

# Mobile Technologies for the SDGs

How start-ups and mobile operators in emerging markets are leveraging USSD technology to address socio-economic challenges



EXTRACT FROM: [START-UPS AND MOBILE IN EMERGING MARKETS](#)

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Of the 3.7 billion people not yet connected to the internet, 2.5 billion (two-thirds) actually live in areas that are covered by 3G or 4G signals<sup>1</sup>. This means that coverage is not the only obstacle. Some of the major barriers include the cost of mobile data and smartphone ownership (despite the price dropping significantly) as well as the lack of digital literacy and content relevance for potential users.

To circumvent these limitations, technology start-ups looking to target a broader audience are looking beyond internet-based means.

USSD is one of the channels enabling start-ups to reach almost anyone. The technology has been used in emerging markets for more than a decade and is sometimes considered to be the 'ancestor' of mobile apps.

Based on data gathered from more than 550 start-ups that applied in July of 2017 to the second round

of the GSMA Ecosystem Accelerator Innovation Fund, **one in five start-ups across Africa and Asia Pacific are leveraging USSD technology to meet their customers' needs**. Some of these start-ups use USSD as their sole communication channel, while others are adopting hybrid approaches that combine web, SMS, USSD and/or IVR.

The relevance and importance of USSD in emerging markets have attracted the attention of internet corporations such as Facebook, Twitter and Google. These companies have worked with local mobile operators to enable emerging markets users to have access to their internet-based services without the need for internet-enabled phones. For instance, several mobile operators offer their users access to Facebook through USSD. Using this service, users can view their news feed and update or like a status without having to connect to the internet and all at very little cost.

FIGURE 1

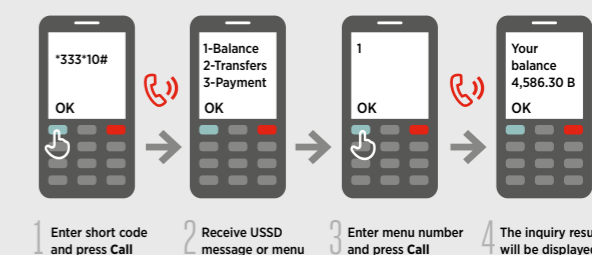
## What is USSD?

Patented in 1994, the USSD technology, or Unstructured Supplementary Service Data, is an interactive, menu-based technology, which is supported on most mobile devices.

USSD messages can be up to 182 alphanumeric characters long. USSD is similar to SMS in that it sends short text-based messages; however, instead of text messages going from user to user, USSD messages travel from the user to the mobile network or vice versa. USSD creates a real-time connection, which allows for a two-way exchange of data between users and the network. This makes the technology more responsive than SMS. Also, like SMS, USSD works on standard phones, feature phones and smartphones without the need to install any app or programme, or access to mobile data.

## How it works

'Self-care' (users checking their airtime credit balance) is one of the most common use cases of USSD. Users typically dial a short code on their phone, for example, #123\*, and get access to a menu where they can check their airtime balance and other options.













Beyond the technology giants, emerging market start-ups are also using USSD technology. Launched in 2012, [Hoppr](#) (India) a mobile device-agnostic

location-based check-in service was initially a USSD-only service. The start-up set out to build a hyper local e-commerce ecosystem in India, where users are able to explore offers available with brands and merchants in their vicinity via USSD. Within just six months of operation, Hoppr had garnered 65 million check-ins, three million registrations and over a million active users<sup>2</sup>. After reaching critical mass on the USSD platform, Hoppr adopted a hybrid approach by launching an Android app to expand its addressable market to customers with internet services. Hoppr was later acquired by Hike and has since been integrated into the Indian instant messaging platform<sup>3</sup>.

<sup>1</sup> Source: GSMA Global Mobile Trends 2017, <https://www.gsmainelligence.com/research/?file=3df1b7d57b1e63a0cbc3d585feb82dc2&download>  
<sup>2</sup> <https://techcrunch.com/2013/03/09/as-it-hits-3m-users-after-6-months-hoppr-checks-in-its-bid-to-be-indias-foursquare/>  
<sup>3</sup> <http://economictimes.indiatimes.com/tech/software/hike-brings-hoppr-tiny-moqui-games-under-main-brand/articleshow/48466977.cms>

# Start-ups, USSD technology and the Sustainable Development Goals (SDGs)

The examples below highlight start-ups across emerging markets that are utilising USSD technology as a tool to effect positive socio-economic change in their respective operations.

SDGs	START-UPS	
 <p><b>1 NO POVERTY</b></p>	<p><b>CashUp (India):</b> The Fintech start-up runs a USSD-based money transfer platform that allows users to make direct bank to bank transfers. It is available in three languages - English, Hindi and Tamil.</p>	
 <p><b>2 ZERO HUNGER</b></p>	<p><b>MLouma (Senegal):</b> The agtech platform connects farmers to customers by displaying real-time market prices and localisation. The solution is built on Orange's SMS and USSD platform (#303# My Store), as well as a web application. Farmers can subscribe directly by dialling a USSD code.</p>	
 <p><b>3 GOOD HEALTH AND WELL-BEING</b></p>	<p><b>GiftedMom (Cameroon):</b> The start-up offers health information and monitoring services to pregnant women in marginalised communities through USSD, SMS and a web application. <b>GiftedMom</b> integrated Orange's SMS, #303# My Store and Direct Carrier Billing APIs into its platform in production mode at Orange Fab Cameroon.</p>	
 <p><b>4 QUALITY EDUCATION</b></p>	<p><b>Chalkboard Education (Ghana):</b> The edtech start-up provides Africans with distance-learning university courses. The start-up offers an easy mobile learning solution that allows universities to upload teaching materials. Students can access these courses with or without an internet connection. Chalkboard Education addresses the issue of connectivity through USSD and SMS technology.</p>	
 <p><b>5 GENDER EQUALITY</b></p>	<p><b>Kasha (Rwanda):</b> The e-commerce start-up sells and delivers healthcare and private health products for women such as contraceptives and tampons. Customers can access Kasha via USSD, mobile and a web application. Customers using USSD can simply type in a short code to access Kasha's menu and place orders.</p>	

 <p><b>6 CLEAN WATER AND SANITATION</b></p>	<p><b>Skyfox (Ghana):</b> The social enterprise, which reduces service downtime, runs a project in rural Ghana. When a water hand pump breaks, someone in charge (usually a caretaker) can initiate a USSD session to send a report to a technology platform managed by SkyFox, which updates the status of the facility as "Not Working". Simultaneously, information is sent to a set of mobile phones of individuals such as mechanics who can fix the water hand pump.</p>	
 <p><b>7 AFFORDABLE AND CLEAN ENERGY</b></p>	<p><b>Brighterlite (Pakistan):</b> Brighterlite provides high-quality solar home systems to low and medium income households. In Pakistan, Brighterlite's customers can pay for their monthly rentals via USSD (more details in GSMA Mobile For Development report: "<a href="#">Easypaisa: A mobile operator-led solar PAYG model for Pakistan</a>").</p>	
	<p><b>Onelamp (Uganda):</b> The social enterprise provides last-mile on-demand delivery service for clean energy to those at the base of the pyramid. Through USSD and SMS services, Onelamp offers same-day delivery of solar lamps to off-grid households.</p>	
 <p><b>8 DECENT WORK AND ECONOMIC GROWTH</b></p>	<p><b>UX (Mozambique):</b> The Mozambican start-up launched <b>Biscate</b> to connect workers in the informal sector to customers via web and USSD technologies. Informal workers in Mozambique usually lack (or have very little) access to the internet. With USSD technology, informal workers have greater access to employment and income opportunities. More information available in the Biscate case study above.</p>	
 <p><b>11 SUSTAINABLE CITIES AND COMMUNITIES</b></p>	<p><b>Online Cabs (Sri Lanka):</b> The start-up runs a mobile-based taxi booking service. To achieve the widest possible reach, Online Cabs partnered with Dialog Sri Lanka's <b>Ideamart</b> to integrate its USSD, SMS and location APIs. Using either the USSD or SMS booking option, users can now book taxis using a basic phone.</p>	
 <p><b>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</b></p>	<p><b>Verdant (Nigeria):</b> The start-up offers agronomy services such as geo-location based weather forecasting, soil preparation, crop cultivation advice and post-harvest advisory services including market price information, financial planning and supply chain information. Farmers can interact with the services via USSD, SMS and IVR.</p>	
 <p><b>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</b></p>	<p><b>BenBen (Ghana):</b> A solution for governments to convert physical land titles to digital copies via Blockchain. BenBen provide citizens with a USSD, Android and web platform that allows them to manage land records and perform land transactions.</p>	



## Mobile operators and USSD APIs in emerging markets

USSD was initially used by mobile operators for self-care, but the number of use cases has grown exponentially. Many operators realise the economic potential of providing APIs access to local developers and entrepreneurs and have launched a variety of initiatives. Highlighted below are three examples

- **AXIATA (SRI LANKA):** Dialog Axiata launched a business unit in 2012 to power its API platform Ideamart. Dialog has since partnered with competitor Hutchinson Telecommunication to enable developers to seamlessly connect to both mobile operators' APIs via Ideamart's platform. There are currently nearly 2,000 USSD-powered apps on the [Ideamart](#) platform. As a result, the number of USSD API calls generated for August 2017 was 2.8 million.
- **ORANGE (AFRICA):** The mobile operator runs a platform, [#303# My Store](#), which enables developers to plug into a standardised USSD API. [#303# My Store](#) is active in Cote d'Ivoire, Cameroon and DRC with around 50 third-party services accessible on the platform. There are approximately 200,000 unique average monthly users on the [#303# My Store](#). Orange is now looking to expand the service to its operations in Egypt, Mali and Senegal in early 2018.
- **9MOBILE (NIGERIA):** The mobile operator has partnered with APIs aggregator [Africa's Talking](#), a Pan-African software solution company, to empower developers and SMEs with access to telecom infrastructure through APIs. The partnership will enable the provision of mobile communication tools such as two-way SMS and USSD APIs to start-ups and SMEs<sup>4</sup>.

of mobile operator USSD APIs platforms. For more extensive research on the potential of open mobile operator APIs read our previous publication – [APIs: A bridge between mobile operators and start-ups in emerging markets](#) – and video – [The Power of Mobile Operator APIs](#).



## Looking ahead: calling emerging markets' start-ups to consider the USSD opportunity

From the aforementioned examples, we have observed that start-ups tend to take two approaches when deploying USSD technology. Some use USSD-only solutions, while others leverage USSD to complement their SMS, IVR, web and/or mobile applications. The latter approach exposes start-ups to a wider addressable market, allowing them to reach customers with and without internet-enabled phones.

The GSMA Ecosystem Accelerator expects a rise in the use of USSD as more mobile operators open up their APIs and as aggregators like Africa's Talking or hubtel integrate with more and more operators regionally.

There is a growing trend of start-ups integrating USSD with emerging technologies i.e. Blockchain (BenBen, Ghana) and AI (Casava, Nigeria). USSD also works hand in hand with Internet of Things (IoT) solutions since it is designed specifically for transferring small quantities of data and it utilises less power than standard IoT mobile connections<sup>5</sup>.

USSD combined with emerging technologies hints that despite being more than 20 years old, USSD is not archaic and remains a relevant communication channel to deliver mobile services in emerging markets, especially to low-income populations.

We therefore encourage emerging markets start-ups developing mobile services for the mass market to look carefully at the opportunities offered by USSD technology and engage with local mobile operators to unlock them.

<sup>4</sup> <https://www.vanguardngr.com/2017/08/nigerian-software-developers-get-9mobile-api-boost/>

<sup>5</sup> <http://www.hatchmfa.com/overview-of-ussd-for-iot/>