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VRITTI

THE DIGITAL FINANCIAL SERVICES GUIDE

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CONTENTS

Blurb

Dear readers,

Happy New Year!

In 2020 and years to come 'digital' will redefine financial services industry globally creating substantive social impact. India has already progressed on this path by leveraging the power of 'digital' to add value to lives of over a billion people. We discuss India's success in digital financial services and its transformative impact in detail in the article 'Digital Future of Development'.

Next, we let our technical expert do the talking on best practices to follow while adopting micro-services architecture in the article 'Micro-Service Architecture: Doing it the Right Way!'

Further, we explore strategies to address the global challenge of enhancing financial inclusion in rural areas in the article 'Five Ways to Extend Mobile Money Penetration in Rural Areas'.

Lastly, we learn about two new digital payment services – SBI Card Pay from India and inwi money from Morocco and discover what's innovative about them in the article 'What's New'.

I hope you like reading these articles, as much as we loved creating them.

Happy Reading!

Srinivas Nidugondi
EVP & Chief Operating Officer, Mobile Financial Solutions at Comviva


DIGITAL
FUTURE OF
DEVELOPMENT

— Srinivas Nidugondi

Fortuitous circumstances led me to visit the United Nations during the General Assembly week not too long ago. I was amongst the privileged few to participate as a panelist at the **Digital Future of Development** track during the proceedings.

In fact, my good fortune kept adding up. The panel was conducted by Achim Steiner, administrator of the United Nations Development Programme. Permit me to provide a brief overview of the proceedings. Overall, the session unearthed multi-dimensional perspectives. Unsurprisingly, really, given that each individual is a trailblazer in their respective field!

The first panelist, **Rob Nail**, Chief Executive Officer (CEO), Singularity University, offered his perspective on technology uptake. He stressed that while the general expectation from any new technology is immediate (and phenomenal) uptake, this is a far cry from reality. Honestly, I couldn't agree more, technologies take time to reach an inflection point. Consider mobile banking and digital financial services. Initial adoption was sluggish (to say the least) in most countries, before an inflection point was reached. Thereafter, uptake took off significantly, to put it mildly.

Next up was **H.E. Dr. Amani Abou-Zeid,** commissioner of Infrastructure and Energy, the African Union. She passionately aired her views on the transformation the continent is undergoing, what with the uptake of artificial intelligence, et all. Her optimism was infectious; it spurred me to ensure our efforts in Africa increase multifold. Equally moving was **Gregory Rockson**, CEO, mPharma, who showcased the importance of leveraging technology to make medical treatment affordable for all. Last but certainly not the least, was **Natalie Jabangwe,** CEO, EcoCash. She highlighted how Zimbabwe has transformed into a digital-first financial services economy, whilst stressing upon the importance of financial inclusion.

On my part, I felt it pertinent to highlight the role India was playing in the field of digital financial services. As is common knowledge, India was one of the early adopters of digital financial services in the developing world.

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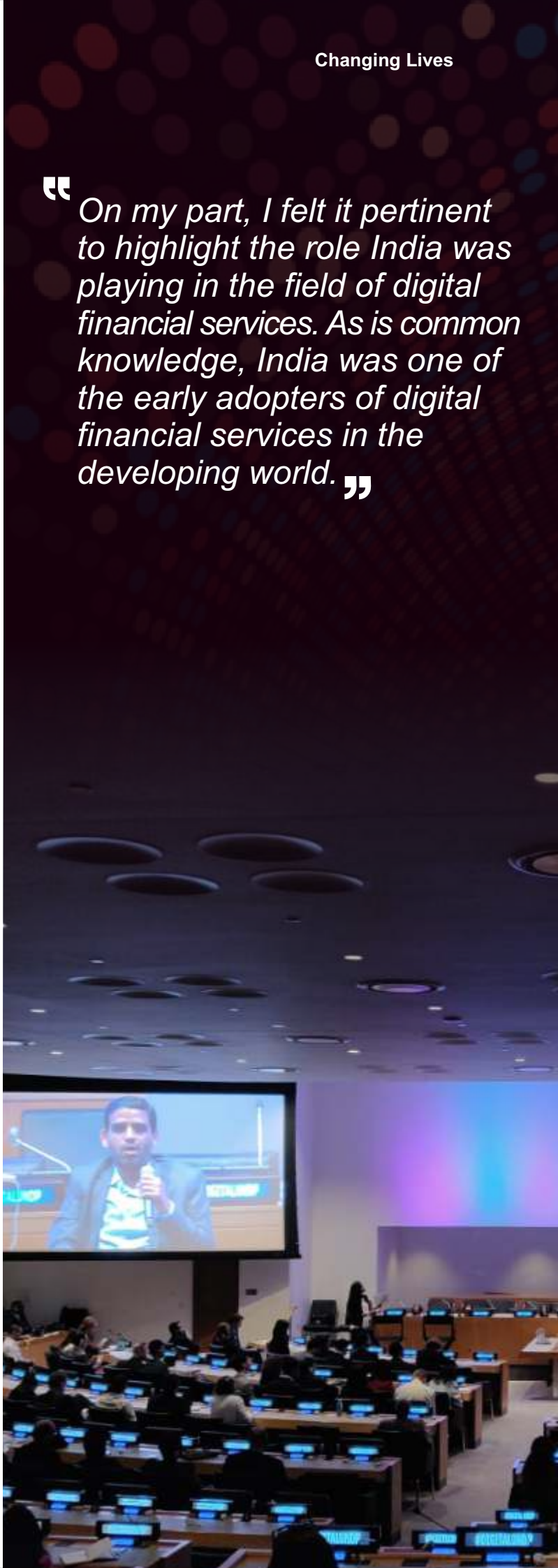


Internet banking made its foray in the country in the second half of the nineties, while mobile banking made its debut a decade later. Let's not forget, however, India offers an interesting study in contrasts. While a small part of the country was digitally evolving, a significant portion remained untouched by the digital revolution. This stark reality compelled government, banks and financial institutions to take drastic measures. These entities therefore collaborated and, subsequently, created disruptions to accelerate financial inclusion in the country.

It is imperative to state, however, that micro finance was the first major disruption in this space. The numbers tell all-as of March 2019, there are over 93 million microfinance accounts in India. The industry boasts a gross loan portfolio (GLP) of $26.38 billion. Another aspect of microfinance in India is the **Self-Help Group (SHG) movement**. This has, without a doubt, emerged as the world's largest and most successful network of women-owned community-based micro finance institution. The Self Help Group Bank Linkage Programme (SHG-BLP) is a landmark model initiated by the National Bank for Agriculture and Rural Development (NABARD) in 1992. It is aimed at delivering affordable banking services and facilitating financial inclusion. Today, SHG-BLP caters to 120 million households through more than 10 million SHGs. Deposits span over $3.24 billion and annual loan off-take value is $8.16 billion.

The JAM trinity (Jan Dhan, Aadhar and mobile phones) is another major initiative. **Launched in 2014,** Jan Dhan has certainly proved its mettle, providing over 370 million bank accounts. Consequently, over 80 per cent of India's adults are now financially included, compared to a mere 35 per cent in 2011. Notably, 53 per cent of Jan Dhan account holders are women and 58 per cent reside in rural and semi-urban areas. To provide a global perspective, Jan Dhan upholds several of the United Nations' Sustainable Development Goals (SDGs). These include the SDG 8, expanding financial inclusion, SDG 5 – giving women equal access to financial services and SDG 10 – promoting economic inclusion for all.

Universal financial access attained through Jan Dhan certainly changed the game. For one, the government obtained the opportunity to reduce corruption and losses incurred whilst transferring subsidies and benefits to citizens. The Direct Benefit Transfer (DBT)

and Aadhar tools proved very effective to achieve this. The DBT enabled the govern ment to directly transfer subsides and benefits of various social welfare schemes to the beneficiaries' bank accounts. Meanwhile, the Aadhar identification tool, with over 1.2 billion holders, was linked to the benefi ciaries' bank accounts which, of course, had its own set of benefits. Currently, DBT supports **437 schemes** of **56 ministries** and has **processed over $119.68 billion** since inception. DBT and other governance reforms **have brought about estimated savings of $19.78 billion.** Not just that, it has helped India make **significant progress in SDG 16 (Peace, Justice and Strong Institutions)** by reducing corruption.

It doesn't end there, of course. Merely storing funds in bank accounts isn't enough. Customers would, naturally, require touch-points to cash-out the funds, which is more vital since India is still primarily a cash-based economy. The Micro ATMs introduced by the National Payments Corporation of India (NPCI) in 2015 offered a viable solution. The aim is simple-expand the banking system's last-mile reach, particularly in rural areas. Since its inception, over 577 million financial transactions valuing $21.29 billion have been processed by micro ATMs. Moreover, mobile handsets have proliferated significantly, naturally implying that these devices have emerged as important transaction channels as well.

These initiatives, have, of course, had a cascading impact overall. Here's how- Collectively, the Jan Dhan, Aadhar, the proliferation of mobile handsets and DBT have simplified the implementation of government-driven schemes. These schemes, needless to say, drive the SDGs as well. For instance, the Ujjwala Scheme aims to provide clean cooking fuel to women who have traditionally relied on firewood, coal and dung cakes. An equally vital aim is to prevent premature deaths, due to polluted air in the household-estimated at 480,000 deaths per year! Under the scheme, 80 million households below the poverty line have been provided a free gas connection. This was followed by the “Give it Up” campaign, where over 11 million affluent customers surrender their LPG subsidy. These initiatives removed 38 million “ghost” or “fake” beneficiaries from the system.

The $6.3 billion saved was then distributed to customers in rural areas without access to clean cooking gas. The Ujjwala Scheme directly or indirectly impact multiple SDGs including SDG 3 (Good Health and Well Being), SDG 5 (Gender Equality), SDG 7 (Affordable and Clean Energy) and SDG 16 (Peace, Justice and Strong Institutions).

Another example is the Micro Units Development & Refinance Agency (MUDRA). This institution is aimed at providing loans to micro and small enterprises, with credit needs below $14,000. Under the MUDRA scheme, 155.6 million loans amounting to $101.26 billion have been disbursed. About 75 per cent of the recipients are women. The MUDRA scheme impacts the SDG 8 (Decent Work and Economic Growth) and the SDG 9 (Industry, Innovation and Infrastructure).

The National Payments Corporation of India (NPCI) threw its hat in the ring once again, with the introduction of two vital schemes. I allude, of course, to the Immediate Payment Service (IMPS) and the Unified Payments Interface (UPI). The former (for which I was, as a happy coincidence, involved in establishing the standards) provides 24×7 real-time interbank electronic fund transfer. The Unified Payments Interface (UPI) powers multiple bank accounts into a single mobile application (of any participating bank). Of course, several banking features, seamless fund routing and merchant payments are all merged under one hood. UPI allows users to create a unique virtual address (like abc@xyzbank) and use it for transferring money and make payments from devices such as mobile handsets. The IMPS and UPI have 498 and 141 participating banks respectively. Over the last one year, (from September 2018 to August 2019) IMPS and UPI have collectively processed 10.26 billion transactions, valuing $465.66 billion.

Clearly, progress has been marching on in India, with (hopefully) no signs of flagging. I would like to conclude by stating that technology ought to be invested in “for the greater good”. Digital technologies ought to encompass every section of society and every individual. No holds barred, of course.

About the author

Srinivas Nidugondi has over **21 years** of experience in various industries including financial services, payments and commerce in a variety of business and product related roles and most recently with a specific focus on enabling banking, payments and related services through digital channels. At Comviva he heads the Mobile Financial Solutions business unit, which currently has over 130 deployments globally, providing services for more than one billion consumers.

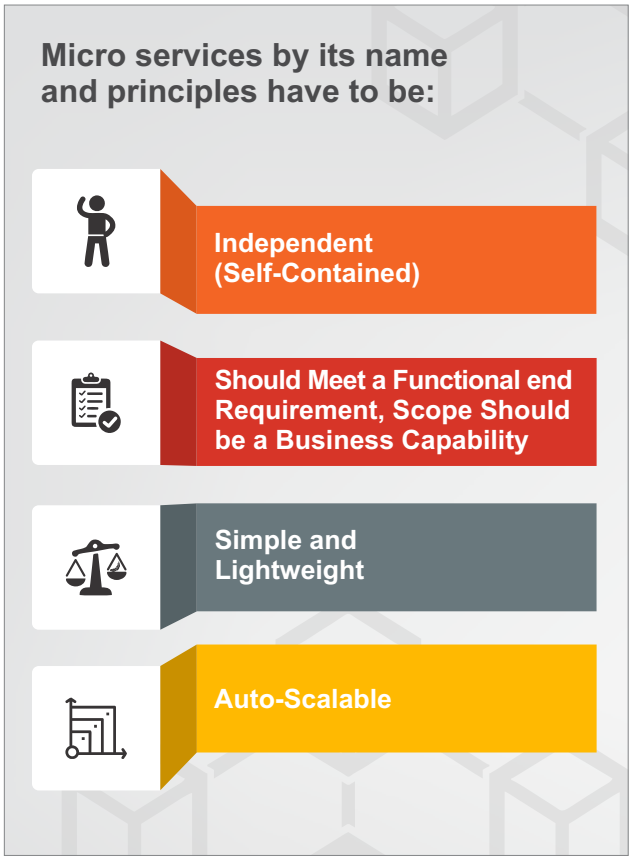
MICRO-SERVICE ARCHITECTURE: DOING IT THE RIGHT WAY!

— Shefali Dutta

Approach of solution designing and architecting has undergone an evolution with the concept of micro services. Monolithic architecture is still of use for certain types of applications but the need of reusable applications, independent functional components, ease of migration to new tech stacks, automatic scalability and agility is fulfilled by micro services. It started from SOA where components provide services to each other to meet the end requirements of the product rather than assembling all into one monolithic system. It is now fine grained into a micro services world.

In the rush these days to move to micro services, often the mistake to not follow the key design principles of micro services is made leading to a clutter of components in the system which are tightly coupled to each other making the product complex to debug, upgrade and be auto-scalable. So before anyone decides to adopt to micro services architecture, reason of migration to the new architecture should be very clear. Further, investment to discuss, debate and conclude on the design strategy that should be followed to get the most benefit from micro services should be done.

Comviva has adopted to micro services architecture for its products. It has been an enriching journey to reach where we are. Today, our micro services are designed and developed such that they are fully independent & reusable. The way product offerings and deployments are being planned is completely undergone a change. Just picking the right set of micro services to meet the business requirement is what is to be done for a deployment.

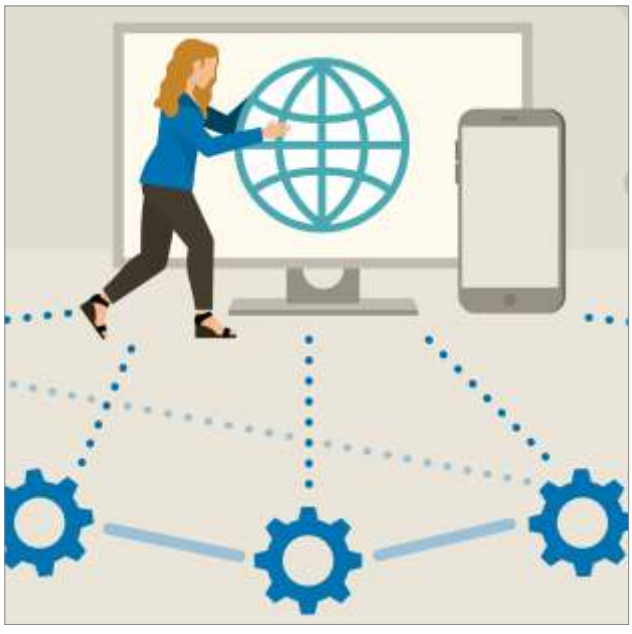


Calling a micro service “Independent” looks to be one simple term but brings in huge expectations from one simple application. A micro service can be independent in execution and deployment if it is a full stack application having one responsibility and hence meeting a business requirement.

Beyond this, the service does self-monitoring, regulates load and is scalable independent to any other micro service running in the system. Circuit breakers in the application open up when the application reaches an unstable state, system has the capability to apply pressure on the producer when consumers are not able to pick and process data, thresh holds are defined so as to eventually make self-healing and auto-scalability possible.

Independent micro services communicate using an async backbone. Comviva uses RabbitMQ as the message broker which is based on AMQP. Each micro service is mapped to a separate routing key in a single topic exchange.

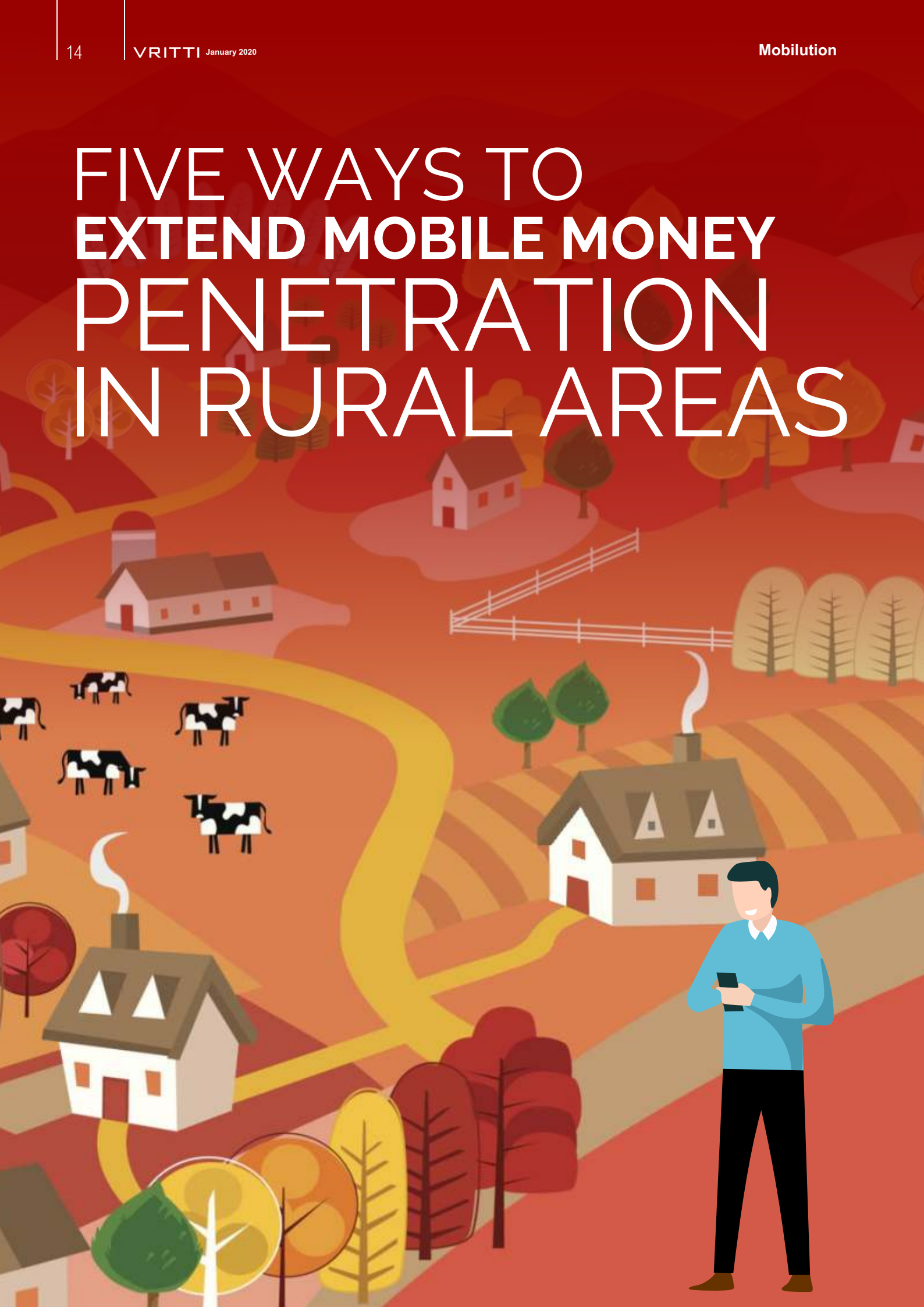
When there is a cluster of services which together make ONE product, there is a need to tie them up together with some principles so as to ensure clear definition of dependencies, clean and segregated configurations, an integrated CI/CD pipeline, logs as a stream and DevOps. Compliance to 12-factors for micro services enables this.



About the author

Shefali Dutta has **15 years** of industry experience in telecom and financial services domain. She has rich hands-on expertise in software solution architecture, agile, exploring new technologies and managing project deliveries across multiple products. At Comviva, she is a Technical Manager in Mobile Financial Solutions unit owning up multiple projects of mobiquity Money and payPLUS product lines.

FIVE WAYS TO **EXTEND MOBILE MONEY** PENETRATION IN RURAL AREAS



— Mohit Bhargava

Financial inclusion is rising rapidly. According to the World Bank, globally, **69 per cent** of adults or **3.8 billion** people held an account at a financial institution in 2017, up from **62 per cent** in 2014 and **51 per cent** in 2011. Mobile money has played a significant role in accelerating financial inclusion [1].

However, **1.7 billion** people are still financially excluded [1]. A significant number of these reside in rural areas; many are women, less educated and belong to the poorest **40 per cent** of population. Therefore, regulators, mobile money providers, financial institutions and government agencies require redoubled efforts to bring these sections into the formal financial ecosystem. This article identifies five strategies to extend the penetration of mobile money in rural areas.

[1] World Bank Findex

1

Adopt a Flexible Approach to Customer Registration and the Know Your Customer (KYC) Process

Many customers in rural areas do not possess formal identification and KYC documents, thus restricting access to mobile money services. Regulators require adopting a flexible approach to the KYC process for these consumers, to accelerate growth of mobile money in rural areas. Regulators ought to consider facilitating a tiered KYC model, where users with none and a limited number of KYC documents can access mobile money services, but with lower transaction limits. The tiered KYC model aptly manages risk by balancing transaction limits and availability of customer data.

Regulators should also consider permitting alternative documents for registering rural consumers without documents. These could include a reference letter from the head of the village or local employer, ration card, voter card et al. For women without any identification documents, their husband's identification document, along with proof of marriage can be used. Regulator can permit mobile money providers to run mass consumer registration roadshows in small and remote villages under regulatory supervision, where the head of the village or regional representatives can be present to identify villagers belonging to that area.

One third of the unbanked adult population, including many in rural areas, especially women do not own mobile phones. In such cases, handset financing has come to the fore as a viable solution. Mobile money providers can provide a handset and SIM card to consumers and register them for both, SIM and mobile money service simultaneously. The subscribers require paying a minor subscription fee and can pay the remaining amount in installments over the next few years. Blocking of the mobile phone, in case of non-payment of installments, can compel subscribers to pay installations on time.

2

Focus on Expanding the Rural Mobile Money Agent Network and Making the Business Viable

According to a World Bank report, the mobile money agent network in Malawi is skewed towards urban and semi-urban areas. 77 per cent of mobile money agents are located in urban and semi-urban areas, while only 33 per cent of agents operate in rural areas [2]. This is similar to many other countries. Clearly, mobile money providers require more efforts in expanding the mobile money agent network in rural areas.

Technology and data analytics can help in intelligently extending the agent network in rural areas. Mobile money providers can analyze data pertaining to voice calls, mobile money transactions, and the current location of agents,

to identify high activity areas such as rural business centers, trading zones near highways, border towns, etc, which require more agents. They can also identify remote and less populated areas with decent mobile penetration but low mobile money activity and place agents at these unserved points.

Agents in high activity rural areas usually obtain good business but are troubled by their inability to quickly replenish float (e-money) like in urban areas. On other hand, in remote and sparsely populated areas, agents are sometimes unable to sustain the business, owing to the low number of transactions or unavailability of cash due to more cash-outs than cash-ins. Hence, mobile money providers have to take special measures to ensure viability of agents business in rural areas. For example, EcoCash in Zimbabwe has set a much lower float and cash limit to start an agency business for rural agents, compared to urban agents (See exhibit 1) [3].

Exhibit 1- EcoCash Zimbabwe requirements to start agency business

Area	Minimum amount required to purchase float $1000	Minimum cash required to assist customers during cash-out
Harare Central Business District	$1000	$1000
Suburbs	$1000	$1000
Other Central Business District	$500	$500
Rural areas	$200	$200

To make the mobile money agency business viable in rural areas, service providers can opt for 'location-based commission structure', offering higher commissions to rural agents in remote and sparsely populated area with a low number of transactions.

To overcome float challenges, mobile money providers are offering float loans to their agent. The amount of float loans depends on the credit score of the agent, which is based on their transaction history and age on network. Mobile money providers can also provide loans to potential rural agents who are unable to start the agency business, due to high float or cash requirement.

Mobile money providers are also experimenting with predictive analytics to improve float and liquidity management. Based on the agent's transaction data, the volume of customers at a location, float balance, cash balance (can be recorded by agent on regular basis and fed into a predictive analytics system), mobile money provider can predict an agent's float and cash requirement on a daily, weekly and monthly basis.

[2] IT Web Africa
[3] EcoCash

3

Create Tailored Services for the Rural Segment

'One size fit all' services might not work for rural customers. Mobile money providers need to understand how rural customers earn, transact, save and borrow to create tailored product suited to their financial needs. For example, owing to the lack of an affordable formal financial infrastructure, community-based cash-centric financial organizations such as savings clubs, Village Savings and Loans Association (VSLAs), SACCOs and burial societies are popular in rural areas. Mobile money providers are digitizing these cash-based organizations and connecting them to mobile money. This is aimed at bringing the benefits of digital payments to these conventional financial systems such as security, transparency and interest generation.

Mobile money providers are experimenting with multiple need-based services for the rural population, such as, crop insurance for small-holder farmers, digitizing payments in supply chain for small agro-business, insurance for pregnant women to reduce maternal mortality, paying transportation fee for patients and enabling them to travel easily, digitizing birth registration and related payments in remote areas, loans for rural SMEs, et all. These services might cater to a niche segment, but will go long way in increasing mobile money adoption and usage in rural areas.

4

Leverage the 'Location' to Craft a Differential Pricing Strategy for Rural Areas

Disposable income in rural areas tends to be lower than urban areas. Hence, rural customers are generally more price sensitive, which mobile money providers need to consider while designing a pricing strategy. 'Location' can be an important tool in pricing. To encourage mobile money adoption in rural areas, service providers can set lower service charges on cash-out and bill payments in rural areas, compared to urban areas. Similarly, the service charge levied by merchants, whilst executing a transaction in rural areas should be less than in urban areas. In case of mobile savings accounts, higher interest should be given to rural customers. Governments and regulators should also think about setting lower taxes on mobile money transactions in rural areas.

5

Impart Financial Education to Make Mobile Money Services a Success

Mobile money services have to be promoted with adequate information to make them successful. For example, along with launching a mobile money-based savings club service, mobile money providers need to partner with NGOs or deploy agents to execute several tasks as well. These include working with traditional savings groups, explaining the service to them, describing the benefits of mobile money, demonstrating how to use the service, addressing queries, et all, thus, extending long-term support to enable the members of the savings club to seamlessly evolve from cash to digital. In villages, mobile money providers have to leverage community leaders, NGOs or deploy mobile money agents to extend information pertaining to finance and the benefits of digitization of financial services in rural areas.

Mobile money providers need to think 'out of box' to inculcate healthy financial habits in the rural population. For example, Shwe Toe, a financial and digital literacy application for women in Myanmar, launched by a mobile money provider, is using Gamification to promote healthy financial practices amongst women. The Shwe Toe application uses a game where a young girl's grandmother presents her with calf, and through different levels of the game, starts and expands her dairy business and eventually purchase a home, thus learning various financial concepts [4].

This article has merely scratched the surface of the options available to expand mobile money services and financial inclusion amongst rural and remote customers. Surely, mobile money providers will usher in multiple innovative ways to conquer this last frontier of financial exclusion.

[4] FinDev Gateway

About the author

Mohit Bhargava has **twelve years** of work experience in product marketing and research in the telecom and digital payment domains. At Comviva, he is serving as Deputy General Manager in product marketing for the mobile financial solutions portfolio. His areas of function primarily include evangelizing Comviva's mobile financial products and their impact on transforming the financial landscape globally.

WHAT'S NEW?
SBI CARD PAY SERVICE – INDIA

SBI Card, India's leading credit card issuer, has recently launched the SBI Card Pay service that enables customers to create a virtual card on their mobile phone for their physical Visa SBI credit card. The customers can now simply tap their mobile phone on a Near Field Communication (NFC)-enabled point of sale (POS) terminal to make payments. The service leverages host card emulation (HCE) technology and tokenisation to deliver swift, seamless, secure and convenient contactless mobile payments to customers.

To avail of the SBI Card Pay service, customers with an Android smartphone (housing Android OS KitKat version 4.4 and above) have to register their Visa SBI credit card on the SBI Card mobile application. This creates a virtual version of the physical card. Thereafter, customers can make payments at merchants by unlocking their mobile phone screen using fingerprints, the screen lock facility or an MPIN and tapping the phone at an NFC POS. This simple "tap and pay" process has made contactless mobile payments swifter and more seamless for customers.

Security has remained a priority, whilst launching this service. The SBI Card Pay service uses tokenisation to convert a customer's card information into a device-specific digital token. Hence, while executing a transaction, a digital token is shared and the customer's actual card information is never revealed to the merchant, thus securing the transaction. In case the customer's mobile device is misplaced, details of the card remain secure, as it is stored as digital tokens.

Moreover, customer convenience remains paramount. The service is a part of the SBI Card mobile application, which is a one-stop shop for managing credit card account, as well as making payments. Customers do not need to download any additional mobile application for this service. SBI Cards also allows customers the choice to set limits pertaining to per transaction and daily transactions. In case the customer's mobile device is misplaced and the digital token has been blocked, the physical card can still be utilized.

SBI Card Pay is leveraging next-gen technologies like HCE to deliver faster, secure and more convenient contactless mobile payments to consumers, redefining their payment experience. This new service will accelerate the growth of contactless mobile payments in India and make the country digitally empowered in the field of payments technology.

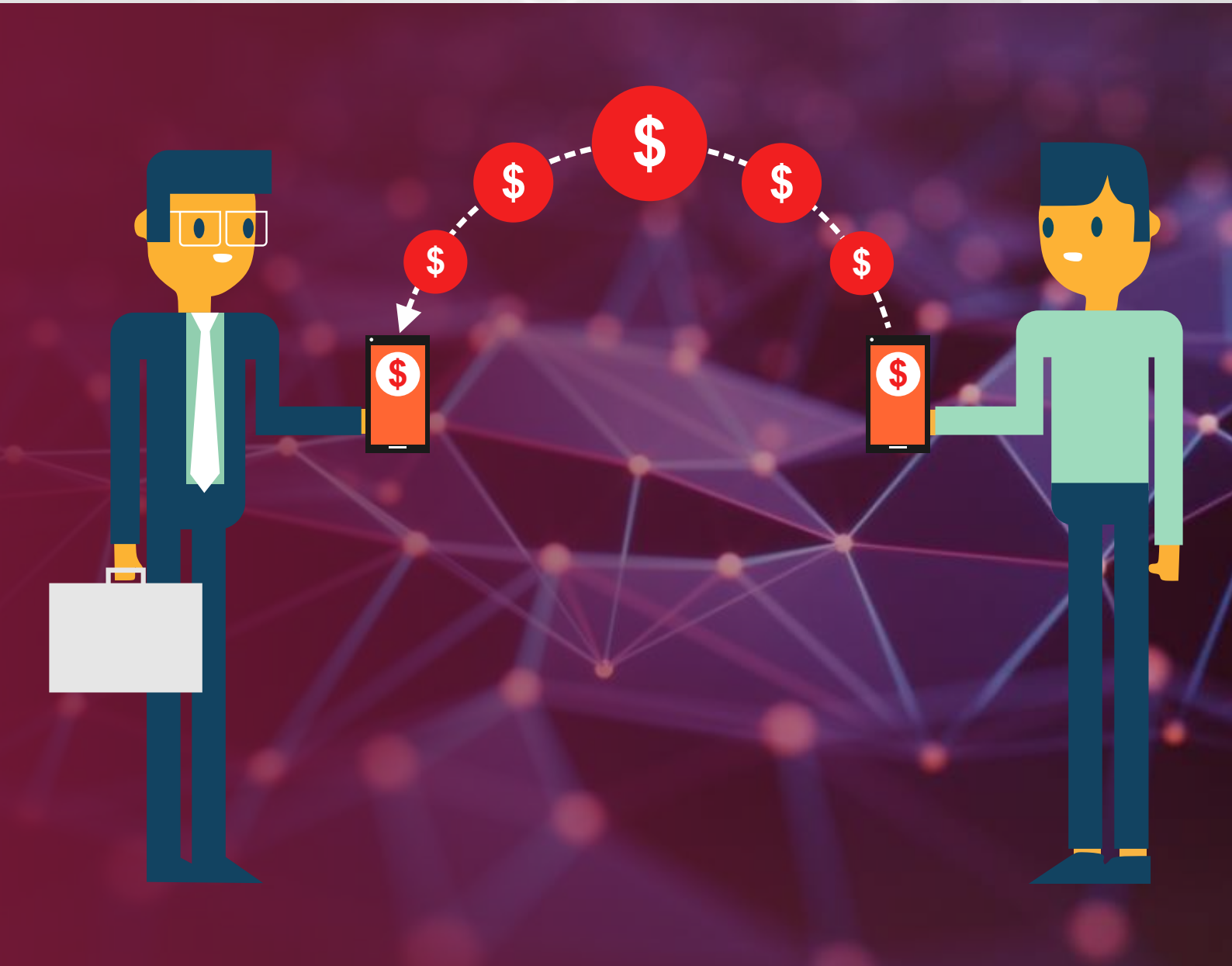
WHAT'S NEW?
INWI MONEY – MOROCCO

inwi, Moroccan telecom operator known for its digital innovations, has recently launched its mobile money service “inwi money”. The service offers consumers a quick, convenient and secure way to perform multiple financial transactions such as person-to-person money transfer, airtime purchase, bill payments and merchant payments.

Customers can access the service using any type of mobile phone through “inwi money” mobile application or USSD menu. The service is available in French and Arabic languages. It facilitates multiple levels of registrations ranging from self-registration to agents supported registration.

“inwi money” customers can send money to other “inwi money” customers instantly anytime anywhere. The service also allows customers to request money from other “inwi Money” customers. Customers can also recharge their own or other people’s mobile subscription using the app. Moreover, the contract customers can pay their mobile subscription bill from comfort of their home or office. The operator will also allow merchants to collect payments using “inwi money”. To pay merchant customers need to enter merchant’s mobile number or scan a QR Code.

“inwi money” service aimed at simplifying and enhancing lives of millions of Moroccans by providing them easy, fast and more convenient digital financial services”. By digitizing money transfers and payments “inwi money” will accelerate financial inclusion and contribute towards the economic development of the country.



IN THE MEDIA

UN WebTV: The Digital Future of Development

– Srinivas Nidugondi's panel discussion at the United Nations

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Harnessing Mobile Financial solutions for the Underserved

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About Comviva

Comviva is the global leader of mobility solutions catering to The Business of Tomorrows. The company is a subsidiary of Tech Mahindra and a part of the $21 billion Mahindra Group. Its extensive portfolio of solutions spans digital financial services, customer value management, messaging and broadband solution and digital lifestyle services and managed VAS services. It enables service providers to enhance customer experience, rationalize costs and accelerate revenue growth. Comviva's solutions are deployed by over 130 mobile service providers and financial institutions in over 95 countries and enrich the lives of over two billion people to deliver a better future.

For more information, please visit www.comviva.com

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