Interoperable Mobile USSD Code and QR Merchant Purchases

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1) Executive Overview

PayGo is a mobile payments framework that allows mobile banking customers to make secure static and dynamic merchant code and QR card-not-present purchases promoting interoperability and digital inclusion through the national switch, **Zimswitch**.

By leveraging the power of mobile and the 5 million Zimbabweans already digitally registered by the banks of Zimbabwe through the ZSS digital platforms, PayGo enables a **Virtual POS Ecosystem enabling every single till point, laptop, website, smart phone, tablet or traditional POS device into a highly secure virtual POS device**.

As it radically reduces the cost of service to all members while increasing security and convenience, PayGo ensures merchant control remains within the acquiring banking institutions and their providers, whilst protecting the merchant services commissions (MSC) and commercial arrangements that have traditionally been in place

PayGo is SI80 compliant, ensuring that all off-us transactions are processed Zimswitch, and is well positioned not only to drive significant new volumes through the **national switch**, but to rapidly contribute to never-before-seen levels of financial inclusion and convenience with superior Digital security and protection than that offered by traditional cards.

2) Benefits

PayGo creates value to institutions and customers alike at every level of the transactional life cycle through digitally enhancing service delivery whilst adhering to international and industry level best practise:

- Built around latest industry standards including EMVCO
- Promotes increased interoperability through Zimswitch
- Open framework made available to all, and no **forex licensing** involved
- Caters for micro merchants, all the way through to large supermarkets
- Solves the perennial Zimbabwean problem of local eCommerce
- Resolves legacy reconciliation issues
- Reduces industry dependency and **forex** cost on expensive POS hardware
- Immediate access to 5 million registered Zimbabwean banked individuals through ZSS managed service
- Eliminates many legacy costs to institutions, merchants, and customers
- Allows Acquiring Institutions to convert merchant service departments from Loss making to Profit Centres
- Backwards integration compatible with existing institution's QR solutions and Mobile Apps
- More secure than card
- Works as a complimentary or alternative service to existing infrastructure such as standalone or integrated POS

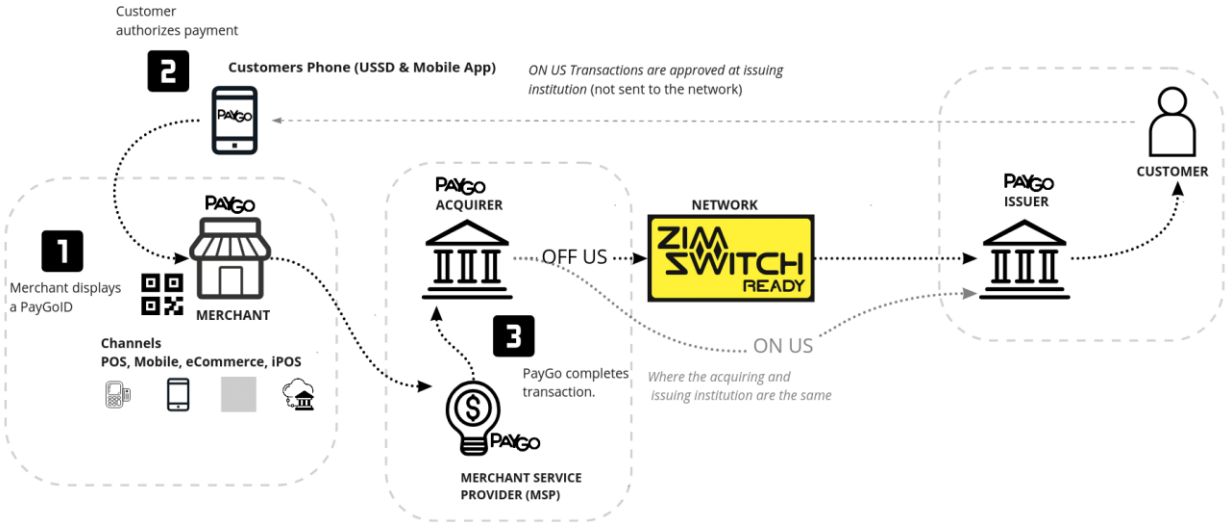
3) Commercials

PayGo is made available to the Zimbabwean market at no charge. **Zero additional transactional fees will be levied by ZSS to any participants of the PayGo service.**

- Existing ZSS customers
  - All new PayGo software and implementation is provided at no additional cost
- Non ZSS Customers
  - ZSS will provide basic supporting services to non-ZSS institutions at no charge
  - Third party software costs are for the account of the institution
- Traditional Zimswitch card-not-present switch fees will apply for off-us purchases

4) PayGo Architecture Overview

Diagram 1: PayGo Overview



5) Merchants

PayGo enables national level merchant payments across all merchant types with real-time reconciliation functionality:

LRE's – Large Retail Entities

- Supermarkets and larger merchants can integrate their existing till software directly in the PayGo Ecosystem through their Acquiring institution
- Dynamic payment details are presented at till as an alternative payment method to minimise customer or teller error

SME's and Micro Merchants

PayGo is compatible with all existing mobile devices that have access to the Internet including:

- Basic entry points Smart phones, tablets, iPads, laptops, desktops

eCommerce

PayGo supports seamless web site payment integration including:

- Magento, Biocommerce, Shopify, Wix, WooCommerce, Square Space

- Custom integration available through open specifications

PayGo Hosted Payment Portal

To simplify the integration process and assist with further reduction in cost and time to market, PayGo makes available, at no-charge, a Payment Portal for merchant utilization.

6) Acquirers

PayGo ensures that acquiring institution relationship and commercial arrangements with merchants are protected. The PayGo framework provides significantly lower cost and enables innovation for all merchants and acquiring banks alike. There is no vendor lock in, Merchant Banks are empowered to partner or build in-house, advanced merchant solutions to cater for their customers ever growing innovation requirements. . *(Merchant Services Commission or Merchant Discount Rate (MDR) as it is known in different markets, is a necessary incentive for banks to invest in acquiring business and become innovative while some banks who find acquiring investment expensive choose to remain as issuers.)* Removing MSC, is in the long run detrimental to bank innovation as banks will gravitate towards traditional acquiring, shying away from innovation in digital acquiring space. However, that is a business decision. Critically, **PayGo is agnostic as it supports both models – MSC or no MSC.**

MSP – Merchant Service Providers

The PayGo framework introduces a new concept in Acquiring services. The MSP layer empowers Acquiring Institutions and their technical partners to extend and build or integrate their own merchant management platforms and services as they see fit and in order to best serve their merchant banked customer base. By implementing virtual POS infrastructure with none of the associated hardware or physical management costs, service fees can be reduced, and service levels improved. A bank can elect to be a MSP or engage one.

7) AML, Fraud and CFT

PayGo transactions will be completely visible to each processing institution, ensuring all existing AML, fraud and CFT systems can continue to monitor for suspicious activity.

The extended PayGo dedicated AML, fraud and CFT systems provide an additional level of insights and exception reporting for ZSS members by utilising Artificial Intelligence driven and Complex Event Driven high volume transaction processing and real time monitoring.

8) Security

Highest levels of security are made possible by utilising the existing institutional mobile banking systems and protocols. Customers initiate purchase requests utilizing ‘step up authentication’ with their ‘mPIN’ through the secure mobile channel; this is analogous to next generation methods of 3D-Secure provided by major networks and Associations like Visa and Mastercard.

The customer ‘mPIN’ is secured with DUKPT (Derived Unique Key Per Transaction) Encryption on the mobile device (Remote Key Injection), based on device you have – GSM SIM Card - i.e., ‘Two Factor Authentication’ is achieved.

Leveraging the enhanced security features of modern mobile devices such as Apple’s Secure Enclave, and the Android Keystore, each person can uniquely identify themselves with biometrics, to unlock the devices secure storage for purposes of authenticating themselves with the Institution, providing

far greater security than pin-based access. In addition, this relationship with the customer is subject to a renewal process ensuring the device will expire and become untrusted if inactive for a prolonged period of time. This is best practice security feature in the developed world.

Geo location is provided (with customers consent) to allow for greater data driven risk assessment of transactions performed, this is only possible due to the customer's devices providing real-time location access enabling the issuing institution to perform advanced customer profiling.

In summary, PayGo purchases are considered significantly more secure than traditional card purchases.

Auth0 Step Up Authentication https://auth0.com/blog/what-is-step-up-authentication-when-to-use-it/

DUKPT Encryption https://www.futurex.com/blog/dukpt-in-point-of-sale-how-does-it-work/

9) Standards and Specifications

The PayGo is built around the industry best practice EMVCo QRCPS Specification (Merchant Presented) with enhancements to make it relevant to the domestic market.

EMVCo QRCPS https://www.emvco.com/wp-content/plugins/pmpro-customizations/oy-getfile.php?u=/wp-content/uploads/documents/EMVCo-Merchant-Presented-QR-Specification-v1.1.pdf

PayGo utilizes the acquiring institutions merchant acquiring infrastructure and permits off-us transaction by leveraging the institutions existing ZimSwitch interface.

For the full PayGo specification, please refer to the comprehensive technical specification documents:

I. paygo-zw-rest-api-protocol-specification-1.2.1-2.pdf
II. paygo-zw-rest-api-admin-protocol-specification-1.0.0.pdf
III. vsuite-bridge-api-protocol-specification-1.0.1.pdf

10) Settlement, Reconciliation and Reporting

Settlement

PayGo is in effect a virtual POS, meaning the existing settlement and reconciliation mechanisms available to the organization will continue to work for this payment method.

- Off-Us transactions are switched and settled through Zimswitch.
- On-Us transactions are switched and settled within the institution.

References

References play a key role in the PayGo transactional life cycle, allowing any single transaction to be identified across the any separate systems it traverses. PayGo provides a Payment Reference which correlates all legs/transactions of the payment. This is a unique reference based on a IETF UUIDv4 random number which has extremely high entropy.

IETF UUID https://datatracker.ietf.org/doc/html/rfc4122

Reporting

PayGo provides standard recon reports to each participant Issuer bank (PSP) & Acquiring bank (MSP), for all payments processed such as, P01 (Payment Summary) and P11 (Payment Detail).

Appendix 1: Questions and Answers

Can Acquiring institutions still control and charge MSCs?

- Yes – the Acquiring Institution and MSPs have complete control of the merchant relationship. In fact, margins are higher, providing latitude to negotiate with merchants, due to elimination of infrastructure costs. PayGo is limited to an enabling role.

Is PayGo Secure?

- PayGo provides a framework to enable the highest possible levels of security made possible by leaning on the inherent security of mobile banking platforms. It is widely accepted by the industry at large that mobile initiated payments are more secure than even the highest levels of EMV cards

Does PayGo comply with SI80?

- PayGo is compliant with SI80

Does PayGo utilise industry best practise standards?

- PayGo is designed with all levels of industry best practise

How much will it cost my institution to integrate to PayGo?

- There are no additional ZSS costs for integrating PayGo

What are Static and Dynamic merchant codes?

- Static codes present merchant details only. Dynamic codes are unique to each payment and include details of the amount to be paid. Dynamic codes make payments in high volume locations such as supermarkets much faster and convenient as the customer does not need to manually enter the amount.

Does PayGo interfere with existing iPOS or standalone POS infrastructure?

- No. PayGo is a complementary and alternative payment method that runs completely independent of existing POS infrastructure.

Can existing iPOS and standalone POS be extended to accept PayGo payments

- Yes. All POS hardware platforms can be extended to accept PayGo payments.