

Position Paper
Centrale Bank van Aruba

Roadmap towards a modern payment infrastructure in Aruba



A highly knowledgeable
and well-prepared
community will be able to
safely surf the new waves
of disruption



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The purpose of this document is to outline the current state of the payment infrastructure of Aruba and to identify stakeholders and their positions within the payments landscape. Furthermore, it outlines the need and potential benefits of implementing a new payment infrastructure. Finally, it will determine the factors that should be considered in such a future state. This position paper is issued by the Centrale Bank van Aruba.



CENTRALE BANK VAN ARUBA



The international financial landscape is undergoing major transformation through extreme digitalization and connectivity

1. Purpose

In a fast changing digital world, wherein real-time is the new normal, users expect payments to be processed as instantly as sending a message via a mobile device. Due to legacy systems and complex interdependencies between participants, the implementation of a new, faster and secure payment infrastructure is challenging, yet nevertheless pivotal to financial stability and economic development.

Payment infrastructures are moving from being a narrow channel for transferring funds to a much wider integrated network for transferring additional forms of value. The creation of networks and systems for payments can have a substantial role in supporting financial access and inclusiveness in countries. They are being used to integrate the previously non-served and underserved population into the formal financial sector.

A well-functioning infrastructure to efficiently and safely process modern payment instruments is necessary to successfully enhance access to those instruments, as well as to accelerate the use and development of new payment methods and solutions.

If we translate this to the current Aruban payment infrastructure, it is clearly fragmented, inefficient and lacks innovation.

The goal of this position paper is to combine the views and positions of the various stakeholders with regard to the current payment infrastructure and more importantly, provide a forward-looking value proposition for transforming Aruba's payment infrastructure.

The presented roadmap outlines the Aruban payment infrastructure requirements, such as standardization, a simplified clearing and settlement solution, increased transparency, openness and reduced costs for all users. Finally, it should stimulate local e-commerce and create a state-of-the-art payment rail that can facilitate the Aruban payment needs for the coming decade.

Key challenges in Aruba's payment infrastructure

Innovation

Transparency

Efficiency

Leadership



2. What led to this paper

The Centrale Bank van Aruba (hereafter CBA) adopted a 5-year strategic plan, 'Bela Yen, Nos Plan Strategico 2016 - 2020' (hereafter Bela Yen). One of the goals of this plan is to modernize the payment infrastructure in order to enhance efficiency, credibility and security. Its modernization will raise the standard to a level in line with the prevailing international best practices.

In November 2016, De Nederlandsche Bank (hereafter DNB) and the CBA performed a Fact Finding Mission (hereafter FFM) to identify gaps in the current infrastructure and to gain insight into the steps towards achieving the ambition as stated in Bela Yen. The FFM consisted of interviews with important stakeholders (banks, money transfer companies, authorities and clients) and resulted in a clear set of items that need to be improved in order to achieve the goals of Bela Yen.

The most important observations from the FFM are used as input for this position paper. The plan moving forward is to review comparable use cases that have been implemented across the globe and to gain insights into the wide range of possibilities, requirements and limitations of state-of-the-art solutions. Based on the optimal solution for Aruba, a roadmap will be designed that will guide the CBA in the implementation process towards a future-proof solution.

High-level timeline of what led to this paper

2016	November 2016
Bela Yen, Nos Plan Strategico A 5-year strategic plan for the CBA (2016 - 2020). One of the main goals in this plan is the modernization of the payment system to enhance efficiency, credibility and security to a level in accordance with the prevailing international best practices.	Fact Finding Mission - DNB De Nederlandsche Bank together with the CBA have conducted a gap analysis to gain insight into the steps towards achieving the Bela Yen ambitions.



▮▮ The international financial landscape is undergoing a major transformation through extreme digitalization and connectivity. Several countries are now on the forefront to implement much needed study to be able to understand the impacts hereof and what best policies to adopt.

By now we all realize that Aruba's financial sector will not be isolated from this wave of technological change that has no frontiers. It is unstoppable. If we quickly move to adopt the right financial innovation and accordingly revamp our educational system, there will be many winners. If not, there will be losers. ▮▮

Jeanette R. Semeleer, President of the Centrale Bank van Aruba, November 11, 2016.
Speech delivered during the Conference on Financial Technology and the Future of Money.

April 2017	November 2017 (1)	November 2017 (2)	2018 onwards
Internal CBA developments Based on the preliminary results of the Fact Finding Mission, the CBA started internal discussions and analyzed the options to privatize the current clearing system and enhance the payment system development.	Publication FFM Publication of the results of the Fact Finding Mission to the main stakeholders.	Publication Position Paper The CBA's vision on Aruba's payment infrastructure will be described in this position paper. The goal of this paper is to inform all the stakeholders of the current state, as well as focus on possible solutions to improve the current payments landscape.	The way forward Facilitating a modern payment infrastructure in Aruba, based on international best practices, as well as introducing laws and regulations.

3. Current state

Aruba's payments infrastructure overview

Oversight	Regulation	Currently, there is no institution in Aruba that has the mandate to regulate current or future payment infrastructure and solutions
	Users	<div>Public entities</div> <div>Government</div> <div>FI's</div> <div>Merchants</div> <div>Non-bank FI's</div> <div>Consumers</div>
Payment instruments	Channels	<div>Internet</div> <div>Branch</div> <div>ATM</div> <div>Mobile</div> <div>Payment terminals</div>
	Payment rails	<div>CBA Clearing</div> <div>CashNet</div> <div>MasterCard</div>
Payment rails	Transaction types	<div> <ul style="list-style-type: none"> ▶ Credit Transactions ▶ Direct Credit Transactions ▶ Direct Debit Transactions </div> <div> <ul style="list-style-type: none"> ▶ Direct Credit Transactions ▶ Credit Card Transactions ▶ Direct Debit Transactions ▶ Checks ▶ ATM </div> <div> <ul style="list-style-type: none"> ▶ Direct Credit Transactions ▶ Credit Card Transactions ▶ Direct Debit Transactions ▶ Checks ▶ ATM </div>
	Infrastructure provider	<div>Centrale Bank van Aruba</div> <div>Four commercial banks</div> <div>One commercial bank</div>



Stakeholder observed opportunities on current state

Innovation	<ul style="list-style-type: none"> ▶ Strong consensus on modernizing the current payment system ▶ A collaborative platform is preferred by all stakeholders ▶ Integral part of 'Product Aruba'
Transparency	<ul style="list-style-type: none"> ▶ Transparency of fees and international (cross-border) transactions ▶ Transparent 'rules of the system' (e.g., account opening) ▶ Transparency of settlement times
Efficiency	<ul style="list-style-type: none"> ▶ Increased standardization & integration ▶ Lower transaction costs & shorter settlement time (clearing) ▶ Digitalization of payment processing
Leadership	<ul style="list-style-type: none"> ▶ Shared Leadership ▶ Facilitated by the CBA (expansion current legal mandate) ▶ Creation of a National Payment Platform

Aruba became an autonomous country within the Kingdom of the Netherlands in 1986. Since then, it has its own currency, the Aruban Florin, which is unilaterally pegged to the USD at a rate of Afl. 1.79. Due to the large number of American tourists and the significant trade with the U.S., the USD is also commonly used.

Taking into account the results from the FFM, as well as when comparing Aruba to other countries, the current payment infrastructure lacks the following key elements:

- ▶ Innovation: the payment infrastructure has outdated systems and products
- ▶ Transparency: in costs and settlement time
- ▶ Efficiency: in standardization, costs, settlement time and digitalization
- ▶ Leadership: lack of leadership and collaboration in development of payment systems, conducting to a fragmented market

This chapter consists of four paragraphs in which the position of the main stakeholders is elaborated upon:

- ▶ 3.1. Users of the payment infrastructure
- ▶ 3.2. Service Providers
- ▶ 3.3. Processors and position CBA
- ▶ 3.4. Authorities

The current outdated payment infrastructure hinders the spending of inhabitants and tourists, as well as international trade. But more importantly, in the long run - if left unchanged - it could impact financial stability, economic development and economic growth.



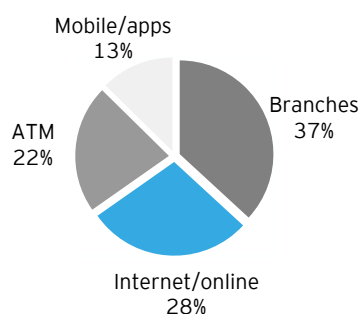


3.1. Users of the payment infrastructure

Clients and end-users of the payment infrastructure are private customers, companies and government institutions. Aruba's population counts over 110,000 inhabitants and it is visited by approximately 1.8 million tourists each year.

The main payment instruments are cash, credit- and debit cards and checks. Every commercial bank in Aruba issues Point of Sale (POS) terminals (hereafter payment terminals). The commercial banks prefer use of issued debit cards solely on their own payment terminals and usage hereof with another bank's terminal may result in additional fees for the merchant and/or consumer. As a result, merchants are forced to provide multiple terminals to consumers, resulting in higher costs and dissatisfaction to both the client and the merchant. This fragmentation is not common in modern economies.

Channels used in Aruba to communicate with banks



As already mentioned, the florin is the local currency. Shops, bars and restaurants accept the florin, as well as the USD. Also, depending on the card holder's residency, most ATM's provide the option to withdraw both currencies.

Checks are still a popular payment instrument in Aruba. However, the processing of checks is very labor intensive for banks and it does not provide an efficient payment experience for the consumer either. Therefore, discouraging check usage - and at the same time providing alternative payment methods - will help reduce operational costs and create momentum to move from the use of checks to modern payment methods.

Aruba has between 4,000 - 5,000 payment terminals, which are owned by the banks. Early 2017, one commercial bank introduced contactless payment terminals (hereafter Near Field Communication or NFC). Other commercial banks are also looking at the opportunities offered by NFC terminals and are already preparing debit cards for this transition.

The most used payment methods by tourists are Europay, MasterCard and Visa.

Mobile banking via applications is slowly becoming more common in Aruba. More than 85% of the Aruban population have an internet connection, more than 95% have a mobile phone and 65% have access to computers. All commercial banks offer their clients the possibility to use mobile applications for their banking needs. However, the adoption rate of these applications is still low.

Current research shows that almost 75% of the Aruban population have a bank account. The banks offer a wide range of types of accounts, such as the standard checking and saving accounts, as well as student, salary, young professional and 60+ accounts.

Several utility providers still allow clients to pay their subscriptions by cash or via payment terminals through their main offices or via the banks. A commonly accepted direct debit solution would save a lot of operational handling, improve transaction times, reduce uncertainty of payments and - thereby - enhance transparency.

Main Challenge

The main reason provided for the lack of adoption of alternative payment instruments is the unwillingness of clients to do so. A large group of the population is still under-served, even though they have access to a bank account. Old-fashioned payment methods, including the use of cash and checks, are still widespread and preferred. However, the pressure to innovate payments is growing amongst a new generation of consumers and merchants, who are increasingly demanding faster and more efficient payment systems, especially for conducting online business.

3.2. Service providers

The Aruban banking landscape consists of 15 bank branches and over 95 ATM's. The market is divided between five commercial banks, being:

- ▶ Caribbean Mercantile Bank (CMB)
- ▶ Aruba Bank (AB)
- ▶ RBC Royal Bank (RBC)
- ▶ Banco di Caribe (BdC)
- ▶ CIBC First Caribbean International Bank (CIBC)

Most banks have parent companies in either Curacao or Canada. This could lead to additional complications in the standardization of the Aruban payment landscape, as the banks might have different technical requirements and ambitions for change.

In addition to the banks, there are currently two money transfer companies servicing the market. According to the experience of the money transfer companies, most transactions are being sent from Aruba to recipients around the rest of the world, instead of funds being received in Aruba from abroad.

There is limited collaboration between the financial service providers, resulting in inefficiencies and high transaction costs. The differences between service providers are, amongst others, visible in (diversity of) reporting standards, the structure of transaction costs and bank account numbers.

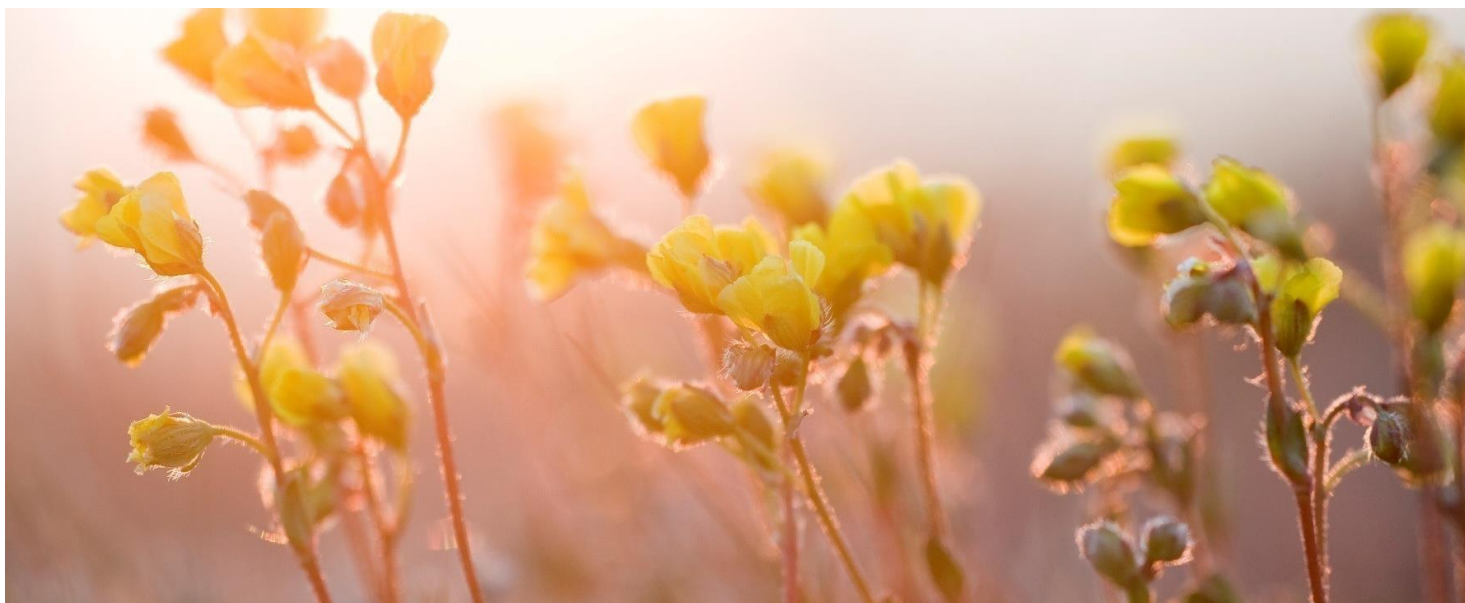
The need for standardization and innovation of the Aruban payment landscape and for the internal changes within the commercial banks is expected to pose challenges to modernize the payment infrastructure.

The potential benefits for the service providers, as well as others, are expected to be significant:

- ▶ Higher adoption rate of alternative or innovative payment methods by the local community, as well as visitors.
- ▶ Easier and higher spending of tourists.
- ▶ Reduction of old-fashioned and expensive traditional payment methods.

Main Challenge

One of the main challenges in modernizing the Aruban payment infrastructure is the lack of economies of scale. Aruba has approximately 110,000 inhabitants - and over 1.8 million tourists on an annual basis -, who are mostly serviced by the five commercial banks. Stakeholders requested to invest in a new payment solution should have a solid business plan for the required investments.



3.3. Processors and position CBA

In the Aruban payment infrastructure, three different payment rails are currently being used:

- ▶ Clearing system operated by the CBA for interbank settlements
- ▶ MasterCard, which is used by one bank
- ▶ CashNet, which is used by four banks

The CBA clearing system does not separate private and business clients, as this was not deemed necessary during the introduction of this system. The clearing software dates from 1997 and was updated during the years. However, the functionality is still roughly the same. This system is a low value/high volume system and operates according to NACHA standards. It processes credit transfers, direct debit wires and credit wires, such as salary and pension payments. The clearing system does not process debit and credit card transactions.


The clearing and settlement function is currently executed by the Operations Department of the CBA. The Operations Department processes the direct credit files (salary, pension and tax returns) and direct debit files (standing orders from the utility companies) separately from regular transactions. These files are processed twice daily by the CBA for further processing between the clearing members. Transfer times between the clearing members are unclear and can take up to 3 to 5 days. International payments may even take 7 to 10 days before being cleared.

Channels used in Aruba to communicate with banks

- ▶ The 5 commercial banks
- ▶ Directie Financiën (Department of Finance)
- ▶ Departamento di Impuesto (Aruban Tax Authority)
- ▶ Stichting Algemeen Pensioenfonds Aruba (the civil servants pension fund)
- ▶ WEB N.V. (water company)
- ▶ ELMAR N.V. (electricity company)
- ▶ SETAR N.V. (telecommunications company)

The main tasks of the CBA are:

- ▶ Determine the monetary policy
- ▶ Supervise the financial system
- ▶ Issue florin bank notes and florin coins on behalf of the government
- ▶ Regulate the flow of international payments, manage the available foreign exchange reserves of Aruba and supervise the spending thereof
- ▶ Act as banker to the government



The current legal mandate of the CBA is too limited to implement the ambitious changes as set out in Bela Yen. In order to ensure that all objectives can be met, the CBA is, amongst others, in the process of proposing an amendment to the Central Bank Ordinance to introduce a regulatory mandate for the payments system.

Main Challenge

The three current payment rails communicate with different standards and formats. In order to align these payment rails to one system, the communication of IT platforms - the backbone of all banks - needs to be standardized.

3.4. Authorities

The CBA acts as the banker for the government of Aruba. There are arrangements in place between the Department of Finance and the CBA with regards to payments.

Until recently, the current payment infrastructure has not been a main discussion point in the public sector. Developments with regard to e-commerce are driving also the need to provide innovative payment solutions.

One fourth of all payments that pass through the CBA's clearing system are of government origin. This entails tax payments, payment of civil servants, non-tax receipts, profit distributions and payments of salaries for public servants.

In the meantime, there is a high need for innovation on the island, including that for enhancing the payment system, bringing it up to par with advanced economies.

Main Challenge

There is currently no clear leadership in the Aruban payment infrastructure. The CBA has no mandate to regulate the payment system, neither does any other institution on the island.





4. Challenges

With its ambition to modernize the payment system, the CBA is facing various challenges. These challenges arise from different angles and can have a technical, financial, timing or legal character or a combination hereof. In the following overview, the four main challenges that should be taken into consideration while modernizing the payment infrastructure, are specified.

Users

User unwillingness to adopt or adapt

The main reason provided for the lack of adoption of alternative payment instruments is the unwillingness of clients to do so. A large group of the population is still under-served, even though they have access to a bank account. Old-fashioned payment methods, including the use of cash and checks, are still widespread and preferred. However, the pressure to innovate payments is growing amongst a new generation of consumers and merchants, who are increasingly demanding faster and more efficient payment systems, especially for conducting online business.

Banks

Lack of economies of scale

One of the main challenges in modernizing the Aruban payment infrastructure is the lack of economies of scale. Aruba has approximately 110,000 inhabitants - and over 1.8 million tourists on an annual basis -, who are mostly serviced by the five commercial banks. Stakeholders requested to invest in a new payment solution should have a solid business plan for the required investments.

Processors

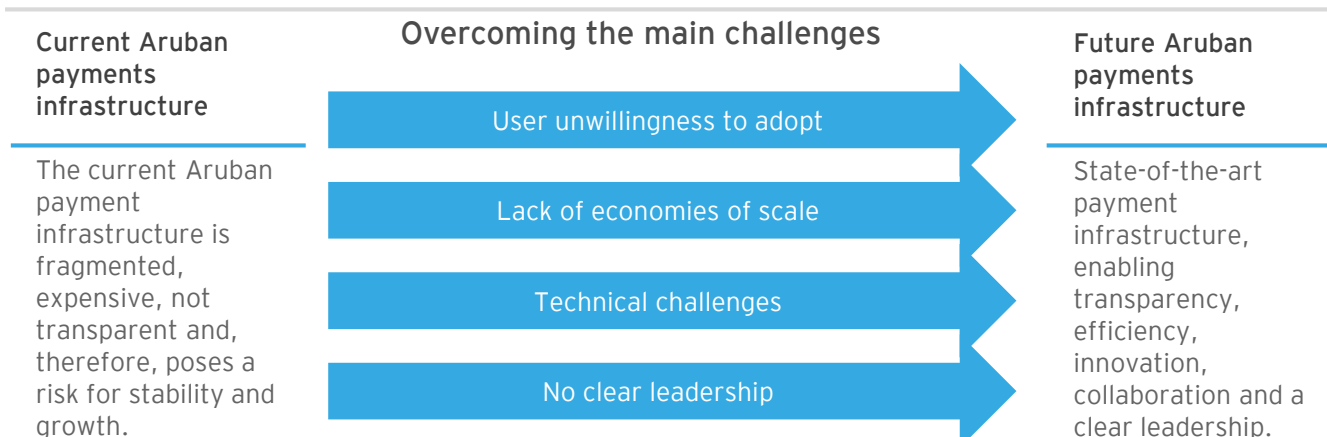
Technical challenges

The three current payment rails communicate with different standards and formats. In order to align these payment rails to one system, the communication of IT platforms - the backbone of all banks - needs to be standardized.

Authorities

No clear leadership

There is currently no clear leadership in the Aruban payment infrastructure. The CBA has no mandate to regulate the payment system, neither does any other institution on the island.



5. Requirements

A new, fully redesigned payment infrastructure is beneficial to all stakeholders of Aruba's payment landscape. It is best adopted by its users if the solution applied adds value in the domains of operational excellence, product leadership and customer experience. The discipline of innovation leaders in payment infrastructure resides at the intersection of these core value propositions.



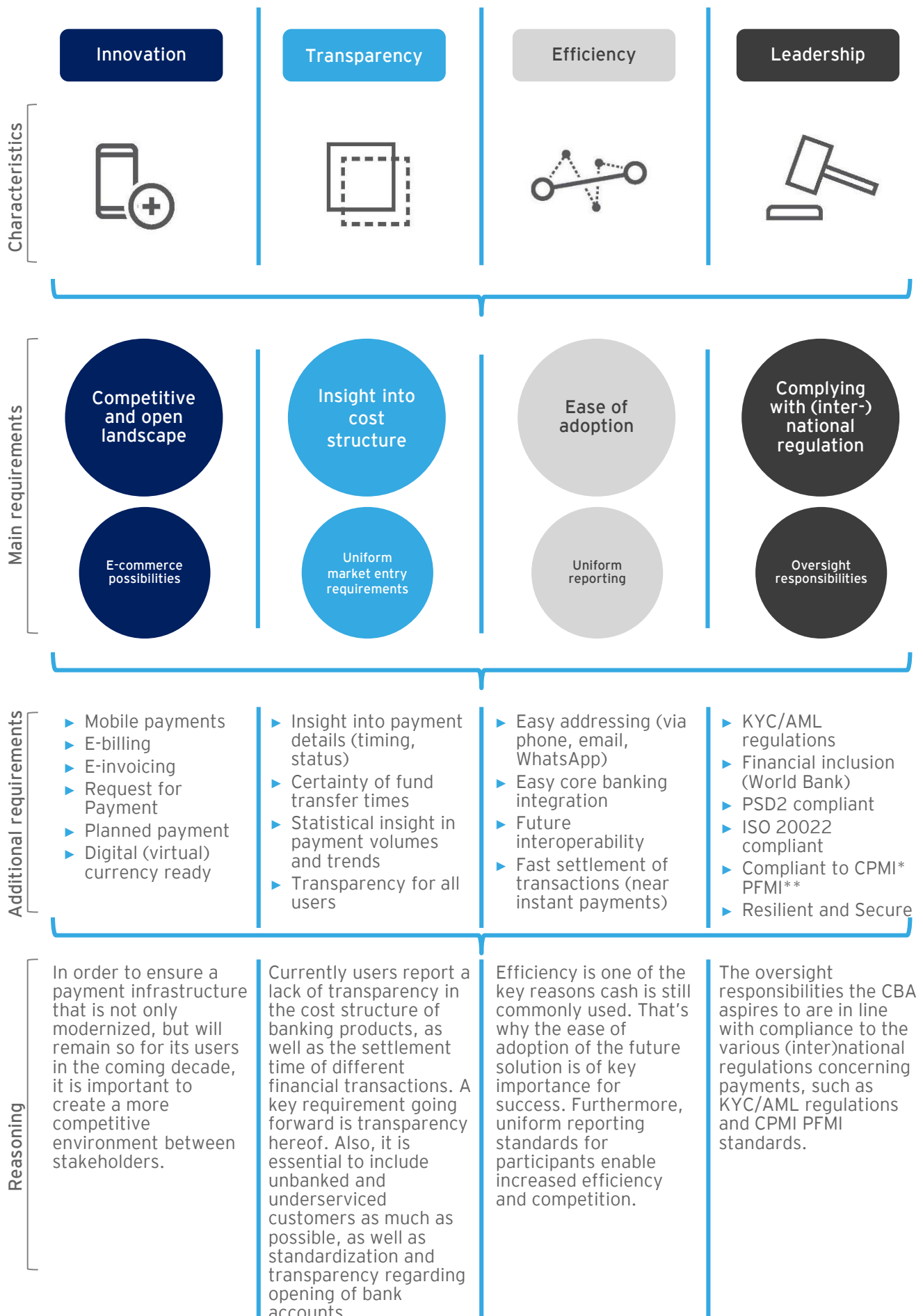
The users of the payment infrastructure will value the solution if it meets the following requirements:

- ▶ Fast, the usability should be as quick as (near) real-time, which is in line with international developments.
- ▶ Free, the solution should be significantly cheaper and workable for the users than the current payment rails and also free of hassle.
- ▶ Flexible, for innovations to be quickly adopted and for the users to be able to change service providers, if so desired.
- ▶ Fair, the costs and fees involved should be transparent to consumers and merchants and all participants should be treated fairly.
- ▶ Future-proof, as to ensure that the infrastructure in place is safe and secure and ready for the coming decade.

In defining the requirements, attention has been given to the main concerns that were presented in the FFM: innovation, transparency, efficiency and leadership. This is shown in more detail on the next page. The two circles depicted on the next page display the main requirements per key area, the largest being the most important per area of concern in the future state.

Per area of concern, several additional requirements have been identified. Some of the requirements are perceived as critical, for example regulations that need to be in place, while others are nice-to-have and are of less critical importance in a modernized payment infrastructure.

The payment community acknowledges that there is no single world-leading payment infrastructure currently in place. Rather, there are specific systems within various countries that have world-leading attributes in terms of superior speed, functionality and benefits to users. However, even these specific systems are being challenged by new developments initiated by both FinTechs and traditional payment providers, such as banks. Therefore, we have a great challenge before us to incorporate the best of the best into Aruba's modernized payment infrastructure.



*CPMI: Committee on Payments and Market Infrastructures
 **PFMI: Principals for Financial Market Infrastructures

6. Vision and ambitions of the CBA

The implemented end state solution should leapfrog Aruba's payment infrastructure into the front runner in the Caribbean. The modernized payment infrastructure should be beneficial to all participants and stakeholders in order to become a success.

That also means that this solution should be relatively easy to adopt by the Aruban community. Whether one is from the younger or older generation, tech-savvy or non-tech savvy, banked, under-banked or under-served, it should not matter, as long as the modernized payment system is beneficial to all.

CBA's ambition is to act as initiator, motivator and investor initially. Ultimately, the payment infrastructure should fall under the responsibility of market actors, which allows the CBA to take a regulatory oversight role. This regulatory role should be legally assigned to the CBA in order to enable it to effectively carry out its responsibilities in this area. To this end, the CBA is in the process of setting up a Payment System Department, as well as drafting an amendment to the Central Bank Ordinance expanding the mandate to include oversight on the payment system and a state ordinance regulating the payment system.

Three high-level ambitions of the CBA:

- 1 Leapfrog the state of Aruba's payment infrastructure**
The ambition set by the CBA is to upgrade the Aruban payment infrastructure and to leapfrog it into a Caribbean frontrunner.
- 2 Beneficial to all stakeholders**
All stakeholders/users of the Aruban payment infrastructure must benefit from the modernized payment system.
- 3 CBA has an oversight role**
The CBA plans to reduce its current operational responsibilities with regard to the clearing system and in exchange will take on an oversight role of the modernized payment system.



7. Exploring the future

For the desired future state of the payment system in Aruba, market developments and financial technologies, such as Blockchain, Mobile as NFC-device, Mobile as payment, SMS-based transfers, Bluetooth payments, e-commerce developments and many others belong to potential solutions that have to be explored. Furthermore, the transformation of financial institutions through data analytics, artificial intelligence and open banking is a development that should be taken into consideration, which can offer multi-beneficial opportunities for a modernized payment system.

Based on the high-level requirements as set out in this position paper, in the coming months an extensive analysis will be conducted to determine the best fit, in order to leapfrog the state of Aruba's payment infrastructure into a Caribbean frontrunner.

Some of the most recent developments are described concisely below. These are examples used for illustration purposes only and in no way are meant to depict CBA's preference. The characteristics of the best and most realistic solutions should be combined in order to find the best fit to modernize Aruba's payment system.



Instant Payments, real time, 24/7 payments. Born from the need for a faster alternative to the existing ACH processing systems.

Open Banking, by adopting Open Banking, banks publish API's or connectors to encourage third parties to develop new offerings for their customers.

Cybersecurity, innovation is shaping the payment field, creating new vulnerabilities to existing and new technologies. Constant action is required to prevent payment fraud.

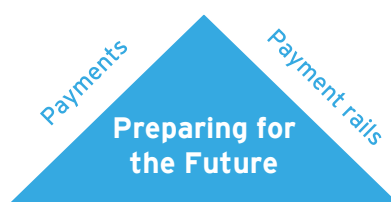
PSD2, an EU-directive to integrate and standardize payment services to the customer. Supporting transparency and competition.

Payment Architecture landscape, pressure from regulation, technology advancements, competition and customer demands drive both incremental and innovative improvement.

Distributed Ledger Technology, a quickly developing and highly investigated technology by banks around the world.

SWIFT Next Gen, SWIFT's global payment innovation offers new functions such as the option to recall payments, enrich transactions and makes space for Blockchain cross-border settlement.

Internet of Things, over 34 billion devices will be connected by 2020. Internet of Things will support a total spending of USD ~300bn in 2020 (Forbes, BCG). Responses from the payment ecosystem will be required.



Some examples of innovation

M-PESA, a mobile phone-based money transfer and financing system, launched by Vodafone. The service allows payment via PIN-secured SMS-messages.

Poynt Smart terminal, a state-of-the-art terminal, accepting all traditional and innovative payment solutions. Poynt is a wireless, dual touchscreen, smart terminal that allows businesses to accept payments anywhere.

PromptPay, an initiative of the Bank of Thailand which facilitates easier and cheaper interbank mobile payments. It facilitates the easy transfer of funds through the recipients phone number, Citizen or Tax ID.

Central Bank backed cryptocurrencies, several Central Banks around the world are investigating the feasibility of a cryptocurrency variant of their fiat currency.

8. Envisioned way forward

Current	Publication of a position paper that combines the views and positions of all stakeholders in the current Aruban payments landscape and outlines the requirements for a future state payment system in Aruba.
Nov '17	Use case analysis that will focus on comparable challenges in other countries, as well as their solutions, while taking market best practices into consideration.
Jan '18	Based on the information from the position paper, the use case analysis and other researched information, a desired solution will be selected. A roadmap for the implementation of this solution will be created.
2018	The ambition is to start with the implementation of Aruba's new payment infrastructure halfway 2018.
2019	The first benefits of the implementation of the new Aruban payment infrastructure should be realized in 2019, depending on the scope and method of implementation.
2020	Depending on the final solution, its impact and requirements, the ambition is to have a fully modernized payment infrastructure in place by 2020.