Mobile Money in Zimbabwe: Integrating Mobile Infrastructure and Processes to Organisation Infrastructure and Processes

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The emergence of mobile money in Zimbabwe has proved very popular as organisations across sectors try to develop and package the product. This research, carried out through case study and desk research, seeks to establish whether and how the organisations involved meet the operational integration component of the strategic alignment model. Specifically operational fit between organisational and mobile infrastructure and processes through determining mobile money infrastructure and processes and the associated organisational infrastructure and processes within a mobile money ecosystem. The research established that a number of institutions have tried to redesign and repackage the product, but not all were successful. The failure was attributed to improper alignment between the available technologies and organisational processes and infrastructure. The research further exposes that operationally integrated organisations ensures that alignment components involved are adequate and well reinforced through adequate governance structures, however skills does not necessarily have to be adequate but must be present.

Key words: Mobile money, mobile infrastructure, mobile processes, functional alignment, operational integration.

INTRODUCTION

The ubiquitous and location sensitive nature of telecommunication products like mobile phones, have made mobile services possible. Thus mobile commerce and mobile business now tend to be the order of the day. Mobile banking; defined by Tiwari et al. [1] as the provision and availing of banking services with the help of mobile telecommunication devices - is changing the face of banking, especially in Africa. Thus through aligning banking business strategy, process and infrastructure with information and communication technology (ICT) strategy, mobile processes and infrastructure such as imaging, GPS/GPRS, RFID, etc coupled with ‘smart handsets’ capable of providing various functionalities [2] has made mobile banking a success and motivated customer tastes and preferences to be on the move. To maintain or boost market share and customer satisfaction banks have also kept an eye on events in the telecommunications industry.

This has seen the emergence of mobile money in Africa, which was first launched in Kenya in 2007 and is spreading throughout African countries. Mobile money which is simply the ability for cell phone users to transfer money from one subscriber to another as well as withdrawing cash from appointed mobile money agents [3], has greatly helped Zimbabwean people whose country is facing liquidity challenges through facilitating transactions in the financial sector without the need for Bank account and queues. Just owning a cell phone now transforms one’s life into this new financial circuit/network.

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Considering the dynamic nature of ICT and its contribution to business growth and prospects, which later translate to national development and prosperity, the aim of this research is in threefold: (1) to study and examine the status of mobile money in Zimbabwe through a number of case studies in the mobile money business; (2) to establish operational integration components of the strategic alignment model with particular reference to mobile money ecosystem; and finally (3) to establish and evaluate the causal conditions and configurations as well as the associated outcome for operational integration. The section that follows in this paper discusses the relevant previous work on mobile money and operational alignment, followed by an outline of research materials and methods used in this research.

Literature Review

This section critically reviews literature on mobile money, starting from the definition down to the mobile money ecosystem; narrowing down to the underlying technologies and processes. Mobile money components and technologies are also critically reviewed. This critical review of literature forms the basis for an evaluation of the work that has already been done in the broad field of mobile money gradually narrowing to mobile money and organisational infrastructure and processes. It further demonstrates the relationship that exists, between published research findings and the research question, highlighting any bias or omissions. This review of literature demonstrates how far existing work goes in answering this research question through a comprehensive review of available and relevant literature [4]. Critical literature reviewing according to Saunders et al. [5] provides the foundation on which research is built. Saunders et al. [5] further argued that critical refers to the judgment that one exercises after reading related work.

What is mobile money?

Money used to move from one point to another through traditional channels, thus from hand transfer to postal services and bank transfers. This service now seems to have been snatched by emerging technological trends. Money used to be sent to a particular location now it is sent to a particular individual irrespective of their location. This new phenomenon known as mobile money (m-money) has been defined by many authorities with some of the definitions given below;

United Nations Conference on trade and development (UNCTAD) in 2012 defined mobile money loosely as “money stored using the SIM (subscriber identity module) in a mobile phone as an identifier as opposed to an account number in a conventional banking”. Must et al. [6] further added that subscribers add value to their mobile accounts and store it for future use (money transfer or payment for goods and services). A mobile phone is used to transmit transfer or payment instructions deducting from value stored on the SIM, linked to the equivalent real cash value safely held elsewhere, normally in a bank [7]. Jenkins [8] concurred that mobile money is accessed and used via mobile phones, highlighting that mobile subscribers in African markets are beginning to use mobile money for a variety of transactions and services domestically and internationally. LIRNEasia [9] agreed with Jenkins on customer connection using mobile phones further highlighting the fact that the customers may be banked or unbanked.

These definitions have highlighted the significance of mobile phones in the processes associated with mobile money. Therefore mobile money services are better offered through telecommunication companies [9]. Mobile phones are turned into virtual bank accounts, resulting in the expansion of financial services to the unbanked poor [10,11]. Though mobile banking requires meaningful investment in ICT, Financial institutions have derived immense benefit through reduction in operational costs, customer loyalty creation and increase in banking penetration as well as meeting government service obligations, etc. [12,13].

Overview of Mobile Money in Zimbabwe

Recently, mobile money arrived in Zimbabwe triggering a lot of activity as telecommunication and banking institutions scramble for their share of the mobile financial products [14]. Table 1 illustrate some of these products in Zimbabwe. Mobile money transfer (MMT) which emerged as a subscriber to subscriber airtime transfer, is still being used by lower income groups for barter trading with other products, was later used as proxy cash [15], and has seen light in Zimbabwe. Arguing on the basis of technological ubiquity and the lower cost nature of mobile money transfer services, Merritt [16] highlighted that remittances are being dominated by wireless carriers showing a steady shift from traditional providers.

In Zimbabwe, Econet’s EcoCash with an agent network of over 1000, provides a cell phone to cell phone quick, easy and secure money transfer. Zimbabwean state-owned mobile network operator Net One has also

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<td>Econet Wireless</td>
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Table 1. Mobile money products in Zimbabwe.
Figure 1. Level of mobile money transfer in Africa (Adapted from [17]).

Figure 2. Subscriber statistics as of March 2012: (Adapted from [18]).

Figure 3. Typical SIM Cards and SIM Chip structure and packaging.

launched its mobile money transfer services under the ‘OneWallet’ brand. Approx 1, 1 million people in Zimbabwe have a bank account (9% of the total population). Over 70 out of every 100 people have a mobile phone and ownership is expected to reach 100% by 2015 hence the opportunity for Mobile Money [19].

Figure 1 shows the level of mobile money transfer in Africa with Zimbabwe being at level one and other countries like Kenya are at level three showing high levels of implementation. Though Zimbabwe is at level one it is on a high growth trajectory [19].

Aligning Mobile and Organisational Infrastructure and Processes

Networks of organisations and individuals as well as appropriate infrastructures and processes must be in place and be well aligned for mobile money to take root, proliferate and go to scale [8]. This network constitutes a mobile money ecosystem which is a community supported by a foundation of interacting organizations and individuals to achieve a certain goal [7,8]. Participants and stakeholders in the mobile money ecosystem include mobile network operators, equipment manufacturers, regulators, banks, airtime sales agents, retailers, utility companies, employers, other institutions, and users. This section seeks to review mobile and organizational processes and infrastructure in Zimbabwe and try to see how well they integrate operationally into the Strategic Alignment model by Henderson et al. [20].

Mobile Infrastructure

Advances in and the ubiquity nature of mobile technology associated with declining ownership costs have enabled alternative functionalities for mobile handsets far beyond the architects’ and designers’ original visions. This has been the backbone for emerging mobile financial services, ranging from person to person (P2P) transfers to payments for purchase of goods and services [16]. Mobile infrastructure is provided by mobile network operators, equipment manufacturers and platform providers including a wide array of stakeholders like mobile phone makers and vendors, network equipment vendors as well as application providers. In Zimbabwe there are three major mobile operators Econet, Net One and Telecel. Their market share as of March 2012, determined by subscriber base is illustrated in Figure 2.

Subscriber Identity Module (SIM) Card

A Subscriber Identity Module (SIM) card together with its structure is a portable memory chip illustrated in Figure 3, commonly used in mobile phones handsets that operate on the Global System for Mobile Communications (GSM) network. The SIM card has the capacity to holds mostly personal information of the subscriber. Such information include text messages, phone number, address book and other relevant data. SIM cards are designed to meet a high level of security requirements, as well as mechanisms to enhance anti-cloning and speed. Through the SIM Application Toolkit the SIM card independently initiates its commands [21] other than handset and network commands.

SIM Application Toolkit (STK)

SIM Application Toolkit (SAT or STK) is a technology that lets the SIM card execute a great variety of additional applications [22]. It is a set of commands which outline how the SIM card should interact with its environment and extends the communication protocol between the card and the handset.

Figure 4 shows the interaction between a cell phone handset and the SIM card. Being feature-rich, the STK
(SIM Toolkit) card can be used by any GSM operator to deploy a host of applications and value-added services for their subscribers via the SIM card.

**SMS Technology**

Text messages which comprise of numbers, words or alphanumeric combination are sent and received by subscribers through Short Message Service (SMS) technology. Any short message has a maximum length of 70 characters for non-Latin alphabets (e.g. Chinese and Arabic) and 160 characters for Latin alphabets. The message can be sent even if the phone is inactive or out of range. A return message is received by the sender notifying that message has been delivered or not. The SMS has a store and forward facility that is handled through the Short Message Centre (SMC). As reference [23] put it the Short Message Entity (SME) is usually located in the mobile station or fixed network. It receives and sends the message. The Network elements that support SMS in a GSM network are shown in Figure 5.

The Mobile Switching Centre (MSC) is the point of contact with other networks. While the Home Location Register (HLR) is the main database in the mobile network; which hold such information as subscription profile, subscriber routing etc. Visitor Location Register (VLR) holds temporary subscriber information required by MSC. It minimizes queries made by MSCs to the HLR. Base Station System (BSS) consist of transceivers which send and receive information to and from the mobile station (MS). NRI [24] argued that the introduction of standardized protocols such as STK and the Wireless Application Protocol (WAP) contributed to an increase in messaging usage by providing a standard service development and deployment environment for application developers and business partners. The protocols also made it easier for users to reply to and otherwise access messaging services through custom menus on the phone [24].

**USSD Technology**

Unstructured Supplementary Service Data (USSD) defined by TelecomSpace [25] as a simple and handset independent real time and instant GSM network messaging service that provide for fast communication between the user and an application as supported by Sanganagouda [26] who argued that USSD is almost seven times faster than SMS, further highlighting that it is highly cost effective. This technology technically and functionally resembles SMS Services, built on USSD also resembles Interactive Voice Response (IVR) systems. The major notable difference being USSD not involving voice channels to establish connection between service and subscriber terminal. A typical USSD message has a code format which starts with an asterisk (*) followed by a combination of digits (0-9) that comprise commands or data. Codes may be separated by additional asterisks to form multiple requests as Sanganagouda [26 p.3] argued. The message is terminated with a number sign (#) [25].

Figure 6 shows elements of a USSD mobile network. Some of the elements are similar to those of SMS. USSD differs from transaction-oriented, store and forward SMS technology in that it is dialog or session oriented and thus has a faster turnaround response time for interactive applications, thus making it possible to support a number of applications like callback services, mobile chatting, mobile banking and a lot more. This mechanism according to Maklakov [27] results in fast performance, usually unattainable with applications, built, on SMS platform. Maklakov [27] went on to argue
that USSD does not compete directly with SMS but supplements the former, allowing operators to reap the benefits of both technologies. USSD is supported by both WAP and STK protocols.

**Mobile Money Platforms**

Mobile money platforms provides mobile money transfer services, bill payments, airtime top up, authentication, balance inquiry and other payments. Examples of existing platforms are Fundamo, TagPay, Obopay and Sybase 365. Comviva’s mobiquity used by EcoCash and Gemalto used by OneWallet. Comviva’s mobiquity platform embraces the mobile phone as a cash-free, convenient as well as card-free medium for financial transactions, which provide a variety of payment services for goods and services. Mobiquity provides an end-to-end standalone financial and payment solution catering for the needs of both banked and unbanked customers. It is a fully functional and secure mobile wallet account which enables users to transact from their mobile phones. The platform maps to any distribution hierarchy in order to provide last mile financial access for cash-in and cash-out services [28].

NetOne launched its mobile money transfer services under the OneWallet banner, which is based on a platform provided by Gemalto. The platform also enables salaries or wages to be paid directly into mobile accounts, a scenario employed by some organisations, usually non-governmental organisations with employees in remote parts of Zimbabwe. Net One intends to work with other organisations including the government to allow OneWallet to be used for automatic pension payments. The functionality would help bring banking services to people in even the remotest areas of Zimbabwe. On the other hand EcoCash, the mobile money platform of Zimbabwe’s leading mobile network operator, has shifted from its initial platform supplied by South African vendor Pattern Matched Technologies to Comviva, of an Indian origin. The new platform known as Mobiquity is a hosted Software-as-a-Service (SaaS) model, which will provide the best services to customers. Adopted globally by over 55 leading banks and mobile phone operators [29], the Mobiquity mobile prepaid wallet functionality provides an end-to-end stand-alone financial solution catering to the needs of both banked and unbanked customers.

Other features include a bulk payments facility which will allow payroll and aid distribution directly to EcoCash wallets, international transfers of money to EcoCash wallets, and a direct integration with banks to allow the seamless transfer of value from a customer’s bank account to their EcoCash wallet and vice versa. The migration paves way for the introduction of an over-the-counter merchant payment functionality which allows EcoCash customers to pay for their retail purchases using EcoCash, the company said in a press release. Launched on December 2011, EcoCash already has surpassed 1.5 million registered subscribers. Econet also owns TPS, which operates majority of the country’s credit card terminals that already accept Visa, MasterCard and American Express cards [30].

**Supporting Technology**

Supporting technology covers integration, general support and basic infrastructure. Integration Technology allows financial institutions, and other related institutions, including merchants to link to one or multiple mobile money services. Furthermore this technology automates use of mobile money services by small and medium size enterprises. General Support Technology includes Cloud Services, Service Oriented Architecture, as well as Cyber Security. Basic infrastructure covers physical and financial infrastructure that supports mobile money.

The physical infrastructure includes Mobile phone, Mobile network coverage and electricity. The growth of mobile commerce is directly related to the increase of ownership and use of mobile communication devices which including personal digital assistants (PDAs) and mobile phones. These devices provide effective authorisation and management of payment and banking transactions since they are capable of offering security and convenience advantages compared with existing methods, among them debit/credit card transactions as well as online payments through a personal computer. Financial infrastructure covers, financial switches and clearing houses necessary for mobile money to be implemented. In Zimbabwe Econet has created a dedicated Call Centre and Service Centres for EcoCash customer support. These centres are as shown in Figure 7.

**Mobile Money Transfer Processes**

By simply registering and depositing money one would have created an electronic wallet (e-wallet) or virtual bank which can allow one to carry out a number of transactions as long as money is available in the e-wallet. E-wallet has been beneficial to small businesses which can operate more efficiently and cost effectively in competitive environments by uploading their e-wallets then make quick payments for their raw materials and other services. Subscribers can through cash-in process send
money to their intended receivers irrespective of their actual location or receive through cash-out processes. These processes are carried out through mobile money agents as illustrated in Figure 8.

**Mobile money services fall into three broad categories:**

**Money transfer (M-transfers)**

M-transfer is where money is transferred from one user to another, normally without an accompanying exchange of goods or services. These are also referred to as Person-to-Person (P2P) transfers and may be domestic or international. Domestic m-transfers however dominate amongst the mobile money services in Zimbabwe and even across East African Community [7]. The bulk of these transactions occur between urban and rural areas, as migrants to urban areas send money back to the rural areas to support their extended families [31]. In this case, mobile money replaces traditional informal methods like sending money with someone or by bus. Part of the success of mobile money is attributed to the lack of scale and reliability of informal methods [32]. For example; consider a scenario where a person needs to urgently send money back to his or her village. This previously required finding an individual that could be trusted, who was travelling to the relevant village and at the appropriate time (i.e. when the need arises). This individual should also know the recipients of the funds and be willing to pass by their home or link up with them to deliver the money. When considering that the person sending the money will most likely in any event use a mobile phone to call ahead to alert the relatives about the impending delivery and factoring in issues of reliability, security and speed; then mobile money seems glaringly straightforward [7].

**Mobile payments (M-payments)**

Under M-payments money is exchanged between two users with an accompanying exchange of goods or services. From m-transfers, mobile network operators (MNOs) have broadened mobile money services to include a range of m-payments. MNOs started out by targeting entities that receive recurrent payments from diverse customers like utility companies (e.g. power, water, sewage, Pay TV, etc.) and those that make bulk payments (e.g. salaries and school fees). To date, the biggest m-payment beneficiaries are the MNOs themselves through the sale of airtime or credit directly to consumers. This avenue to sell airtime is helping them to make significant savings through bypassing the traditional distribution system of scratch cards. MNOs save by avoiding the need to print new cards and pay commission to dealers and their agents [33]. The margins of many small mobile sector enterprises that thrive on the distribution of airtime could come under increasing pressure as MNOs work to sell more airtime through this virtual channel [7].

**Mobile financial services (M-financial services)**

M-financial services is where mobile money may be linked to a bank account to provide the user with a whole range of transactions (savings, credits) that they would ordinarily access at a bank branch. In other cases, users can access novel financial-related services like insurance, micro-finance, and many more via their mobile phones. Some transactions span different service categories, for instance a user can access his or her bank account and transfer money to another bank account holder or mobile money wallet without an accompanying exchange of goods or services. This entails both m-transfers and m-financial services.
Currently, mobile money transactions can be local (within the jurisdiction of one country) or international (across different national borders). International money transfers by Western Union in partnership with M-PESA are an example of the latter. While banks initially shunned mobile money, many have recognised the potential it has and some have even signed up as super agents for mobile money services. In Kenya and Uganda, it is now possible for mobile money users to withdraw money from some ATMs instead of visiting a mobile money agent. While this approach guarantees more liquidity, it only works in urban settings where ATMs are common.

The processes associated with mobile money transfer include cash in processes; cash transfer process and cash out processes. These processes are illustrated by a simple diagram shown in Figure 8.

The key entities that actively participate in mobile money transfer processes are retailers and one or more entities out of the rest of the six listed below:

1. Mobile money agents (Cash-in/ Cash-out retailers)
2. Banks
3. Mobile network operator
4. Handset and application vendors
5. Regulator
6. 3rd Party Money transfer enablers

The processes in Figure 8 are highlighted in Figure 9, showing processes associated with TagPay which is a mobile money transfer platform. With TagPay one can instantly turn any phone into a means of securing electronic transactions. This platform’s architecture is specifically designed for mobile payments and includes many critical features. TagPay can function autonomously or be seamlessly added to existing payment schemes.

The business models depend a lot on the regulatory freedom given by the central bank and telecoms regulators. There are essentially three prevalent business models in the field of MMT depending on who is leading:

1. MNO-led model e.g. EcoCash, One Wallet and Skwama
2. Bank-led Model
3. Third-party-led model
4. A combination of two or three of the above stated models.

**Organisation Infrastructure**

Although mobile phones are central to all these uses, mobile money is more than just technology. It needs an infrastructure for cashiering in and out, usually accomplished through a network of “cash merchants” (or “agents”), who receive a small commission for turning cash into electronic value and vice versa. This brings in the other component of the Strategic Alignment Model, which is the organisational infrastructure, generally referring to the basic physical and organizational structures and facilities needed for the operation of a society or enterprise. Organisational infrastructure is important because the use of new technologies is dependent upon a robust infrastructure.

Several players and stakeholders who play different roles or derive diverse benefits from the whole mobile money transfer ecosystem, are required for a typical mobile money system to operate and these include:

(a) A Mobile money operator (MNO) who provides the mobile infrastructure and customer base that is already
using its communication services as well as ensuring compliance with telecommunication regulations and policy within the country. The mobile network operator fills the role of leading in the ecosystem, providing the basic infrastructure for the payment system and oversight for the agent network [8,16]. In Zimbabwe there are three MNOs who are Econet Wireless, Net One and Telecel. MNOs potentially benefit from mobile money by increasing and maintaining the number of customers, reducing the cost of airtime distribution and by generating new revenue [7].

(b) A bank or other financial institution with banking license and infrastructure that enables the exchange of money between different parties. These also provide oversight and regulatory compliance with national financial regulations and policy. Banks can leverage mobile money platforms to reach more people in traditionally underserved areas with their services at much lower cost, [7] as well as handling cross-border transactions, manage foreign exchange risk [8]. In Zimbabwe a number of banking institutions exist and all have introduced mobile banking products. Such products include CABS Bank’s Textacash, Kingdom Bank’s Cellcard, Tetrad’s eMali, CBZ Bank’s Mobile Banking, Interfin Bank’s Cybercash, among others [14].

(c) Regulatory institutions across different sectors, which provide an enabling environment for mobile money as well as protecting the stability of the financial system [8]. The key regulators in Zimbabwe include The Reserve Bank of Zimbabwe for the financial sector and Postal and Telecommunication Regulatory Authority of Zimbabwe (POTRAZ) a telecommunication regulators for the communications sector.

(d) An agent network (of people, automatic teller machines (ATMs), branches) that facilitates cash-in (converting cash into mobile money) and cash-out (issuing cash on demand) [8] to afford convertibility between mobile money and cash [7]. MNOs in Zimbabwe have developed extensive agent networks to sell airtime and other products while those of the banks tend to be limited to urban or highly populated areas. Agents earn commission on various transactions carried out by mobile money users. Econet’s EcoCash has an agent network of over 500 countrywide making it the largest mobile money transfer institution in Zimbabwe. NetOne also announced a partnership with local bank FBC, and local software development firm Afrosoft in offering the service. It also announced on launch that Zimpost will be a key partner in extending the reach of OneWallet services countrywide. Zimpost is Zimbabwe’s state owned postal service company with a branch network of about 300 offices and therefore serves as a strategic partner in launching a mobile money product promising banking to the unbanked. Zimpost being a natural partner for NetOne was a division in Post and Telecommunications Corporation (PTC) together with NetOne before it was unbundled into four separate entities namely; the People’s Own Savings Bank, Zimpost, TelOne and NetOne. It’s not difficult to imagine NetOne’s mobile money solution being one easy for subscribers to adopt painlessly, especially those with the existing need for a local money transfer service. NetOne’s expansive network coverage also works in its favour here. The company has mobile network coverage only rivaled by the largest mobile operator by subscriber numbers, Econet [38].

(e) Equipment manufacturers and platform providers include a wide array of stakeholders like mobile phone makers, network equipment vendors as well as application providers. These benefit from the increased sale of end-user devices like mobile phones, equipment to handle increased network capacity and fees or subscriptions respectively [7].

(f) Mobile money users are normally subscribers to an MNO’s other services. Users derive benefits by getting cheaper and more efficient means of transferring or paying money to other people or businesses within the network. [7].

Other players who play active roles in mobile money ecosystem who are not yet very active in Zimbabwe are:

(a) Merchants and retailers, who accept mobile money payments in exchange for different products and services. They help increase demand for mobile money by offering more avenues through which users can spend their mobile money. In return, they can minimize the need to handle cash [7].

(b) Businesses that utilize mobile money as a means to deliver their services, i.e. MFIs, insurance providers, as well as large-scale disburbers and bill issuers [7]. The interaction of all above listed players and stakeholders is presented diagrammatically by Jenkins as shown in Figure 10.

Figure 11 illustrates mobile money ecosystem in Zimbabwe from EcoCash perspective. For mobile money transfer to be effective these players and stakeholders need to be properly organized so as to ensure that they effectively and efficiently carry out their roles. It is also important to note that appropriate skills and administrative resources are readily available to ensure these institutions are able to execute their roles properly.

EcoCash is almost similar to Netone’s One Wallet however the key difference is that the later is SIM based and doesn’t allow money transfers to other mobile networks. The EcoCash mobile money service is USSD based and because of that it doesn’t require subscribers to swap in their SIM cards [40]. EcoCash is a cross network transfer service, thus money can be transferred to a non-Econet mobile subscriber.

Telecel also has a mobile money service under the Skwama trademark. Both Skwama and One Wallet have struggled to gain traction mainly as a result of the fact that the majority of mobile subscribers are on the Econet
network. Econet could attract even more on the back of EcoCash if its two competitors do not respond effectively [40].

Organisational Processes

A process is a specific group of activities that is of value [41]. Organizations are looking for ways to respond to competitive pressures and new performance levels by redesigning and continuously improving their production and operational processes [42].

Business process design involves the identification and sequencing of work activities, tasks, resources, decisions, and responsibilities across time and place, with a beginning and an end, along with clearly identified inputs and outputs. Processes must be able to be tracked as well, using cost, time, output quality, and satisfaction measurements. Businesses need to monitor, review, alter, and streamline processes continually in order to remain competitive. A process view of the organization differs from the traditional functional view [41].

The process indicators represent the “metrics” for measuring the core processes. One of the process indicators for the customer service process is gauging customer satisfaction levels [41]. Organizing, like planning, must be a carefully worked out and applied process. This process involves determining what work is needed to accomplish the goal, assigning those tasks to individuals, and arranging those individuals in a decision-making framework (organizational structure). The end result of the organizing process is an organization - a whole consisting of unified parts acting in harmony to execute tasks to achieve goals, both effectively and efficiently [42]. A properly implemented
organizing process should result in a work environment where all team members are aware of their responsibilities. If the organizing process is not conducted well, the results may yield confusion, frustration, loss of efficiency, and limited effectiveness. In general, the organizational process consists of five steps (a flowchart of these steps is shown in Figure 12).

Mobile money transfer requires the design of varying activities or tasks so that they interact efficiently and effectively. The role of each player within the mobile money ecosystem must be clearly spelt out so that duplication of roles is eliminated. This is done through identifying the critical roles: group related ones and assigns them to the appropriate player in the ecosystem. Functional roles must also be identified thus administrative, human resources, financial, marketing, operational roles must be clearly laid out, and this will result in operational departments. Delegation of duties must be done to ensure effectiveness, thus departments should have clear responsibilities and should be accountable to senior management. The correct span of management should be put in place within departments and also this should be applied to agent management.

Marketing Processes

The most important assets that mobile network operators bring to the mobile money business are powerful brands [43]. However, operators vary in the extent to which they leverage their brands. Generally, customers are most comfortable with mobile money sub-branding that is related, but clearly differentiated, from the operator’s core brand identity. When the mobile money brand is barely distinguishable from that of the operator, it becomes difficult for users to identify at which agents they are able to perform mobile money transactions (as opposed to purchasing airtime). At the other end of the spectrum, when the mobile money branding departs too radically from that of the operator, then the opportunity to capitalise on the strength of that core brand is missed. In Zimbabwe such mobile money brands as EcoCash and One Wallet conform to a differentiated but MNO related. However Skwama moved away from this branding principle. Visibility aids EcoCash in its market domination. EcoCash markets its services through advertisements on public mini-buses, known as kombis, in urban areas, and over radio talk shows in rural areas. Widespread marketing helps keep EcoCash ahead of other, smaller competitor [12,44].

Liquidity Management Processes

This is also one important process as solving the liquidity management challenge is one of the next big issues facing mobile money providers around the world [45,46]. This is the pillar of customer support, thus efficient liquidity management boost customer confidence. Mobile money transactions between a retail agent and a customer require that the retail agent has cash value in their mobile wallet [45]. The agent provides financial services throughout the day, resulting in cash fluctuations on their phone, depending on whether they are accepting funds or paying out. When the amount in the retail agent’s mobile wallet is used up, the agent cannot perform additional services and needs to refill their account. If the agent does not have a bank account linked to their mobile wallet, this means they need to make a trip to the bank to transfer cash into electronic value [45].

Agent Training

Well-trained agents are the first line of defence against various types of fraud or abuse. One outcome is a network of agents who consistently adhere to regulatory processes, which virtually eliminates the opportunity for customers to obscure their identity when transacting.

Scrutinise Pricing and Commission Models

When designing their pricing and commission models, prudent operators spend time considering the various ways that an unscrupulous agent or customer might attempt to ‘game’ the system and try to minimise
opportunities for such abuse.

**Functional Integration**

There has been an effort to try and establish relationships between IT investments and increased productivity [47], effectiveness [48] and efficiency. These efforts have been made at national level where researchers failed to establish significant relationships and at firm level where the results were somewhat mixed [20]. This highlights the significance of IT investment and management relative to overall business investment [20,49].

This section seeks to outline the functional integration between business and IT domains [20] more specifically operational integration [50]. From mobile money transfer perspective it can be seen that vast and accelerated investments in ICT have been realized, the main challenge is the realization of the benefits from them [20] and whether the components of alignment are identified and are in harmony.

Figure 13, highlights part of the strategic alignment model that is the focus of this research. The shaded boxes illustrating organisational infrastructure and processes and IT infrastructure and processes. Chevez [50] also agreed with Henderson et al. [20] on functional integration and its components; strategic integration and operational integration, as shown in Figure 14. It further highlights operational integration and its components which include information systems infrastructure and processes and organisational infrastructure and processes.
Table 2. Below illustrate research methods and techniques used.

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<td>Abstract and abstract guides, content analysis</td>
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<td>Case study</td>
<td>Case selection</td>
<td>Stratification, random selection</td>
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<td>Data collection</td>
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<td>Observation, interviewing Business and IT Staff</td>
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<td>Case chronology</td>
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<td>Internal &amp; external document analysis</td>
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<td>Comparative analysis</td>
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<td>Causal condition identification and streamlining</td>
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<td>Truth table construction and analysis</td>
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<td>Comparative analysis tools</td>
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<td>fsQCA analysis software</td>
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It is important for organisations to successfully distinguish strategic and operational integration. Operational integration encompasses all the infrastructure and processes from an organisational and technological perspective. Proper identification of these will help in aligning processes and infrastructure. The next section outlines materials and methods used in this research.

**METHODOLOGY**

Research methodology refers to procedures that are used by researchers in making systematic observations or otherwise obtaining data, information, or evidence as part of a research project or study designed to get new knowledge and advance professional knowledge base [51]. This section covers the research approach that has guided the present research work (Table 2).

The methods used to carry out the study included:

(a) Library/Desk research to gather data from a variety of online resources, including websites of different industrial associations, regulators, operators, financial institutions and other mobile money stakeholders in Zimbabwe.

(b) Case studies approach was used to augment the desk approach with 24 cases analyzed. Three mobile operators, 17 financial institutions, telecoms regulator and three mobile equipment suppliers were studied. The universe to be studied comprise of all banks, telecom companies, mobile equipment suppliers and telecom regulatory authority in Zimbabwe. To ensure that the sample is representative of the whole population the organizations was grouped into strata. Each stratum comprises organizations offering the same services or has similar characteristics. Thus the final strata consisted of the mobile operator stratum with three elements (Econet, NetOne and Telecel), the financial stratum comprising all banking institutions in Zimbabwe, regulator stratum comprising (POTRAZ) and mobile equipment suppliers’ stratum. Elements from the mobile operator and regulator strata will all be included in the sample. However the financial and mobile equipment supplier strata comprise of many elements which are geographically dispersed in the country, in view of this and the associated cost of studying all the elements were randomly.

(c) Functional integration assessment, which involved looking at current infrastructure and processes from organizational and technological perspective and determines whether the technology employed best fit the organizational requirements and result in the intended outcome.

(d) The Strategic Alignment Model Adopted from Henderson *et al.* [20] was used to help assess functional integration between organizational infrastructure and processes and ICT infrastructure and processes.

The next section analyses results obtained through data collection methods employed. Operational integration and case analysis was done to establish the integration components and the causal configuration of integrated
organizations.

ANALYSIS OF RESULTS

Mobile money really exist in Zimbabwe and it’s on the increase as witnessed by its broadened functionality which started as a mere money transfer platform to now being a mode of payment for almost all goods and services including wages payments. This section gives a cross sectional outline of the results of the research. It initially outlines the components of functional integration more specifically operational integration and the resultant infrastructure and processes inherent in the Zimbabwean scenario. Thus its component has its sub components inherent in the mobile money ecosystem in Zimbabwe. Though the list of the sub components might not be exhaustive it is illustrative of the building blocks of a typical mobile money ecosystem. The analysis of results also went a step further to analyze whether organizations involved are satisfying the operational integration component of the strategic alignment model. Figure 15 shows how the components of operational integration fit into the strategic alignment model. Four categories were listed, which are organisational infrastructure, organisational processes, mobile infrastructure and mobile processes. This helps to clearly see the composition of each relative to other components.

Mobile infrastructure comprised of enabling technology, supporting technology and the regulatory framework. The enabling technology includes SIM card, application toolkit, SMS technology, USSD technology, mobile money platform. Support technologies help involved institutions to link together and even to other services which form part of mobile infrastructure. Processes in mobile money transfer ecosystem can be classified into three groups which are illustrated in Figure 16.

Pre transfer processes encompass all preparatory processes that are involved before the transfer is affected. Transfer processes on the other hand include all processes involved in the actual transfer; some of the processes include cash in, money transfer and cash out. The final batch of processes was referred to as post transfer processes which covers all processes involved after the transfer has gone through. Organizational processes are driven by organizational infrastructure as much as mobile processes are driven by mobile infrastructure.

These sub components have been well discussed under literature review, giving a clear understanding of what are they and how they operate to advance the requirement of mobile money ecosystems. A careful study of these components shows that their operation must be in harmony or state of fit to ensure successful
integration between them.

Case Study Analysis

Case studies are increasing in relevance as a research methodology [52]. This section analyses results from case studies which were studied. This study first discusses the validity and reliability issues encountered during the use of case studies as a research method and how these were addressed in this research. It then proceeded to fuzzy set qualitative comparative analysis, were it used the truth table approach to analyze the cases.

Validity and Reliability

It is important to consider threats to validity and reliability when using case studies as a research methodology. Such threats come in the form of data overload usually brought by multiple cases and generalisability problems brought by single case analysis. Usually multiple cases improves external validity achieved through methods replication, thus if results are replicated in multiple case studies, then they are more robust [52]. Some of the threats were addressed during the design stages by ensuring consistency in data collection through adequate interviewer training. The other approach was adopted to ensure validity is through triangulation, thus multiple research methods was employed for data collection and analysis.

Truth Table Approach

This approach for case study analysis uses Boolean algebra to classify certain events and search for patterns within and across cases [52 p.5]. Truth tables are important in pattern analysis for case similarities and differences, which in turn help us to distinguish operationally integrated or aligned cases from those that are not.

Operational Integration Components

The initial stage of case analysis involve component identification was identified, ICT Infrastructure, ICT processes, Organizational infrastructure and Organizational processes which are the operational integration components of the strategic alignment model. These were analyzed together with two alignment indicators which are ICT skills and ICT governance. Skills and governance issues were considered because they form the human resource component which was not explicitly included in the Strategic Alignment Model. Human effort, taking into account all levels of management is important in ensuring proper ICT-business alignment [53].

The next stage involves identifying the causal conditions and their associated outcomes. The components identified in the initial stage forms the causal conditions and were labeled component A through F. Operational integration denoted by (Y) is the outcome. The data gathered for the causes and the associated outcomes is illustrated in Table 3.

i. Component A = Adequacy of ICT Infrastructure
ii. Component B = Adequacy of ICT processes
iii. Component C = Adequacy of Organisational Infrastructure
iv. Component D = Adequacy of appropriate Organisational Processes
v. Component E = Adequacy of ICT skills
vi. Component F = Adequacy of ICT governance

![Figure 16. Mobile money transfer process classification.](image-url)
In the component or outcome columns the number 1 indicate satisfactory presence of the component while 0 indicates the absence or unsatisfactory presence of a component in the organization. Since fuzzy set analysis uses values in between shows the increasing intensity of the causal factors was moved from 0 to 1, this is illustrated in Figure 17. Each case study is a logical combination of causal components which linked to a particular outcome. The outcome (Y) shows whether the case being studied is operationally integrated or not and is given by the associated causal configuration.

After a satisfactory identification of a set of causal conditions for a particular outcome, the data table was translated into a truth table. A fuzzy set qualitative comparative analysis tool called fsQCA was used to come up with the truth table as well as to analyze the data further. Figure 18 shows the truth table that was produced after execution.

This truth table in Figure 18 comprises of \(2^n\) rows representing all possible combinations of causal conditions and \(n\) is the number of causal conditions. From the truth table it can be seen that there are 18 non-contradictory rows, eight that are uniform in displaying outcome (consistency = 1.0; rows 2, 6, 10, 13, 14, 17, 18 and 19) and 10 that are uniform in not displaying the outcome (consistency = 0.0; rows 3, 4, 5, 7, 8, 9, 11, 12, 15, 16). There are no contradictory rows. The full truth table comprise of 64 rows, 46 of which are remainders, which are casual combinations that lack cases.

The final statement after a series of simplifications as interpreted using Figure 17 says \((A \land D \land \lnot E \land F) + (A \land B \land D \land F)\), which means that, ICT infrastructure, ICT processes, organizational processes must be adequate and well reinforced through adequate governance structures, so as to ensure appropriate operational integration, ICT skills does not necessarily have to be adequate but must be present (minimal effect), while organizational infrastructure have negligible effect on operational integration. This does not necessarily mean that other components (ICT skills and Organizational infrastructure) included in the study are rendered useless; we have just looked at a sub item of the strategic alignment model and also this research uses fuzzy set qualitative comparative analysis and not crisp set analysis where a component is either there or not, implying that a component may be present but its level of effect treated as a continuous variable will be minimal or negligible. Organizational infrastructure must be adequate when we look at the whole model, though it might be seen as having minimal effect on operational integration. From mobile money perspective organizational infrastructure is not necessarily critical for involved organizations because the organization can use existing infrastructure as EcoCash is using retail and wholesale as well as banking institutions. One Wallet is using Zimpost outlets to overcome organizational infrastructure challenge.

**DISCUSSION**

From momentum gained by organisations in mobile money, no doubt the business is there. The only major challenge that still lingers in every mind goes “Is this business profitable, are the involved organisations efficient and effective” after such a huge investment in technology and other associated cost. Does the technological benefit outweigh the associated cost. Thus are there no other unnecessary technological costs that can be eliminated. All this hovering around the theme, operational integration that is are investments in ICT within this fast growing business well aligned to the key business processes and infrastructure. The issue of profitability has not yet been fully exposed since there are no published reports that can be relied upon. Performance in a mobile money ecosystem is generally
measured by client response and number of registered subscribers. 
To explore more lets first of all look at the general configuration of the costs associated with mobile money business. Leishman [54] clearly distinguishes the costs as strategic or mandatory which must be protected and discretionary or optional which can be minimised or curtailed. Before the launch, of mobile money MNOs incur a series of technology costs, including investing in an m-wallet platform, upgrading their SIM or USSD access gateway (in most cases), and deciding whether to embed their application on all new SIMs – and in most cases consequently upgrade to a larger card (while this isn’t a cash outlay at first, it’s a decision of major financial significance).

The next bunch of costs are basic operational costs from an organisational perspective these include recruitment, management, training as well as merchandising a network of dispersed agents and related organisational costs majority of which are involved. Most of the costs identified thus carry on after the service has been launched. The day a service goes live, a third set of costs comes into play: ongoing costs. These basically include cash-in/cash-out, agents’ commissions, SIM cards, starter packs and agent registration commissions for customer acquisition, and internal transfer fees for using SMS services or selling airtime at a discount [54].

From this analysis the researchers noted that organizations in the telecommunication and financial sectors dominated in the mobile money business. Telecommunication companies successfully taking the lead with financial institutions as partners. The reason why telecommunication companies dominated is that they have the appropriate technology and infrastructure. However it does not end on technology and infrastructure ownership, the technologies need to be properly aligned to ensure survival and sustainability of the product. Some mobile money products failed to survive due to operationally disintegrated components of alignment. Below this study make a comparison between mobile money in Zimbabwe and other African Countries.

Mobile Money in Zimbabwe Comparison to Other Africa Countries

Table 4 shows how Zimbabwe fared with respect to other African countries. Kenya leading the race followed by Tanzania illustrates how mobile money is penetrating African countries. Zimbabwe with a ratio of mobile money subscription to mobile subscription of 18.18 percent shows a faster penetration rate.

The higher rate of penetration is due to a higher number of the unbanked mainly rural population. Zimbabwe with an unbanked population of 70 percent is conducive for the proliferation of mobile money as noted by the popularity of mobile money products in Africa. Though the sector is dominated by mobile network operators banks have now realised that through mobile money they can access the once unbanked poor in the rural parts of Africa. This is achievable through partnering...
Table 4. Mobile Money Snapshot for some African Countries (Adopted from Jenkins [8] and POTRAZ [55]).

<table>
<thead>
<tr>
<th>Category</th>
<th>Zimbabwe</th>
<th>Burundi</th>
<th>Kenya</th>
<th>Rwanda</th>
<th>United Republic of Tanzania</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (thousands)</td>
<td>12 974</td>
<td>8 413</td>
<td>40 669</td>
<td>10 660</td>
<td>45 012</td>
<td>33 532</td>
</tr>
<tr>
<td>% of the population 20 years and above</td>
<td>61.8</td>
<td>62.3%</td>
<td>57.7%</td>
<td>57.5%</td>
<td>55.5%</td>
<td>51.7%</td>
</tr>
<tr>
<td>Mobile network operators</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Mobile subscriptions</td>
<td>11 000</td>
<td>1 076 478</td>
<td>24 960</td>
<td>3 730 000</td>
<td>21 203 698</td>
<td>16 015</td>
</tr>
<tr>
<td>Mobile subscriptions</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Mobile money platforms</td>
<td>2 000 000</td>
<td>29 000</td>
<td>17 800</td>
<td>309 127</td>
<td>9 200 000</td>
<td>2 100</td>
</tr>
<tr>
<td>Mobile money subscriptions to mobile subscriptions (per cent)</td>
<td>18.18</td>
<td>2.7</td>
<td>71.3</td>
<td>8.3</td>
<td>43.4</td>
<td>8.1</td>
</tr>
</tbody>
</table>

with mobile network operators. The success of Safaricom’s M-Pesa in Kenya after it partnered with Equity bank introducing M-Kesho serves as the best lesson. M-Kesho allows clients to transfer excess cash from their wallets into Equity Bank accounts and earn interest on them. M-Kesho also offers micro loans and insurance cover to subscribers on the M-Pesa platform. Besides Equity Bank Safaricom has also partnered with Commercial Bank of Africa, Standard Chartered Kenya and CFC Stanbic, as did Airtel Kenya and Citigroup. In Burundi Econet Wireless has partnered with National Post Office to offer its mobile platform EcoKash. In Tanzania Vodafone has also partnered National Bank of Commerce and National Microfinance Bank to offer the M-Pesa platform. Econet Wireless Zimbabwe’s EcoCash partnered a number of banks among them Commercial Bank of Zimbabwe (CBZ) and Stanbic Bank. Besides Zimpost outlets NetOne’s One Wallet also partnered First Banking Corporation (FBC).

The other dimension of interest besides partnerships is the Access Channels offered by different Mobile Money Platforms across Africa. In Kenya Safaricom’s M-PESA uses SMS/STK, Airtel Kenya’s Airtel Money uses SMS/STK, Econet Wireless’ Yu Cash uses a number of channels which are SMS, USSD/STK, USSD, Voice and WAP while Orange Kenya’s Orange Money uses SMS/STK, USSD, WAP and Java app. Some mobile platforms use USSD only and they include Tigo Cash and Airtel Money from Rwanda, Tigo Pesa and Z Pesa from Tanzania as well as M-Sente in Uganda. EcoKash in Burundi uses only SMS while other blends the channels. M-Pesa in Tanzania uses USSD/STK while MTN Mobile Money in Rwanda and Uganda, Airtel Money in Tanzania and Airtel Money uses SMS/STK. In Zimbabwe the platforms which include EcoCash and One Wallet uses USSD and SMS.

Conclusion

There is no watertight solution, but achieving operational integration is possible. A decade of research has found that the key is building the right relationships, processes, governance structures and providing the basic training. As mobile money providers have realized the importance of agents in their business models, four interlinked problems have emerged: profitability, proximity, liquidity, and trust. Though we have listed some of the key cost components, non-disclosure of financial performance data makes it very difficult to assess the profitability of mobile money transfer products that have been launched in the past three years. Conclusively, businesses should first of all evaluate the impact of technological processes and infrastructure before they can commit to new technology. Some cheaper ways of doing business may be available. The best approach is partnering, that is adopting a mixed model where MNO taking a lead in provision of mobile services, technology and infrastructure, while an organisation with branches nationwide as well as a sound liquidity position for example a financial institution provides organisational
processes and infrastructure.

REFERENCES


[35] Donovan K. Mobile Money for Financial Inclusion, Information and


