Innovative mobile digital identity solutions

Financial inclusion and Birth Registration

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Contents

Introduction

In 2017 the mobile industry connected more than five billion people[1]. This number is set to increase over the next eight years, driven by developing countries such as India, China, Pakistan, Indonesia and Bangladesh as well as regions such as Sub-Saharan African and Latin America, as rural network coverage improves, and handsets and tariffs become more affordable[2]. Many countries are beginning to implement robust digital identity systems, and the transformative power of mobile technology, as well as its near ubiquity (66 per cent[3] of the world's population had mobile phones in 2017) has been recognised as an important enabler in the identification process.

In contrast to improvements in connectivity, the World Bank estimates that there are currently one billion people worldwide who lack the means to prove their identity, a problem that is particularly acute across Africa and South Asia. This problem disproportionally affects those groups of society that are most vulnerable, such as women, children and refugees, resulting in them being at higher risk of being excluded from systems meant to protect them, as well as limiting their access to basic services such as healthcare, education, employment, financial services and voting. There are many reasons individuals might lack a proof of identity, and these can range from cost, inefficient registration systems, a lack of awareness of the importance of identification, or illiteracy. The United Nations Sustainable Development Goals (SDGs)[4] seek to address the global 'identity gap', as evidenced by goal 16.9: "By 2030, provide legal identity for all, including birth registration". Yet with only an estimated 87 per cent[5] of the world's population currently registered, innovative new methods to reach the last mile will be needed to achieve this goal.

In this case study, we explore two emerging and innovative solutions that are using mobile technology to establish functional and foundational identities. Functional identities[6] tend to be those that are created with a specific purpose in mind and therefore tend to be provided by one of many different entities. This could include a voter card, health record or bank card. In contrast, foundational identities[7] tend to be universally available, used for a variety of purposes and consequently are often provided by governments for their citizens to be able to prove their identities.

The first case study highlights Juvo's Flow Lend solution, which is currently providing mobile phone customers in the Caribbean with a functional 'financial identity' by analysing their mobile phone usage and top-up activity. This has provided predominantly pre-paid Flow Lend customers with a recognised credit score and access to mobile financial services for the first time, while also enabling Cable & Wireless (C&W) to understand the needs of these customers and significantly reduce churn rates (the numbers of customers switching between mobile providers). The second case study explores iCivil's partnership with the government of Burkina Faso to use mobile technology to facilitate birth registration, particularly in rural areas where birth registration rates remain low. As governments are increasingly looking to digitise their services, and as mobile operators look for new ways to increase revenues, partnerships with governments can result in the unlocking of new opportunities and revenue streams.

1. GSMA "*The Mobile Economy 2018*". Available at https://www.gsma.com/mobileeconomy/
2. Ibid
3. Ibid
4. See http://www.un.org/sustainabledevelopment/sustainable-development-goals/
5. World Bank ID4D, GSMA Intelligence
6. For a definition of functional identities see https://www.gsma.com/mobilefordevelopment/programme/digital-identity/using-mobile-technology-provide-functional-identities/
7. For a definition of foundational identities see https://www.gsma.com/mobilefordevelopment/programme/digital-identity/digital-foundational-identities-using-mobile-technology/

CASE STUDY 1

Establishing Financial Identities through Juvo's Flow Lend Solution

Despite the fact that identity registration rates in the Caribbean are much higher than those seen in Africa and South Asia, it was estimated in 2014 that only 54 per cent[8] of adults in Latin America and the Caribbean had an account at a financial institution (this compared to the global average of 69 per cent)[9]. In these highly cash-based societies, people are also more likely to face barriers accessing formal financial services such as credit, as despite being able to prove their identity they are unable to prove their income or credit history. As a result, of the 58 per cent[10] of people in the Caribbean that have mobile phones, 81 per cent[11] of these connections are pre-paid. Pre-paid subscribers have to physically visit a mobile operator's retail location, or registered dealer, to top up their credit which means that they can often go several days without mobile phone access when their credit runs out. For mobile operators, the high proportion of pre-paid customers results in low brand loyalty, high churn rates and low levels of average revenues per user (ARPU).

Juvo and Cable & Wireless

In 2015, C&W wanted to explore opportunities to improve brand loyalty and investigate new ways to better understand who their pre-paid customers were, in order to be able to design and offer them appropriate value added services including access to credit and other financial services. This led C&W to partner with Juvo – who currently operates in 25 countries and four continents, reaching over 500 million subscribers through it's mobile operator partners - to offer airtime credit extensions to their Caribbean pre-paid subscribers through the Flow Lend solution. Flow Lend aims to help pre-paid mobile customers who find themselves financially excluded establish 'financial identities' by analysing their transaction histories and providing them access to micro-finance.

8. Global Findex 2018. Available at https://globalfindex.worldbank.org/
9. Ibid
10. GSMA Intelligence, Market Penetration – Q4 2017 (Accessed March 2018).
11. Ibid

How does the solution work?

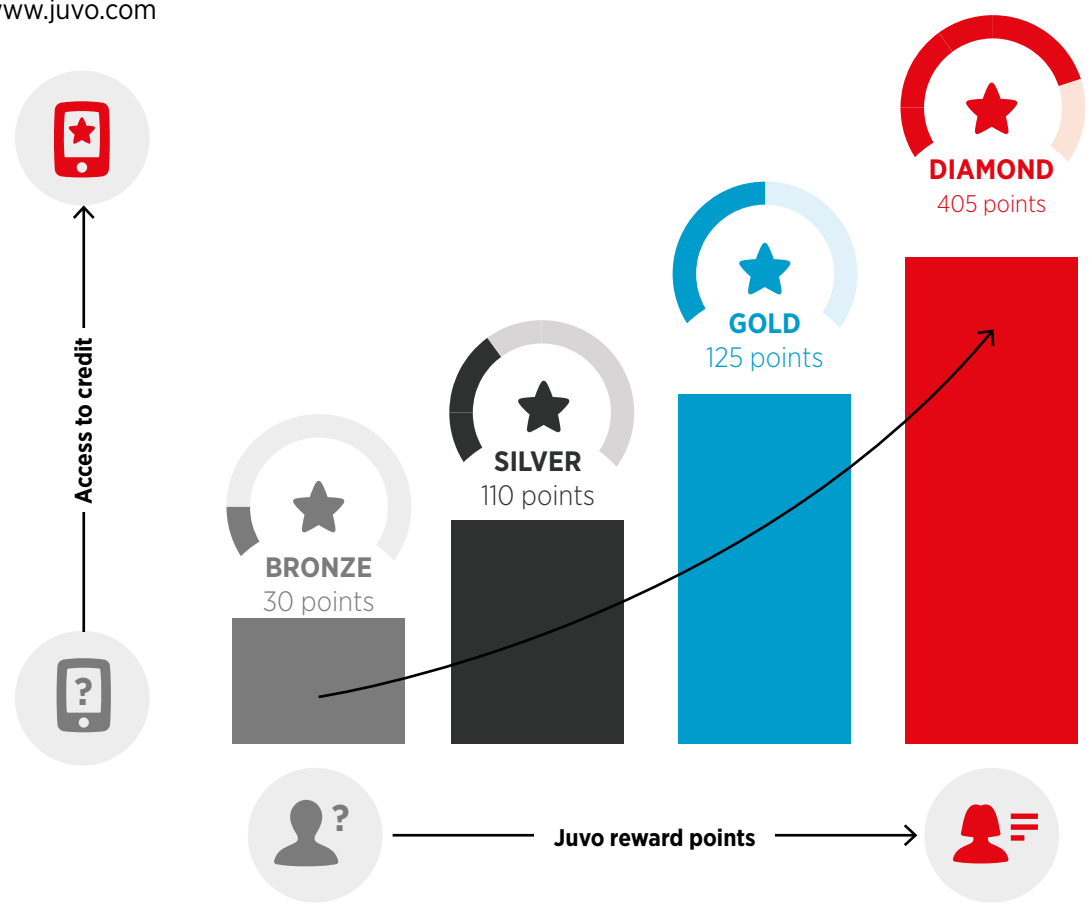
Flow Lend was offered as a free to download app, available initially on Android and iOS, to C&W pre-paid subscribers. After a period of time it was also made available to feature phone subscribers via a USSD interface so that all pre-paid subscribers could have access to the service. Subscribers were initially introduced to the service via an SMS alert offering them an airtime credit extension if they subscribed to the service.

Once a customer is registered for the service, whenever they reach low balance levels they continue to receive Flow Lend credit extension offers of airtime based on their repayment history. The Juvo solution uses data science (the analysis of mobile-derived 'big data') and game mechanics (methods to engage and motivate subscribers to interact further) to analyse the subscriber's behaviour and assign an 'Identity Score'. In this way, a profile of a relatively unknown pre-paid subscriber is built and their financial credit worthiness can be predicted based on their mobile phone usage.

C&W subscribers begin at the basic bronze level where they are able to access small amounts of airtime credit, such as $1 or $2, interest free. Once the credit extension is activated, airtime credit is available instantly and can be repaid when next topping up at local top-up locations. Based on their phone usage and repayment history, subscribers are able to access progressively larger credit extensions for longer periods of time. As subscribers "prove" their credit worthiness by making repayments in the time they are allocated, they are rewarded with points which enable them to move up levels to silver, gold and diamond, which in turn enables them to access increasingly larger credit extensions. The progression through levels, from Bronze to Diamond (see Figure 1), also allows C&W to learn more about the phone usage of their previously anonymous pre-paid subscribers.

Figure 1: Subscriber progression through the Juvo levels

www.juvo.com



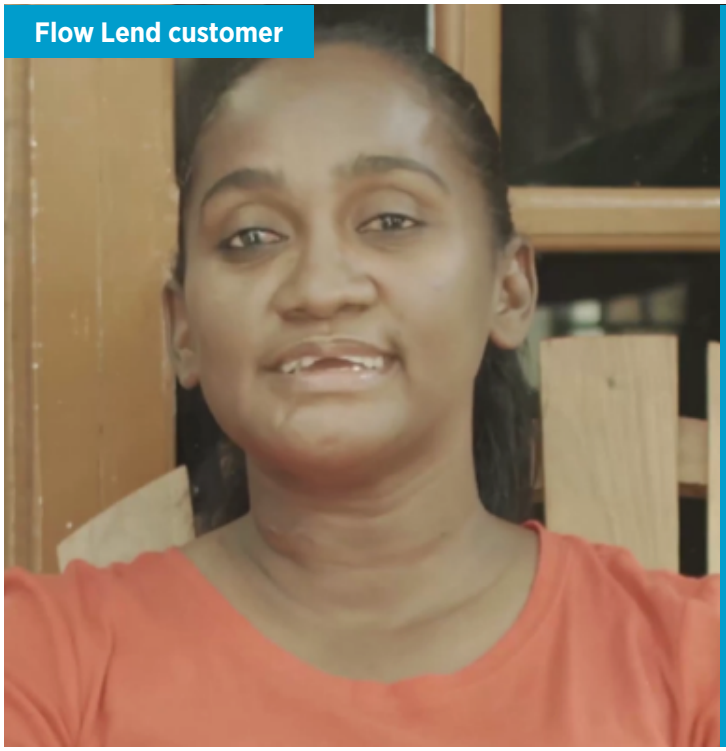
Results

Launched in 2016, Flow Lend is available to C&W subscribers in 14 Caribbean markets[12]. Within the first four months over 50,000 subscribers had installed the app, and to date over 50 per cent of all pre-paid C&W subscribers are active Flow Lend customers. The ease of use, and ability to quickly check balances, has resulted in approximately 25 per cent of Flow Lend customers opening the application at least once every day.

Currently the solution has a 97 per cent repayment rate on airtime credit extensions, and as a result subscribers have been progressing through the Juvo credit levels. As of August 2017 there were 30,000 subscribers at "Diamond" level, with customers taking on average 80 days to progress to this level from the "Bronze" entry level. To date there have been 9 million transactions via Flow Lend, translating to $25 million in airtime credit extensions.

The value of the Flow Lend solution has been proven to both subscribers and mobile operators, particularly as subscribers come to rely on the solution in times of need. One particular example highlighting this was when Hurricanes Irma and Maria hit the Caribbean in September 2017. In preparation for the storms and in the storms aftermath (due to shop closures) airtime credit extensions nearly doubled in some of the islands directly in the path of the hurricanes.

Flow Lend customer



Jackie is a Flow Lend customer in Jamaica. Before Flow Lend she would often wait three days to a week without credit as she was unable to travel to a top-up location. She first heard about Flow Lend when she ran out of credit and received an SMS alert offering her an airtime credit extension. She immediately signed up and downloaded the Flow Lend app. She used the credit facility to top-up her own balance and send airtime credit to her children. She started at the Bronze Level and worked up to being able to access $75. She continued taking out credit extensions and post-paying for them within the stipulated times and has now reached "Diamond" Level. For Jackie, the biggest benefits have been the ability to post-pay for airtime extensions (interest free) and have continuous mobile phone access.

12. Anguilla, Antigua, Bahamas, Barbados, British Virgin Islands, Cayman Island, Dominica, Grenada, Jamaica, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, and Turks & Caicos

The partnership with mobile operators

Juvo partners with mobile operators on a revenue sharing basis. The partnership allows Juvo to access a subscriber's mobile phone usage (under strict confidentiality agreements) and help identify and create financial identities for pre-paid subscribers about whom little (in countries where SIM registration is mandated) or no (in countries with no mandatory SIM registration) information is known. Being able to build a picture of pre-paid subscribers based on their top-up history and ability to pay back credit, and offer financial services to this otherwise anonymous group, has allowed C&W to build a relationship with these subscribers and reduce churn by 50 per cent. In addition, as a result of being able to access airtime credit extensions, Flow Lend customers typically consume more C&W services translating to a 10 per cent increase in ARPU and increasing the lifetime subscriber value by 63 per cent.

Future opportunities beyond airtime

In addition to partnering with C&W, Juvo has partnered with Telefónica, Tigo, Tune Talk, Deutsche Telekom, and Sprint to offer airtime credit extensions to their customers. The benefits for mobile operators are clear. They are able to start creating profiles for their pre-paid subscribers, and from this they are able to offer a service that engages loyalty and increases usage of their services. Once financial identities have been established for these subscribers some future opportunities include:

1) Smartphone Financing:
One next step is to progress from airtime credit extensions to offer smartphone financing. To this end, Samsung are partnering with Juvo to provide smartphone financing for pre-paid subscribers. Subscribers who have qualified to the appropriate level will be eligible to obtain a Samsung smartphone on credit. The smartphones will come personalised for the subscriber, with the Juvo app preinstalled and with an account set up for them. Juvo predicts that the migration from basic phone to smartphone will result in an average 30 per cent increase in data consumption per subscriber for mobile operators.

2) Personal and business loans:
As pre-paid subscribers build up their financial identities and prove their credit worthiness, another option would be to extend the borrowing capabilities from airtime credit extensions to cash sums. This could take the form of personal or business loans either through the existing credit extension model or through partnerships with local banks. The latter example would involve a method of sharing the credit scoring carried out through the Juvo app so that banks can translate this information to assess the credit worthiness of loan applications.

CASE STUDY 2

iCivil

According to the World Bank it is estimated that only one in three[13] infants in Sub-Saharan Africa have their births registered. Yet birth registration is often the first important step in recording a child's identity and permitting them to access vital services, as well as allowing governments to effectively plan a country's infrastructure and provision of public services.

In Burkina Faso government efforts have been made to improve birth registration rates, resulting in approximately 77 per cent[14] of births being registered. However, this still leaves almost 2.3 million children under the age of 18 unregistered[15]. Urban registration rates are typically higher, at 93 per cent[16] versus 74 per cent[17] in rural areas, indicating that efforts are still needed to reach full population coverage particularly in remote locations. Additionally, births that take place in hospitals and health centres are more likely to be registered than those that take place in rural villages or in the home.

Burkina Faso, like many other countries, legally requires parents to register the birth of their children and registration is free within 60 days of the birth. Despite this, there are many reasons that can prevent birth registration from taking place. These can range from physical barriers such as costs or time involved to physically register the birth, to less physical barriers such as traditional customs, which involve a delay in naming the baby or a lack of perceived importance in registering the birth. This despite the fact that the existence of a birth certificate can protect children from trafficking[18], early marriage (52 per cent of girls in Burkina Faso are married by the age of 18[19]) and child labour (39 per cent of children aged five to 17 are taking part in economic activities in Burkina Faso[20]).

13. Unicef, December 2017. Available at https://data.unicef.org/wp-content/uploads/2018/01/Civil-Registration-English-Web-Final.pdf
14. World Bank ID4D 2018 dataset. Available at https://datacatalog.worldbank.org/dataset/identification-development-global-dataset
15. Ibid
16. Ibid
17. Ibid
18. See https://www.crin.org/en/library/news-archive/burkina-faso-millions-receive-birth-certificates and https://www.cia.gov/library/publications/the-world-factbook/geos/uv.html
19. Unicef 'State of the World's Children 2017 Statistical tables'. Available at http://data.unicef.org/resources/state-worlds-children-2017-statistical-tables/
20. Ibid

iCivil

iCivil was initially founded to help address the issue of "ghost" children, those whose births are not registered and who therefore do not legally exist. iCivil identified that the main barriers to registration in Burkina Faso were the distances required to travel to administrative centres to complete the registration paperwork, and the fact that parents generally delayed giving a name to a newborn due to religious practices (Muslim children are generally named on the seventh day following the birth). The iCivil registration solution was designed to be simple and bypass the typical delays associated with birth registration, yet at the same time respect legal requirements and remain compatible with the existing national registration system. Above all the system was designed to ensure that the identity of each baby could easily be authenticated and remain unique.

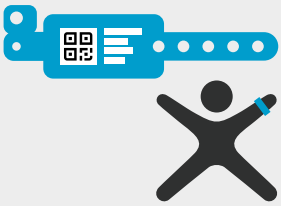
How does the solution work?

Birth registration, particularly in rural areas, has not yet become a universal practice in Burkina Faso. To address some of the barriers associated with low levels of birth registration iCivil developed an innovative hospital bracelet that is attached to new born babies by health professionals following their birth (see Figure 2). Each iCivil bracelet is unique courtesy of a Bubble Tag™, a transparent polymer that contains a distinctive distribution of 3D bubbles, which is incorporated into the design of the bracelet. The Bubble Tag's uniqueness is guaranteed through a specialised process that produces a random distribution of bubbles that is impossible to replicate[21], much like a fingerprint, and each Bubble Tag corresponds to a single reference number in the government's iCivil database. Once the iCivil bracelet is attached to the baby, a QR code on the bracelet is scanned to bring up the iCivil app. The app allows the initial health worker to enter in information relating to the baby (such as date of birth, name of parents, etc) and allows subsequent information (such as the baby's name) to be entered at a later time. As a result, if all the information required for the birth registration is not provided at the time of the birth then the parents can simply go to a local registration centre and present the iCivil bracelet to the birth registrar to complete the process. This will then enable the birth registrar to verify the authenticity of the registration request via the iCivil app and confirm what information is still outstanding. Once all the information to complete the birth registration has been collected, an encrypted SMS is sent to the government's iCivil database and forwarded to the National Birth Registry for approval. The final part of the iCivil solution allows the same iCivil bracelet to be presented and authenticated to permit the collection of the official birth certificate. The iCivil bracelet is kept by the parents and becomes a de facto means of identification for the child as if the official birth certificate is later lost or damaged the same process of presenting the iCivil bracelet is used to obtain a replacement certificate.

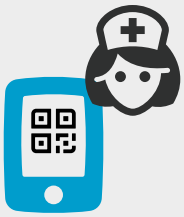
From the parents perspective the solution is simplified as they can complete the birth registration process at a time and location convenient to them. From the government's perspective the solution is simple to deploy, allowing for more areas of the country to be covered through this system and increasing the likelihood of registration taking place. For the health workers, the previously manual system is replaced by an electronic process and electronic form, meaning that errors are less likely to occur and it is easier to retrieve half-completed forms and update records.

21. See http://www.prooftag.net/bubble-tag/

1. The iCivil hospital bracelet is placed around the arm of the newborn



2. The midwife uses the iCivil mobile phone app to scan and verify both the QR code and the Bubble Tag



3. A registration form is displayed on the phone where information relating to the birth can be entered

4. Once completed the information is sent via an encrypted SMS to the government's iCivil Server

5. The encrypted SMS is verified and an acknowledgement is sent back to the mobile phone

6. The registration details are forwarded to the National Birth Registry

7. The birth certificate is printed with the image of the infant's iCivil bracelet Bubble Tag

8. The iCivil bracelet is kept by the parents and can be used for the procurement of official documents

Results of the pilot

Between August 2015 and July 2016, a pilot was run in the capital of Ouagadougou in 10 maternity wards and the main registry office. Over the course of the year more than 2,600 newborns were registered through the iCivil solution, representing a 30 per cent increase in birth registration compared to previous years. The success of the project was in part due to the simplicity of the solution, the fact that it digitised the existing birth registration process, and the fact that it was possible to accurately verify the babies through their unique iCivil bracelets. From a training perspective, the iCivil bracelets and smart phones preloaded with the iCivil app were supplied to the participating health centres and hospitals, and health visitors were just required to learn how to scan the iCivil bracelets and use the app. Once the registration form was displayed in the app, the process was the same except in digital form. Parents were simply required to keep the iCivil bracelets safe and present them to complete the registration process or when requesting certificates.

The pilot successfully registered all births that took place during the chosen pilot locations in the capital of Ouagadougou during the pilot period. iCivil attributes this success to the fact that the solution respected the traditional practice of birth registration in Burkina Faso. The true test for the solution, however, will be when it is scaled up to a regional or national level, or implemented in a country outside of Burkina Faso.

From pilot to implementation

Having demonstrated that the solution works, iCivil are now looking to launch the solution more broadly in different markets across the African continent. The model that they are proposing is based on a licencing agreement with the government. Licences will be issued to governments for a limited period on a renewable basis, and would cover the costs of registration of citizens through the iCivil solution. The cost of the licence will vary, and be based upon the estimated volume of registrations expected. In addition to the licence fee, the government will be expected to cover the production costs of the iCivil hospital bracelets. iCivil will provide the initial training required for all civil registrar representatives and for the health workers. However, each country will be required to allow iCivil to send registration details to their National Registry, and furnish personnel who will carry out the registrations via the iCivil app.

There is an opportunity for mobile operators to also collaborate with iCivil in a similar way that operators have collaborated with governments in other countries, from using their agent network to facilitate rural registrations or vaccination programmes, to processing incentivisation payments to health workers and registrars via mobile money.

1) Civil Registration and Vital Statistics (CRVS)

One such example is Telenor in Pakistan, who in conjunction with the local government and Unicef is using a similar birth registration process with the aim to register over 700,000 births in two provinces by the end of 2018[22]. As well as providing technology support, through development of the birth registration app, Telenor are providing handsets, SIMs and processing mobile money payments to those carrying out registrations. Telenor agents were additionally able to help promote and facilitate the registration of births in rural areas through their agent network. Another example of collaboration is Tigo who have partnered with the government in Tanzania and Unicef[23] to register over 2.7 million children since 2013 through a mobile app. Involvement in both these projects has provided operators with significant reputational value, as well as offering them new opportunities in the form of new customers and new opportunities to collaborate with government in providing further digital services.

The iCivil method of registering babies could be rolled out in much the same way as either the Telenor Pakistan or Tigo Tanzania examples, collaborating with governments and building on the strengths of mobile operators. For mobile operators, as well as being able to participate in a programme of birth registration, there are further opportunities for supplementary government partnerships in the registration of other life events. The iCivil solution additionally allows for the production of iCivil identity cards, which could be issued to older children and adults to simplify the registration of other key life events, such as marriage, death and divorce. The process would be similar to that of the iCivil birth registration process, except in these cases the iCivil identity card, incorporating the Bubble Tag and QR code, would be used. When scanned through the iCivil app, the authenticity of the iCivil identity card would be verified and allow the registrar to select the appropriate CRVS form and capture the required registration details. As with the iCivil hospital bracelets, the iCivil identity cards could also act as a means of validating authorisation requests for obtaining CRVS certificates.

If the registration programme is extended to adults in the form of identity cards that incorporate the same Bubble Tag technology, then operators could partner with governments and iCivil to use the iCivil app to verify the unique identities of subscribers for the purposes of Know Your Customer (KYC) requirements (SIM registration is currently mandatory in Burkina Faso[24] and in over 140 countries worldwide[25]). The advantage being that the scanning of the iCivil identity card via the iCivil app may require less investment in hardware on behalf of the mobile operators than other solutions such as biometric verification. The solution could also potentially be extended for other purposes such as proving identity when voting.

22. See https://www.gsma.com/mobilefordevelopment/programme/digital-identity/roadmap-digital-birth-registration-insights-scale-sustainability-pakistan/
23. See https://www.gsma.com/mobilefordevelopment/programme/digital-identity/birth-registration-tanzania-tigos-support-new-mobile-birth-registration-system/
24. See https://www.gsma.com/mobilefordevelopment/programme/digital-identity/access-mobile-services-proof-identity-global-policy-trends-dependencies-risks/
25. https://www.gsma.com/mobilefordevelopment/programme/digital-identity/access-mobile-services-proof-identity-global-policy-trends-dependencies-risks/

2) Health services

In other countries mobile network operators have collaborated with governments on maternal health and child vaccination programmes, to offer additional services to parents. One such example is the Kilkari solution in India[26] where mobile operators collaborated with the government to provide audio health messages, which new and expectant mothers could subscribe too. Another example is M-Vaccin in Côte d'Ivoire, a collaboration between the Ministry of Health , Orange and Gavi (the Vaccine Alliance), to increase immunisation rates in the country[27].

The issue of infants falling through the gap in government vaccination programmes has prompted iCivil to also develop a digital solution for national vaccination programmes. This solution, iCivil Santé, is designed to capture the mobile number of one of the parents at the time of the iCivil birth registration and send this information to a database that is managed by the country's Health Department. In line with the World Health Organisation (WHO) vaccination schedule, SMS alerts can then be sent to the parents to remind them when their baby is due a vaccination. Once the baby is taken to a health centre to have their vaccination, the iCivil bracelet acts as a form of proof of identity which can be scanned with the iCivil Santé mobile phone app to uniquely verify the baby and bring up their health records. The app can then be used to update the health record to show that the baby has received the vaccination. Finally, the app sends an SMS to update the Health Department database. Thus creating a verifiable vaccination record for the child, which can easily be checked and updated.

26. See https://www.gsma.com/mobilefordevelopment/programme/mhealth/kilkari-a-maternal-and-child-health-service-in-india-lessons-learned-and-best-practices-for-deployment-at-scale/
27. See https://www.orange.com/en/Press-Room/press-releases/press-releases-2018/Orange-Gavi-and-Cote-d-Ivoire-Ministry-of-Health-join-forces-to-boost-child-immunisation

Conclusion

As both Juvo and iCivil have shown, innovative new approaches combined with mobile technology, are successfully creating both functional and foundational digital identities and enabling access to services for people without proof, or sufficient proof, of identification. In the case of Juvo, the functional identity that is created gives increased financial flexibility to pre-paid subscribers. It builds up patterns of usage and thus a profile of that subscriber, while at the same time allowing mobile operators to increase revenue through improved brand loyalty and greater consumption of services. In the case of iCivil, there is an opportunity for the government and mobile operators to partner on the provision of digital foundational identities in order to reach full population coverage and offer a greater range of services. This can be achieved by leveraging advances in technology and combining them with the reach and coverage of operators to reach previously difficult locations amongst traditionally difficult to register citizens. Both these case studies highlight an opportunity for mobile operators to offer new services, either through in-house development or collaboration with new partners, to enhance market share and reduce churn, while at the same time increasing brand value, loyalty and revenue. They also illustrate how customers who may traditionally have been excluded from basic services are benefiting from the creation of digital identities via their mobile phone, enabling them to prove who they are and allowing them to access financial and civil registration services.

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