request to Pay

- **Payment Instrument**: Credit Transfer
- **Access Channels**: Mobile, Internet, QR
- **Pricing Scheme**: No special pricing

Request to Pay is a value-added service based on the principle that the payee requests a payment from the payer, and the payer accepts this request to trigger the transaction in FAST. Request to Pay is a pre-payment messaging infrastructure, not a payment system or payment tool/channel.

Jointly with market players, BKM and the CBRT plan to identify requirements in the first half of 2023 and launch the service in the second half of 2023 for P2P transactions. The service has three main steps:

1. **Application**: payer and payee register at the FAST participant that offers the escrow service.
2. **Payment to escrow participant**: payer transfers the relevant amount to the FAST participant's escrow account.
3. **Payment to the payee**: the FAST participant that keeps the amount transfers the funds to the payee once the trade/delivery is completed.

This service is intended to be used for the sales of used cars and houses initially.

### Escrow Overlay Service

- **Payment Instrument**: Credit Transfer
- **Access Channels**: Mobile, Internet
- **Pricing Scheme**: In progress

The Escrow Overlay Service is an intermediary service that enables much higher transaction limits than P2P transactions. The payment amount is kept in the account of the FAST participant that offers escrow service until the service/product sale is completed, enabling an end-to-end secure transaction. The service has three main steps:

1. **Application**: payer and payee register at the FAST participant that offers the escrow service.
2. **Payment to escrow participant**: payer transfers the relevant amount to the FAST participant’s escrow account.
3. **Payment to the payee**: the FAST participant that keeps the amount transfers the funds to the payee once the trade/delivery is completed.

This service is intended to be used for the sales of used cars and houses initially.
2.7 User Adoption

FAST has seen an incremental growth, taking an encouraging share from retail payment transactions since its launch. It currently reaches a 5.9 million daily transaction volume, valued to 7.2 billion Turkish lira on average*. FAST processed the highest daily transaction volume of approximately 10.4 million payment orders valued to 38.4 billion TL in July 2022.

The uptake
Since its launch, FAST has demonstrated a rapid adoption rate driven by P2P transactions. One factor is the gradual increase in the transaction limit which increased the shift from RPS to FAST. However, the primary reason was the support from the participating banks which encouraged the use of FAST. The 18.5 million registrations in the Easy Addressing demonstrate the interest from customers. The CBRT considers interlinking FAST with other cross-border arrangements in the longer term, but only when domestic uptake will be considered satisfactory.

The Trend
The usage is expected to increase more in 2023 thanks to:
- Adoption of the open banking services
- Wide usage of QR Codes for merchant payments
- Nonbank PSPs participation
- Launch of the RTP overlay service
- Launch of the Escrow overlay service

Key user adoption highlights for FAST

- 18.5 million registration in Easy Addressing
- Average daily volume is 5.9 million*
- Gradual increase in transaction limit breaks down the natural barrier to all types of payments for all parties

* September 2022
3. Technical Details and Payment Process

Chapter Sections
3.1 Technical Details (Messaging Format, QR Codes, Customer Authentication)
3.2 Payment Process (Customer Registration, Transaction Fulfilment, Liquidity Management and Settlement)

Chapter Summary

- The CBRT developed an XML-based proprietary messaging format for FAST and is considering moving to ISO 20022 in the future.
- QR payments can be used for merchant and person-to-person payments, based on a national QR code standard.
- No unique registration guideline is published for customer registration: users can initiate payments via their banking channels.
- Settlements are real-time in FAST and liquidity management tools are provided to participants.
- Payment flows include exchange of messages between both parties and FAST, from the initiation to the completion of the transaction and notification to the end-user.
3.1 Technical Details (Messaging Format, QR Codes, Customer Authentication, APIs)

### Messaging Format
- Proprietary message type developed by the CBRT
- Message is based on XML format (similar structure to ISO 20022)
- Rich content and easy implementation/integration
- Ready to modify when needed

Participants were used to the proprietary XML messages used for the RPS, and as such, maintaining them for FAST removed the burden of changes for the FAST participants. There is a plan, though, to transition to ISO standards in the following years.

### QR Code Payment
- National QR code standard/FAST TR QR code Rules & Principles
- Compatibility with EMVco Standards
- Static/Dynamic, Long/Short, P2P/P2M
- Mobile, online and point-of-sale payments supported
- 91% of ATMs and 65% of POS terminals compatible with QR code use cases (November 2022)

**Static QR** Codes can be used for more than one transaction, have a fixed content and generally contain account information.

**Dynamic QR** Codes are generated uniquely for each individual payment. Transaction specific data are compulsory inside the QR. It can only be used for a single transaction, preferably in a very short expiration period.

### Customer Authentication
- All participants are required to authenticate the account and transaction information of the payment message before the funds are transferred.
- Customers are interacting with the FAST system through the participant’s applications (mobile, web, etc.). Each participant has its own customer authentication standards adhering to the Participation Agreement of FAST.
- Each participant is required to join a closed network through a specific ISP vendor’s data line and routers, defined by the CBRT in order to reach FAST and APIs. Participants that are connected to FAST are also required to authenticate in the system via authentication credentials and digital signatures.

### APIs
- FAST provides APIs only for querying information and reporting to the participant. Payment-related message communications are handled through the AMQP protocol and messaging queues. Open banking APIs are also under discussion but are outside of the scope of FAST.
3.2 Payment Process (Customer Registration, Liquidity Management and Settlement)

**Customer Registration**

Customers can initiate the payment order by logging in their payment service provider’s banking channel. There is no direct login system to FAST for end-users. Registration for Easy Addressing is conducted in real time via customers’ payment service providers online environment but is not mandatory to carry out a FAST transaction.

**Settlement**

All participants are directly connected to the system. Transactions are generally completed in less than one second in FAST. Settlement takes place through a real-time gross settlement mechanism.

**Liquidity Management**

Participants can transfer liquidity between their different RTGS accounts (BPS, FAST) to manage their balances. Participants decide how much liquidity to have in their FAST accounts (e.g. for holidays) and the CBRT does not interfere with their decisions. End of day balances are counted in reserve requirements calculations as an incentive to keep a high level of liquidity in FAST. This incentive has been efficient so far, as banks keep high amounts in their settlement accounts. Participants can also borrow liquidity from each other directly in FAST, via bilateral agreements. The CBRT does not intervene in the process or define borrowing rates.
3.2 Payment Process (Transaction Fulfilment)

- Completely new payment system infrastructure.
- Proprietary messaging format.
- Initiating channels for payments can be mobile banking, internet banking, ATMs, branches.
- Notification to end user is a requirement for participants.

Participants connect directly to the system.
Overlay services include Easy Addressing, QR payments, Request to Pay, Security Overlay Service and Escrow Overlay Service.

### Successful Payment Flow

1. Remitter can initiate the payment order in three ways:
   1. Providing the beneficiary’s account details (IBAN and account name) to the sending participant as the traditional method.
   2. Scanning the beneficiary account’s QR code by using the sending participant's application.
   3. Using an alias mapped to the beneficiary account details. If an alias is used, sending participant must query the central Proxy database to get the account details.

2. After required checks, sending participant creates and sends instant payment messages to the System by debiting the remitter’s account. System validates the message and then concurrently routes it to receiving participant by putting the message in the reservation queue.

3. Receiving participant sends an acceptance message to the System when it gets the order. System receives the acceptance message, settles the transaction and sends confirmation messages to both participants. After settlement, sending and receiving participants notify their customers about the transaction result.

Timeout process starts for a message if it is not settled in 25 seconds.
3.2 Payment Process (TR QR code used for P2M transaction in FAST)

1. The consumer starts the process by stating that s/he wants to pay via TR QR code.
2. Generate TR QR code.
3. Scan the TR QR code.
   3a. Check the payment account and confirm.
   3b. Check the payment account and confirm.
4. Send the payment message.
5. Validate and settle the payment.
7. Print the receipt/slip.

TR QR code is a national standard for QR code data organization that has been developed in order to ensure interoperability among the actors of the payments ecosystem, by creating a common language with common rules and specifications, to foster innovative initiatives and thus to contribute to the goal of a less cash society. Merchant presented QR codes are already available, and customer presented QR codes are under development. Merchants have the possibility of creating one single QR code for different payment instruments.

Merchant Presented TR QR code-based payments enable consumers to make purchases using a merchant generated QR code, through their PSP. It is displayed on the merchant’s device – in most cases the payment terminal – containing payment and merchant’s account details. The consumer scans this QR code through their application, checks the details, confirms it and initiates the transaction through their PSP.

The consumer’s PSP prepares and sends the payment message to the FAST system (if the merchant’s PSP is not itself, i.e. not on-us transaction) using the information in the QR code after validating the payment details and checking the consumer account for sufficient balance.

FAST ensure settlement and sends the notifications to both the merchant and the consumer through their PSPs. Note that the merchant’s PSP, which is the generator of the QR code, validates the QR code content as a part of the FAST’s instant message confirmation.
3.2 Payment Process (TR QR code used for P2P transaction in FAST)

1. Generate TR QR code
2. Scan QR
3. Initiate fund transfer
4. Send the payment
5. Validate and settle the payment
6a. Notification
6a. Notification

The payee makes available his/her account information in a TR QR code to the payer, to carry out a person-to-person fund transfer.

1-3 The payee’s PSP generates TR QR code containing the payee’s account information. The payee then shows the QR code to the payer. The payer scans the QR code, checks the account details and then initiates the fund transfer.

4 The payer’s PSP sends the payment message to FAST (if the payee’s PSP is not itself, i.e. not on-us transaction) using the information in QR code, after validating the payment details and checking the payer’s account for sufficient balance.

5-6 FAST makes the settlement and sends the notifications to both the payee and the payer through their PSPs.

Successful TR QR code payment flow
3.2 Payment Process (FAST transaction via payment initiation providers – in progress)

FAST payments, either TR QR code initiated or not, can also come through open banking APIs.

Licensed TPPs, which could either be banks or non-bank institutions, will be allowed to provide their customers Account Information Services and Payment Initiation Services via APIs provided by Account Servicing Payment Service Providers (ASPSP), which could also be either banks or non-banks. The ASPSPs provide APIs via BKM’s Shared Open Banking Platform called BKM API Gateway.

In the payment initiation flow, the consumer logs in his/her TPP account and selects his/her debiting account via its IBAN. Then, the consumer mentions the IBAN of the payee (the merchant), is informed about the transfer details and is subsequently directed to the ASPSP screen for the authentication.

The consumer is subject to Strong Customer Authentication (SCA) on the ASPSP side. On successful authentication, the transaction is completed in accordance with ASPSP’s current SCA flows. Then, the consumer is redirected to the TPP’s screen.

The fund transfer could be either on-us or interbank transfer. In case of interbank transfer, payment initiation transactions can be forwarded to the FAST System. API standards are compatible with FAST transfers and straight through message flow is achieved from consumer to merchant.

The fund transfer is presented on the consumer’s screen, and the consumer can save the debited and/or payee account information for subsequent money transfers at his/her discretion.
4. Governance Framework

Chapter Sections
4.1 Legal and Regulatory Aspects
4.2 Risk Management
4.3 Dispute Resolution and Customer Complaints

Chapter Summary

• **The Law on the Central Bank of the Republic of Türkiye No. 1211** and the **Law on Payment and Securities Settlement Systems, Payment Services and Electronic Money Institutions** provide the legal basis for FAST.
• Other regulatory documents about operational rules, technical details, duties and responsibilities are also published based on these laws.
• The CBRT is the owner and the operator of the system.
• **Dispute resolution guidelines** are defined in regulatory documents (FAST System Operating Rules, FAST System Participation Agreement Document).
• **Customer complaints** are resolved according to the participants’ own procedures.
The Law on the Central Bank of the Republic of Türkiye No. 1211 regulates the duties and responsibilities of the CBRT. The Law on Payment and Securities Settlement Systems, Payment Services and Electronic Money Institutions regulates the procedures and principles regarding payment and securities settlement systems, payment services, payment institutions and electronic money institutions, and empowers the CBRT in this area.

The FAST System Participation Agreement regulates the relations between the CBRT and the system participants, the rights and obligations of the parties and other issues regarding the operation of the system.

The FAST System Operating Rules have been prepared on the basis of Article 4 of the Central Bank of Türkiye Law No. 1211 from 1970, Article 4 of the Law on Payment and Securities Settlement Systems, Payment Services and Electronic Money Institutions from 2013 and numbered 6493, and Article 7 of the Regulation on the Operations of Payment and Securities Settlement Systems, published in the Official Gazette, from 2014 and numbered 29044. The purpose of FAST System Operating Rules is to determine the general rules regarding the operation of FAST and the infrastructure used, as well as the rights and obligations of the parties. The FAST System Operating Rules cover FAST, its participants and the CBRT.

The FAST System Reference Document describes the operational and technical details for the implementation of the rules contained in the FAST System Operating Rules. The purpose of the FAST System Business Continuity Implementation Plan is to prepare action plans on the basis of critical processes of the CBRT for emergency scenarios within the scope of FAST.

Communique On The International Bank Account Number establishes the principles and procedures regarding the implementation of the International Bank Account Number by payment service providers. According to this Communique it is mandatory to validate and use the beneficiary’s IBAN for money transfers made through FAST.

Regulation On The Generation and The Use Of The TR QR Code In Payment Services, dated August 2021, regulates the procedures and principles regarding the generation and use of the TR QR code in payment services.
The CBRT is the sole developer, owner, operator and regulator of FAST. Different divisions of the CBRT are involved in the functioning of FAST and development of new features. BKM is appointed to develop and operate overlay services with the CBRT.
4.2 Risk Management

All participants are required to ensure the necessary precautions for fraud detection for FAST transactions. The application and gradual increase of the upper limit was designed as a means of monitoring and control mechanism for fraud. There are different limits for transaction types in order to prevent fraud cases. P2B payments initiated with dynamic QR code and escrow payments with a special reference number have higher transaction limits than others, since they have an extra verification procedure. The Security Overlay Service is planned to be a data center for fraud cases enabling participants to report fraud cases and inquire the transactions they see risky in reported cases.

Transactions in FAST are executed on an RTGS basis. Payments are not executed in cases where the balance of the participant is insufficient. Therefore, failure of a participant to fulfill its obligations does not pose a credit risk to the CBRT or to other participants.

Participants are allowed to control and manage their balances instantly in the system. They can follow the transactions and transfer funds between RTGS systems of the CBRT. Moreover, end of the day balances of the participants are counted as reserve requirements. Therefore, the liquidity risk is low for FAST.

All participants are responsible to meet the responsibilities described in the FAST System Participation Agreement to eliminate the operational risks (e.g. BCP, performance tests, disaster recovery tests, scalable and redundant IT infrastructure, private network).

All system participants are obliged to comply with cyber resilience and security related rules in the legislation. Test scenarios before participation and emergency scenarios after participation are compulsory for all.

The system provides the infrastructure needed for AML regulations and all participants should perform AML/CFT checks.
4.3 Dispute Resolution and Customer Complaints

Dispute Resolution

The methods to be applied in the resolution of disputes are regulated in the FAST System Participation Agreement and FAST System Operating Rules.

Any dispute that may arise between the system participants regarding the operation of the system is first tried to be resolved by consensus in accordance with the procedure specified in the Operating Rules.

In the event of a dispute between the participants and the CBRT regarding the functioning of FAST, the parties shall determine their arbitrator to form a Dispute Resolution Board. The Board immediately presents a copy of the detailed decision to the CBRT when the case is resolved.

Customer Complaints

All duties and responsibilities are defined in regulatory documents and guidelines for participants. There is no standard guideline for customer complaints resolution published by the CBRT.

Customer complaints should be resolved by participants in accordance with the regulation and rules.
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<td>FAST payment flow</td>
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5.1 Key Features

### Key Highlights

<table>
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<tr>
<th>Feature</th>
<th>Details</th>
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<tr>
<td>Operating Hours</td>
<td>24<em>7</em>365</td>
</tr>
<tr>
<td>Payment Speed</td>
<td>Real-time ~ 1 second (Timeout after 25 seconds)</td>
</tr>
<tr>
<td>Transaction Limit</td>
<td>5,000 ₺ per transaction – 10,000 ₺ for dynamic QR merchant payments</td>
</tr>
<tr>
<td>Alias</td>
<td>Mobile phone number, e-mail address, National ID/Tax ID, Passport number</td>
</tr>
<tr>
<td>Channel</td>
<td>Branch, ATM, Mobile Banking, Internet Banking, QR</td>
</tr>
<tr>
<td>User Charges</td>
<td>Upper limit is set by the CBRT</td>
</tr>
<tr>
<td>Infrastructure Setup</td>
<td>New System</td>
</tr>
<tr>
<td>Messaging Format</td>
<td>Proprietary Messaging Format</td>
</tr>
<tr>
<td>Use of Open APIs</td>
<td>Not available for payment related messages but only for querying and reporting</td>
</tr>
<tr>
<td>Authentication</td>
<td>No standard for customer authentication</td>
</tr>
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### Payment Types & Use Cases/ Services

- **Individual**
  - Merchant Payments
  - Cross-border Payments
  - Recurring Payments
  - Request To Pay

- **Business**
  - Bulk/Batch Payments

- **Government**
  - Bill Payments

### Settlement

- **Approach**: Hub, RTGS, Distributed Clearing
- **Type/Time**: Real Time | Immediate Settlement
5.2 Statistics of FAST

- Number of Participants: 23
- Daily Average Volume*: 6.4M
- Daily Average Value*: ¥7.4B
- Registered users: 18.7M
- End to End Processing Time*: 0.33sec
- Rejection Ratio (over all payments): 2%
- Timeout Ratio (over all payments): 0.1%

RPS 3.7 M transaction 37%
FAST 6.09 M transaction 37%

*Oct 2022
5.3 RPS Payment Flow

**Turkish Lira Customer Payment System** (RPS) is a retail payment system operated by the CBRT, preexisting to FAST. RPS has an average execution time of 30 seconds, executing ~4 million transactions per day. RPS covers all account-to-account payment types (P2P, B2B, P2B, G2C, bills, etc.).

Payments are queued in case of insufficient balance.
5.4 FAST Payment Flow

- **Timeout:** If the time between sending participant send the payment to FAST and the payment settled exceeds 25 seconds, timeout process starts.

- **Receiving Participant Obligation:** Receiving participant is obliged to complete validation in 15 seconds.