The IPN Hub

Exploring its utility beyond pay-as-you-go solar

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GSMA Mobile Money

About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with over 350 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

For more information, please visit the GSMA corporate website at www.gsma.com

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The GSMA's Mobile Money programme works to accelerate the development of the mobile money ecosystem for the underserved.

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Introduction

The Instant Payment Notification (IPN) Hub is an **industry utility** created by the GSMA to enable ecosystem players to connect more easily to mobile money providers – bringing fundamental utility services (such as electricity, water and sanitation) to off-grid populations.

After demonstrating the value of the IPN Hub for the **PAYG (pay as you go) solar sector**, we are now exploring how the hub may support more players and more use cases. This spotlight on the IPN hub aims to encourage other sectors to explore the usability of its service.

A spotlight on the IPN Hub

Why the IPN Hub was needed

Mobile money can unlock new models of energy services because, as an industry with almost 700 million accounts, and a presence in two-thirds of the world's low- and middle-income countries (Sub-Saharan Africa and South Asia accounting for the bulk of accounts), mobile money is strong in the very regions where the need for PAYG solutions is greatest. Thus, mobile money makes it possible for PAYG solar providers to make digital collection of funds from customers over time. A customer can buy a small solar home system with only a down payment and pay the rest over an agreed upon period using their preferred mobile money service, turning on the electricity as needed. By providing a compelling use case for mobile money, PAYG providers are driving mobile money penetration and usage, increasing brand loyalty, and contributing to revenues.

Despite this obvious synergy, PAYG players and mobile money providers have not yet realised its full potential. One of the biggest reasons for this is the need for service providers to undergo a complex integration with each mobile operator to receive instant notification of payments from their customers. It is not uncommon for an integration between a PAYG provider and an operator to take months to complete, and the cost of time and resources dedicated to the process is high.

Prompted by this context, the Instant Payment Notification (IPN) Hub was created by the GSMA to connect multiple mobile money payments providers and PAYG utility providers through a single integration – resolving these time-consuming and costly challenges of multiple technical integrations. The hub ensures that the PAYG service provider receives an **instant notification** of any payment made by their customers using mobile money, so the customer can turn on the utility, such as a light, instantly. It is therefore appropriately titled the Instant Payment Notification (IPN) Hub.

While the hub offers limited functionality and only passes on information linked to payments (i.e. notification of payments, not payments themselves), its ability to provide this functionality across a **large geographical footprint** is one of its unique strengths.

Figure 1

Illustrative image showing how the IPN Hub can connect key players in the PAYG and Mobile Money sectors through a single integration.

Technical architecture of the IPN Hub

1 Figure 2 shows the typical payment notification use case of the IPN Hub. The sequence of events starts with a mobile money customer initiating a payment to a PAYG service provider through the interface provided by their mobile money provider (*Initiate Payment*) - usually a USSD menu and the Pay Bill (or equivalent) option.

2 The mobile money provider then sends a notification via the IPN Hub of the customer's intended payment to the PAYG service provider (*1. Payment Request*). Most often in the industry today, a Pay Bill relationship only offers periodic or manual reconciliation, whereas the IPN Hub facilitates a real-time communication between the mobile money platform and the PAYG provider.

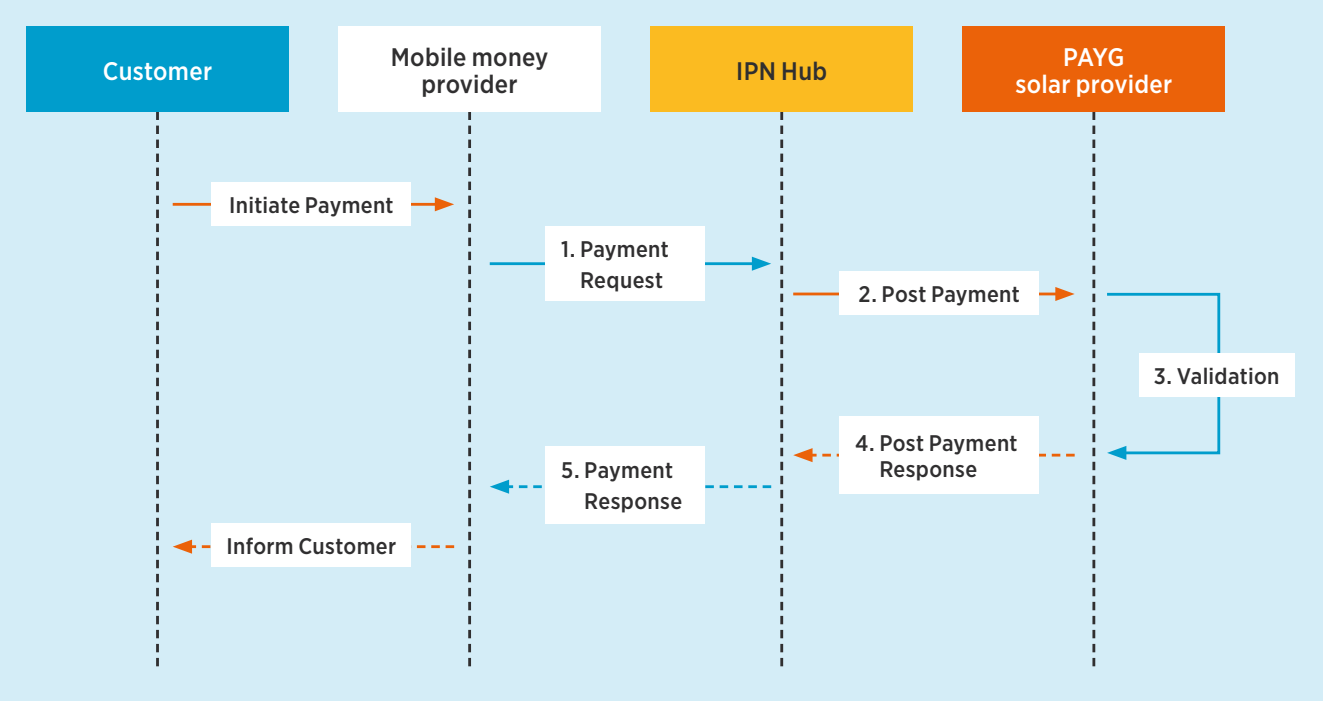
3 Next, the IPN Hub relays that notification to the PAYG service provider (*2. Post Payment*), who then validates whether the payment request is from one of their registered customers to avoid the possibility of erroneous payments (*3. Validation*).

4 Once the validation stage is complete, the PAYG service provider immediately provides the customer with the service they have paid for, and initiates a notification to the customer confirming their payment has been received, and that their account has been credited with the payment (*4. Post Payment response, 5. Payments Response, and 6. Inform Customer*).

5 While the IPN Hub was conceived as a solution specifically for the PAYG solar sector, its functionality could also support service providers in other industries that share the need to receive instant notifications of customer payments. This allows the service provider to respond immediately with a product or service their customer has purchased, reducing lag time and thus enhacing the customer's experience of the service offering.

Figure 2

A typical payment notification use case of the IPN Hub



The impact of the IPN Hub to date

The IPN Hub is **currently live in Rwanda** and connects two leading PAYG solar providers (BBoxx and Off Grid Electric) and the two mobile money providers in the market (MTN Rwanda and Airtel-Tigo).

Since the hub went live in December 2016, it has processed notifications for **over 1.5 million unique payment transactions**, supporting the PAYG solar sector in Rwanda to provide up to 100,000 households with life-changing clean energy.

Testimonies received from a diverse set of stakeholders, including mobile operators, service providers and end users of PAYG solar services, indicate that the hub has had a positive impact in a number of ways, including smoother integrations for service providers and reduced manual work for both operators and service providers.

Figure 3

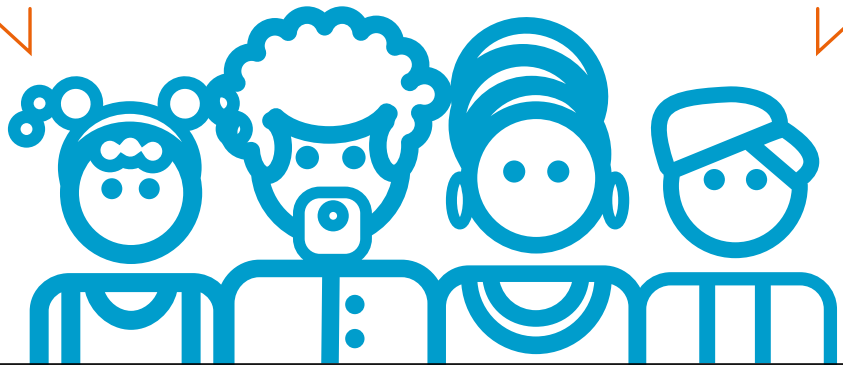
Key stakeholder feedback

"The IPN Hub has reduced the amount of time taken to supply energy to a customer from 2+ hours to 3 minutes."

"It now takes just a few minutes to receive energy. My family is no longer vulnerable to snakebites in the dark".

"With the IPN Hub, we can connect to multiple service providers at once. It has also improved the end user experience."

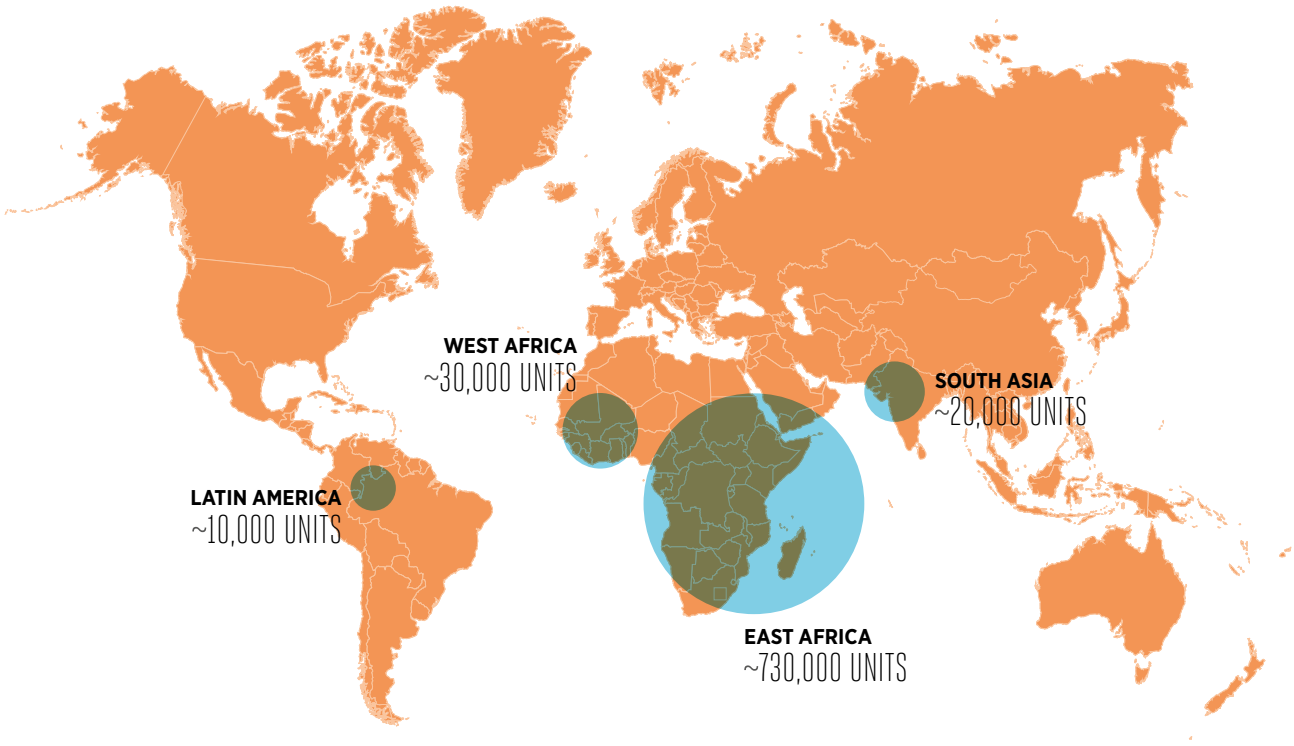
"It is much smoother to connect to operators via the IPN Hub than directly."



The IPN Hub has **also expanded geographically**. While it continues to thrive in Rwanda, the hub is now available in Uganda, Nigeria and Kenya, and will soon enable several PAYG service providers to receive instant notification of mobile money payments in these markets. There are also plans to expand the hub to Tanzania, Mozambique, Zambia, Senegal, Malawi and Mali among other markets, in line with the growing demands of the PAYG solar industry.

Figure 3

IPN Hub expansion plan



Relevance of the IPN hub beyond PAYG solar

Many players in the mobile money ecosystem have a PAYG business model

The IPN Hub was intentionally designed as a simple and easily replicable solution. The hub can support PAYG service providers to **quickly scale in a new market** by providing an existing technical integration to receive instant notification of payments from multiple mobile money and payments providers.

After acquiring mobile money merchant accounts from mobile money providers, service providers can utilise the existing technical integration between the mobile money providers and the IPN Hub to receive instant notifications of payments. This will save them the hassle of integrating with each mobile money provider individually, which can take months to complete and requires significant resources. The process of connecting to the IPN Hub for service providers is by integrating through an easy-to-use API.

In the mobile money ecosystem, there are a **number of services beyond PAYG solar** that follow a pay-as-you-go business model, and can similarly benefit from the seamless single-point integration and instant notification of payments that the IPN Hub provides, or from the ease of entering new markets without technical integrations being a barrier to getting started.

Water, sanitation and school fees payments are some examples of services in emerging markets which often utilise a PAYG model. The IPN Hub can provide them with an easy way to integrate with mobile money providers and receive notifications of payments made by their customers in real time.

Another sector which may benefit from the IPN Hub functionality is the transport sector. Similarly to players in the PAYG solar sector, some transport providers may have a need for receiving instant notification of payments made to them in order to initiate or complete the provision of a service. This could be the case particularly for transport providers whose customers use prepaid wallets to access their services, which is often the case in mass transport systems. There may also be some transport use cases where a real-time payment needs to be initiated by a customer towards the service provider. In both of these instances, the IPN Hub could be useful for transport players.

How could a transport company benefit from the IPN Hub's functionality?

Let us explore this further with the help of a hypothetical transport company – a mass transport bus service whose customer tops up a prepaid wallet and uses an NFC tag to pay for a ride when boarding a bus.

In this scenario, the customer would top up their pre-paid wallet with the bus company (using the USSD menu of their mobile money provider).

The IPN Hub would enable the bus company's system to be updated in real time confirming that a top up has been carried out, and the customer's wallet would be updated instantly.

This would allow the customer to board the bus immediately after topping up their wallet, rather than waiting for reconciliation between their mobile money provider and transport provider. Upon boarding the bus, the customer would wave their NFC tag in front of the sensor and undertake the journey.

Even if the customer boarded the bus and waved their NFC tag in front of the sensor, only to realise that it was short of funds, they could top up immediately as described above with the help of the IPN Hub in order to undertake their journey.

The IPN Hub is one part of the solution for industry players

The above spotlight offers only a generic example of how a real-time notification of a customer-initiated payment can support a transport provider. It assumes that the company does not have an interface directly with the customer, via an app or their own USSD menu, which would otherwise allow them to know when a customer initiated a payment. In reality, many transport players need to have an interface directly with customers, to facilitate ride-hailing for example, making the IPN Hub less likely to alleviate the integration issues they would face with providers.

There are several other elements required to support their business, such as commercial contracts, SMS functionality to connect with customers, reconciliation services and other bespoke features. The IPN Hub is not designed to be a complete solution for all the needs of a service provider; rather, it must be **complemented by other services** to collectively meet service providers' needs. That said, for providers struggling with connectivity to the mobile money industry, the IPN Hub can be an important component to start their business.

Service providers who require an expanded set of payment functionalities and wish to integrate the IPN Hub into their interface - whether apps, web or their own USSD menus - should seek out payments APIs from mobile money providers or intermediaries. The GSMA, in conjunction with wider industry stakeholders, has created a specification known as the GSMA Mobile Money APIs. It aims to reduce integration costs and increase accessibility to payments APIs (see box below).

Specifications of the GSMA Mobile Money APIs

The GSMA Mobile Money APIs aim to address the complexity and fragmentation that is apparent in the fast-growing, bottom-up mobile money industry.

The APIs have been designed to cater for a core set of mobile money use cases, including:

- Merchant payments, online and offline, including delegated authentication of transactions
- Bill payments and instant notification of payment
- Bulk transactions
- Interoperability between mobile money and banks, or among mobile money providers
- International transfers, including request for quotation
- Basic account management
- Cash in / Cash out

The APIs were jointly designed by key stakeholders - mobile money providers, platform vendors, third party service providers and industry partners - and combine best practices in the technology industry.

The GSMA is encouraging its members and mobile money industry partners to raise the bar by using these APIs to ensure rapid partner onboarding, to offer advanced and secure functionality, and to reduce the fragmentation that limits and delays regional partners from leveraging mobile money.

The GSMA Mobile Money team is working with mobile money providers, platform vendors and third party service providers to ensure adoption. So far the APIs are in use by industry players in Asia, Africa and Latin America. Hackathons have taken place to further promote awareness and adoption of the APIs in Tanzania, Pakistan and Rwanda.

Conclusion and next steps

There are a diversity of industries and businesses that can innovate and benefit from collecting customer payments using mobile money. There are many **different types of service providers**, and each of these service providers can have very different business models and subsequent payments-related needs relating to notification, processing, authentication and reconciliation.

The IPN Hub is not designed to meet all the payments needs of ecosystem players. However, even with its simple functionality, **the hub can help to meet one of the core needs of service providers**, as shown in the table below:

SERVICE PROVIDER NEED	DESCRIPTION	CAN THE IPN HUB MEET IT?
Integration and notification of payments (without initiating payment)	The need to be connected with multiple payment service providers, through a single integration, to receive instant notification of payments made by customers using the interface of the mobile money or payments provider to initiate a payment to them.	**YES**
Transacting and processing (e.g. initiating payments)	The need for other payment-related flows that are necessary for their business (e.g. the need to pay drivers for a taxi company or to debit an amount from a mobile money account after a journey has taken place).	**NO** (Payment API integration required)

The IPN Hub can thus be a useful part of the solution for many service providers and can add value particularly when a 'traditional' customer initiates remote payment (which would benefit from an instant notification). This may especially be the case for an early-entry service provider. However, for more sophisticated needs, the IPN Hub may not be the right solution.

After having demonstrated the value of the IPN Hub for the PAYG solar sector, we are now exploring how the hub may evolve to support even more players. To this end, we are **working closely with a number of companies to understand their perspectives** and how the IPN Hub should evolve to support the needs of their sector. Please join us in this endeavour to make the mobile money industry more accessible and useful for a variety of industries. If you are interested in using the IPN Hub for your business, please get in touch.

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