Community-Based Identification in Rural Banking

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ABSTRACT

Identity deals with answering the question of "who am I?" or who are you?". It answers the question of who or what a person or thing is and deals with the characteristics determining this. In commercial transactions, identity is very important and various mechanisms have been devised to deal with this question. The question that needs answering is whether these conventional mechanisms can work in all situations. Most businesses in the developing countries undeniably lag behind their counterparts in the developed countries in terms of technology. To catch up they often adopt information technologies and business practices that are already in use. Adoption of these technologies is however affected by the culture of the relevant communities (Liljander, Gillberg, Gummerus, & van Riel, 2006) and the structures to support implementation of the technologies. This paper looks at the protection of the digital identity and propose identity management techniques more suitable to rural Ghana. It proposes an alternative identity verification mechanism which focuses on identity as a social construct.

Keywords: Identity, culture, community, technology, developing countries.

Introduction

A person's identity in current day use involves marking the person by a set of distinguishing characteristics, which are socially consequential but more-or-less unchangeable. Organisations use various pieces of information to create and verify identity (CIFAS, 2009), which is normally done on an information system. Identity in that sense describes a data construct or a series of attributes that represents an actual entity in a particular context. This means that an identifier is simply data signifying an identity (Office of the Corporate Chief Information Officer, 2003). These include personal details such as your name, date of birth, address, mother's maiden name, etc. Each piece of information forms a partial identity of an individual and each personal identifiable information or a combination of such information can distinguish an individual to an extent (McCallister, Grance, & Scarfone, 2009). These details are in turn verified by a mosaic of documents and records, including passports, driving licences, birth or marriage certificates, utility bills, bank statements, payslips, educational qualifications.

There is some evidence that are there huge segments of the population in developing countries who have no birth certificates or other identity documents and are thus excluded from benefits and opportunities especially when they tend to be poor and/or living in rural areas (Vandenabeele & Lao, 2007). This situation is similar to rural Ghana. This paper discusses the effects of identity verification on fraud control in rural banking. It also discusses alternative identification mechanisms that could be used to deal with the current weaknesses.

Identity as a Social Construct

Identity is fundamentally a social and personal construct (Fearon, 1999). In other words, everyone identifies with a group of people and depending on the context, people define themselves through their associations and certain properties to which a person feels a special sense of attachment or ownership (Olson, 2016). This could either be their country of origin, profession etc. Social identity involves a set of persons marked by a label and distinguished by rules deciding membership and characteristic features or attributes. Though certain categories of identity in current usage are not seen as central to a person's identity, it evokes the idea that social categories are bound up with the basis of an individual›s self-respect (Fearon, 1999). Personal identity on the other hand relates to the terms personality, individuality, and individualism. In essence, personal identification concerns the practical way in which individuals are identified in various contexts. That notwithstanding, personal identification can only be done relative to other people in the society, emphasising the social nature of identity.

Identity and its Use in Transactions

A person›s identity is central to almost all commercial activity and one of the key elements in committing fraud. To distinguish an individual is to identify the individual (McCallister et al., 2009). Since commercial transactions occur between two or more individuals, identity becomes crucial to ensuring the security and the integrity of the transaction. Whether electronic-based or paper-based, the issue of identity management is a critical activity in business transactions, including banking.

Banks for example open accounts for legal entities that have the capacity to enter into a contract and can be held liable in the event of a breach. This identity is determined by a collection of personal information that commences at birth, expands throughout life, and terminates often after death (Fafinski, 2005).

Whereas it is acceptable to assume an identity in informal virtual communities, it is important to maintain identities in business to ensure that participants are able to assess the risk presented by other participants and guarantee the ability to trace them if the need arises. Failure to maintain this consistency could allow people to create identities that could increase the risk of identity fraud.

Interfacing Fraud, Operational Risk and Information Security

The Oxford English Dictionary defines fraud as criminal deception intended to gain money or personal advantage (Oxford University Press, 2017). In banking, fraud is classified as an operational risk. The Bank for International Settlement's Basel Committee(BCBS), in a document supporting the new capital accord refer to six activities that fall under operational risk. These activities are:

i. Internal Fraud
ii. External Fraud
iii. Activities relating to client products and business practices.
iv. Damage to physical assets
v. Business disruption and systems failure
vi. Execution delivery and process management (Basel Committee on Banking Supervision, 2001)

Operational risk is defined as the direct or indirect loss resulting from failed internal processes, people and systems, or from external events (Basel Committee on Banking Supervision, 2001). Consequently, the prevention of fraud is best done through the creation of robust systems and processes that ensure that data objects used within a bank are internally and externally consistent and verifiable. This implies that data within information systems must be correct by it being a true reflection of the real world and any relationship with a child, peer, and parent object. This consistency of data is generally referred to as data integrity. This is therefore the main information security requirement that is breached in the bid to create deception in the process of committing fraud.

Identity Crime and the Management of Identity

Identity fraud occurs when a fictitious or stolen identity is used to support unlawful activity, or when someone avoids obligation/liability by falsely claiming that he/she was the victim of Identity Fraud (Police Commissioners' Conference-Electronic Crime Steering Committee, 2003). A fictitious identity is created by manufacturing, forging, or fraudulently obtaining legitimate documentation to satisfy proof of identity requirements. It also includes altering ones personal identifiable information. Identity theft on the other hand occurs when the perpetrator uses the personal identifiable information of another living or dead person.

Central to the issue of fraud is identity because it confers certain rights and privileges on individuals. It is therefore crucial to the perpetration of fraud

and for that matter its prevention. The most common way hackers break into information systems from all backgrounds and motivations is by stealing and using a valid credential (Schneier, 2016).

Alternatively, some fraud instances involve the perpetrators using their real identities but pretending to be trustworthy. Identity in use today does not cover issues of character and personality. Hence, modern identity artifacts not have any mechanisms for determining a person's character. Identity however relates to character and trustworthiness nonetheless because a prime reason for distinguishing one person from the other is to establish trust.

Customer Due Diligence in Banking

To prevent identity related crime, banks fall on various identity management techniques. These involve the use of robust controls to ensure that users are who they say they are, can see only the information they are authorized to see and are set up on systems when they join a bank as a customer or employee and deleted when they leave in an efficient and prompt manner (PricewWaterhouseCoopers, 2004). Properly identifying customers when they open account in a bank is very crucial and a key part of customer due diligence in banking. Popularly known as Know-Your-Customer (KYC), customer due diligence is commonly accepted in banking as key to ensuring security of banking operations and the prevention of the use of banking facilities to engage in criminal activity and money laundering.

The Bank for international settlements indicates that KYC policies should involve a customer acceptance policy, customer identification, an on-going monitoring of high risk accounts and risk management (WGCB, 2001; Working Group on Crossborder Banking, 2001). A customer acceptance policy is essentially a policy on customer profiling involving how to identify high risk customers and deal with them. In performing customer due diligence, the customers' background, country of origin, public or high profile position, linked accounts, business activities, or other risk indicators should be considered to determine how risky the customer is (Working Group on Crossborder Banking, 2001).

The problem with conventional identity management as it is practised today is that it relies on credentials created and packaged by another organisation as a means of verifying customer identity. To do this, a bank links a name, address, and some other additional personal details to a natural person by verifying credentials bearing these information. The idea is that the crossed referenced organisation would have verified the identity of the person before issuing the identification credential.

A basic flaw with this form of identity is that it can at best tie a name and an address to a person. It cannot indicate the character of people and since correctly identified people could still pose a threat it does not go far enough.

Conceptual framework: The Clark-Wilson Security Model

From the above, it is evident that identity management has a direct impact on fraud control,. Fraud control as an operational risk should be done through the control of business processes and systems by ensuring that data items are consistent with the real world they represent and that it is verifiable. In this sense, it is important to ensure that the processes and systems that are used to create and manage identities in banks are robust to prevent fraud. The ultimate aim is to ensure that identity artefacts should be such that is can be verifiably tied to a natural person in order to form the basis for the creation of an identity in a bank.

This paper applies the Clark-Wilson security model (Clark & Wilson, 1987) which has a primary focus on business systems to analyse the rural banking system. The main goal of the model is to ensure data integrity, instead of the other security goals, like confidentiality and availability. Data integrity has been established as the main security goal in the prevention of fraud.

Integrity has been described as an element of security guarding against improper information modification or destruction. It includes ensuring information non-repudiation and authenticity (Barker, 2003).

The Clark-Wilson model identifies two important mechanisms that are at the heart of control of fraud in commercial organisations. These are a well formed transaction and separation of duty (Clark & Wilson, 1987). The first certification rule in the Clark-Wilson model states that 'the system will have an Integrity Verification Procedure (IVP) for validating the integrity of any Constrained Data Items (CDI)' (Anderson, Stajano, & Lee, 2001). A CDI is any data item with secured integrity. Personal identity information when accepted, entered and used in a bank's information system can be described as a CDI.

The fifth certification rule states that any Transformation Procedure (TP) that takes as input an Unconstrained Data Items (UDI) may perform only valid transformations, or no transformations, for all possible values of the UDI. The import of this rule is that a TP must either transforms a UDI into a CDI or reject it. In other words no personal information should be entered into a banks a system unless it is verified that is to say convert it from a UDI to a CDI.

The model also introduces the concept of the well-formed transaction which is generally an operation on a data item. Well-formed transactions must be such that a user cannot manipulate data arbitrarily, but only in constrained ways that preserve or ensure the integrity of the data.

The argument here is that an identity creation process on a banks information system must be such that it is robust enough to ensure that the information captured are accurate and that they represent the natural person.

Objective of the research

The objective of the research was to explore how identity is defined in rural banking and how the use of this identity affect perpetration of fraud by investigating how rural banks create identities on their information systems for the purpose of offering banking services. It also sought to investigate the possibility of using alternative identity model to improve identity management and reduce fraud. This was done by analysing

the nature of the rural banking industry and how it affects identity management. It was also achieved by examining the Artifacts used to create identities in rural banks and how this affects service delivery vis a vis the perpetration of fraud.

Methodology

The study was exploratory and adopted a mixed approach to enable a deeper understanding of the issues. This was because the area of rural banking security has not been researched extensively or thoroughly in the past.

The methodology used is described in Figure 1 below.

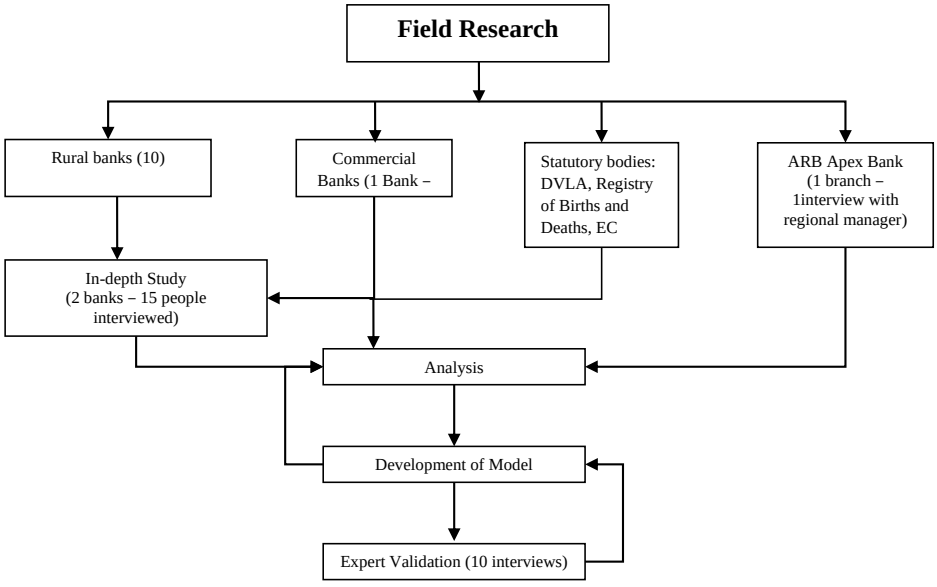

Figure 1: Research Methodology

The study combined a survey of 10 rural banks and interviews of staff from two of the banks. A questionnaire was administered to understand the general rural banking environment whilst in-depth interviews were used to have a more detailed understanding of the object of the study. Interviews were also conducted at three statutory agencies to help understand the broad rural banking environment. Interviews were also conducted with members of staff from the rural banking regulatory agency ARB Apex bank and one commercial bank to for triangulation to validate the results.

Sampling of Rural Banks

The rural banks studied were drawn from the coastal and middle belt of Ghana due to their expected homogeneity as a result of their historical and cultural similarities. This homogeneity was further confirmed from the consistency of the data collected. Table 1 shows the distribution of rural banks in the various regions studied compared to other regions.

Table 1: Distribution of Rural Banks in Ghana

Region	Total No of Rural Banks	Percentage (percent)
Southern and middle belt	104	80.6
Northern Ghana	14	10.9
Volta	11	8.5
Total	129	100

This region has a total of 104 rural banks making a total of 401 agencies. In total ten rural banks were randomly selected and surveyed. Two out of the ten rural banks were studied in more detail by observation and further interviews. One branch of the ARB Apex bank and one commercial bank were studied.

A sample of 10 rural banks was selected representing about 10 percent of the banks in those regions. The selected sample had a total of 50 agencies. Table 2 shows the sample taken and their respective regions. A random sample of 10percent was selected from each of the six administrative regions constituting the southern and middle belt region

Table 2: Sample Distribution

Region	Sample Size
Western	2
Central	2
Eastern	1
Greater Accra	2
Brong Ahafo	1
Ashanti	2
Total	10

Data Collection and Analysis

Data collection was in two phases. A structured questionnaire developed by the researcher was used to collect objective data. This initial data was fed into the collection of largely subjective non-structured data using interviews and observation. A semi-structured interview was conducted using an interview schedule. Other informal follow up interviews were also conducted to help further explain various issues that arose within the course of the field work.

Bankers are highly reluctant to inform the public about fraud and information security incidents within their organizations hence the assurance of anonymity was crucial to ensure success of the data collection process.

The data collection process involved the administration of a structured questionnaire to 10 Rural Banks and an in-depth study of 2 out the 10 Banks. The in-depth study involved a two (2) week observation of each bank and a further interviews of staff of the banks.

To validate the data collected, an interview of a regional manager of the ARB Apex Bank was conducted. Also two (2) members of staff of a commercial bank were interviewed.

Description of Rural Banks

Rural banks are commercial banks with restrictions on what services they can offer and where they can operate (Andah, 2005). This banking system was created to provide banking services to the rural Ghanaian population who, most often, do not have any other formal of formal financial intermediation. Rural banks operate as commercial banks under the Banking Law, Act 673 and its amendment Act 738, except that they cannot undertake foreign exchange operations. They therefore accept deposits and offer lending to their clientele.

Rural banks are in essence community banks in that their clientele is drawn from their local catchment areas (Andah & Steel, 2003). Rural banks are also allowed a 20-mile radius as their rural catchment area and are not permitted to operate outside this catchment area. They cannot therefore open branches in different localities outside the areas which they have been authorised to operate in. Due to the restriction placed on their area of operation, a transaction that has parties beyond their catchment area has to involve another organisation or bank to deliver the one end of the transaction.

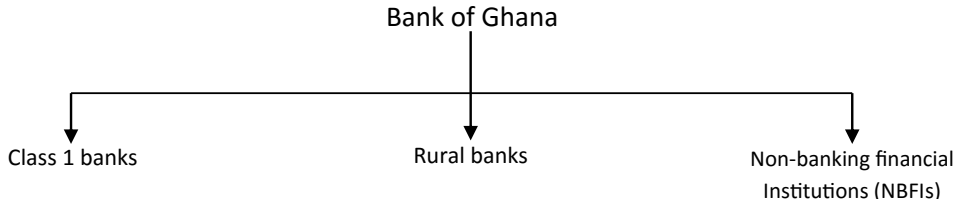

Figure 2: Structure of the Ghanaian banking industry

Rural banks are small-sized banks. The rural banks that were surveyed had an average of nine employees per branch including a security and other non-banking staff like messengers and drivers. There was a maximum of 13 and a minimum of 5 workers per branch. In total, about 14 services were offered by the rural banks surveyed.

Customer Identification in Rural Communities

Data collected on the field indicated that all the banks had similar account opening processes. This involved a process for which a personalised identity is created for the customer in the bank's system.

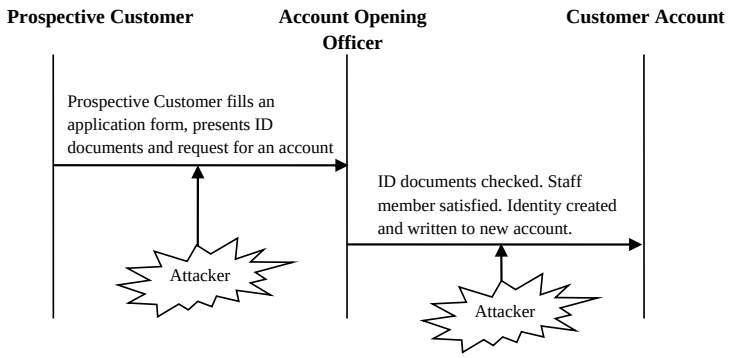

Figure 3: Customer Account Creation Procedure

There are however minor variations between the processes adopted by specific rural banks. Generally, all the rural banks demand a passport-sized photograph of the applicant; a filled application form and a sample of the customer's signature on a signature card. Information filled on the application form contain the prospective customer's name, address, occupation, employer (if employed), and salary.

Two rural banks however said that they went a bit further to demand a referee, whilst three banks demanded some form of photo identification like voter's identity card or driver's license. For corporate bodies, one bank said they demanded company certificate of incorporation. For societies, they demand the society's constitution. The various mechanisms used are shown in Figure 4 below.

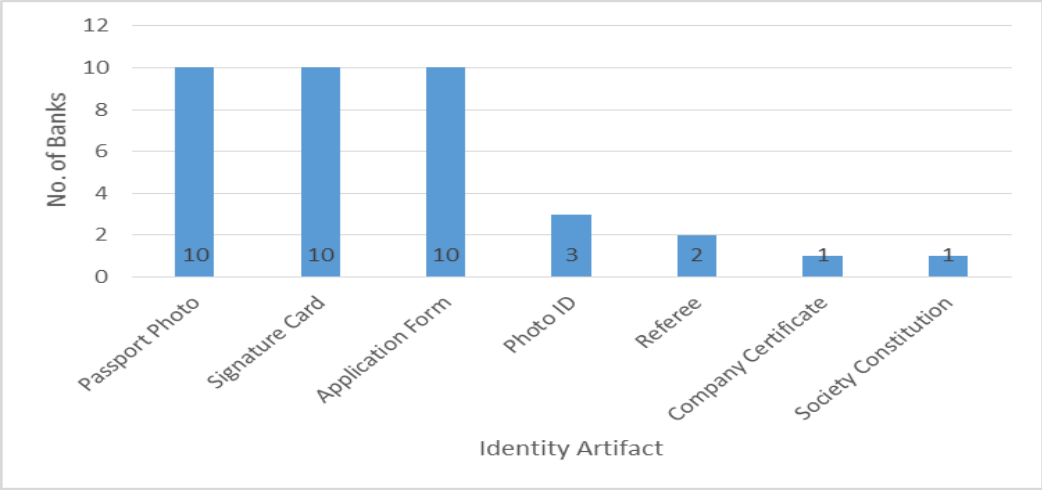

Figure 4: Identification Requirements

It was clear that rural banks attempt to verify identities of their prospective customers. However there was enough evidence to show that these mechanisms could not objectively prove the identity of the prospective customer. This was because the identity verification requirements used by these banks were inadequate to confirm that the personal identification information presented belongs to the person presenting it and that it is correct.

Identity Artifacts in Use

To achieve the requirements of the Clark-Wilson model in the creation of an identity for a customer on a banks information system, the fifth certification rule must be met. This means that the data items which are chosen to be used to form the identity for the customer and would be entered onto their information system, must be objectively true.

The interviews indicated that there were cases where people have acquired multiple identities, especially in the urban areas. Members of staff in the commercial bank that were spoken to admitted the existence of customers with more than one account which had different dates of birth for each account but belonging to the same person. Another banker indicated that in processing a loan application for a customer, it was observed that the date of birth on the customer's passport presented for the application was different from the date

of birth in their systems. Enquiries at the Vehicle Examination and Licensing Division, the statutory body that issues drivers license, a key artifact, revealed that licenses are issued without verifying the identity of the applicant. This is confirmed by several arrests and prosecution of people who had obtained more than one voters ID card in the 2008 elections (Ghana News Agency, 2008, 2012; Ghanaian Times, 2008). All these indicate the ease with which identity documents or artifacts can be obtained. The above shows that verifying a person's identity, using the current artifacts, could be said to be unreliable and incredible.

One of the main observations made was that identity artifacts obtained for identity verification could only confirm to the rural bank representative what a prospective customer has already said as there were no independent verification mechanisms. Implementation of Basel Committee-style identity checks therefore did not seem feasible. The bankers explained that two reasons accounted for this. Firstly, the underlying structures on which they are based are not present due to the nature of rural communities. Secondly, the ease of obtaining these documents did not ensure enough rigour in verifying the real identity of the people.

Problems with Underlying Structures

Basel Committee-style customer due diligence requires the validation of the provided address, birth certificates, occupation, and nationality, among other things as proof of identity. The essence of an address for instance is to be able to trace customers to that address. European banks usually require the submission of some form of correspondence from a reputable organisation like a utility company as proof of one's address (Barclays Bank Plc, 2014; Financial Conduct Authority, 2014). The rural bankers indicated that they are unable to require prospective customers to submit documents to show an address for a "hut in a small village" because they do not have recognised fixed addresses. This is because there are no named streets or house numbers, hence most people cannot tie a document to their address. Commercial bankers interviewed also indicated that even in relatively bigger towns and cities, where some streets may be named and numbered, the living arrangement of a majority of the people is such that they do not have bills bearing their names or are from the informal sector of the of the economy so do not have payslips etc.

They also indicated that in Ghana mail is generally routed through post office boxes, hence a large number of mails cannot be linked to specific landed addresses. The bank employees mentioned that many prospective customers do not have a birth certificate mainly because a good number of them were born at home by home health or maternity attendants. They actually claimed that there is no proof that some of the rural dwellers are Ghanaian citizens.

The Registry of Births and Deaths in Accra indicate that only about a third (33%) of births in Ghana are registered, hence over Sixty percent (60%) of all Ghanaians do not have birth certificates. They further explained that evidence of a birth is not necessarily required before a birth certificate is issued. The consequence of this is that multiple birth certificates could easily be obtained with different identities. The Registry also pointed out that the fact that a majority of Ghanaians could potentially not prove their identity and citizenship. Potentially, this excludes them from several benefits, including opening a bank account.

Coping Mechanisms

Some of the banks' employees indicated that they had devised various ways to verify the identity of customers. A teller in the rural bank mentioned that when third party customers bring in cheques to withdraw money from another person's account, they sometimes ask for them to verify their identity by seeking a reference from someone in the community that the bank could trust. He indicated that the customer's priest was usually used for such a purpose mainly because the priest

was trusted in the community. This is however not an official requirement in the bank. It is only used by staff members to cover themselves from being held culpable in case of a fraud.

Social Identity in Ghana

Most individuals in Ghana belong to one ethnic group or the other. They often identify themselves as such. They speak the language of their tribes and largely follow the traditions of their tribes. Tribes on the other hand, are made up of families to which individuals belong. A Ghanaian family has been described as a cohesive unit which ideally provides economic benefits in terms of land for farming, and social and psychological security to all its members (Degbey, 1997). Families own the land in Ghana and Chiefs and family heads are caretakers of the land (Ubink, 2007) on behalf of their family members. This system is an important source of family cohesion. Ghanaians trace their roots to their ancestral villages for identity. Even in death, they are often sent back there to be buried. The Ghanaian family defines social and moral norms and safeguards material, spiritual customs, and traditions. It is seen as providing a variety of role models for preparing for adulthood. This system, with the dominance of its elderly members being the custodians of societal knowledge has a relatively high degree of social control on the individual especially the youth. Families therefore form a very important community unit for identity and cohesion in rural Ghana. When two individuals meet and decide to get married, the families from both ends must come together to witness the ceremony to make it valid. Family and family members are the ones who meet to contribute resources and arrange a funeral when an individual dies. Families also serve to mediate between two members when there is a problem, arrange to take care of an ill family member, or offer support when a member gets into trouble.

It is worth noting that the concept of a nuclear family is not popular in rural Ghana. Rather, extended family is the norm. Such a society provides a context, which is very different from most western societies.

With such strong social identity, which is tied to a person's personality and individuality, identity verification could be done at that level. This is more so because identity credentials produced in Ghana are unreliable as verification tests or checks are either not made or is not possible to make.

Community-based certification

Community-based identity verification is presented in this paper as an alternative to the conventional practice of using identity credentials issued by other organisations. The idea is that since identity is a social construct, recognised associations of an individual can be used as a means of verifying identities of individuals. These include rural drumming groups, family associations, churches, etc.

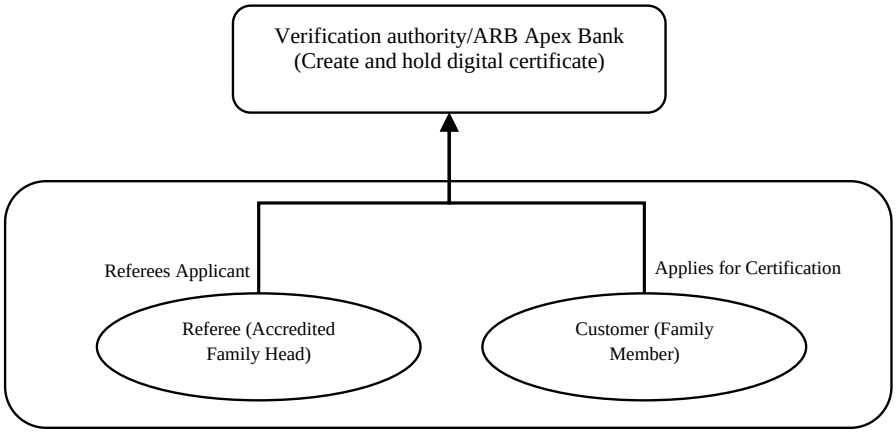

Figure 5: Actors in Community Based Identification

Rural banks operating in rural Ghana could take advantage of the unique social structure and cultural set up to verify the identity and character of a prospective customer by asking the family of the person of the family head to give a reference. The regulatory bank could have the role of accrediting customers through the community scheme and assigning them a risk value. They would under the community-based certification create a list of vetted and approved community leaders and family heads. These would represent families and be called upon to identify and verify the particulars of members of those families who have applied to open accounts with a rural banks. When the identity is verified and refereed, a digital certificate could then be issued and kept with the regulatory bank. These certificates can then be accessed by the banks involved in the scheme.

Families desire respect within their communities. It is the responsibility of family members to handle a misbehaving member who threatens, by his actions, to disgrace the family (Herndon, 2009). Families would in effect be staking their reputation on the member being refereed. In so doing, a family refereeing its members will be held liable collectively by being labelled as risky if the refereed member ends up as a fraudster. They would therefore have the incentive not to endorse a criminal to a bank as it would bring the whole family into disrepute reducing the trustworthiness within the community and with the bank. It is expected that people who have moved from their original home towns could still take advantage of the centralized certification scheme to have their family heads give them a reference.

In the cases where people cannot use their families for certification, community leaders of acceptable identifiable groups could be used as a mechanism for referencing. In marketing towns for example, there are marketing associations with identifiable leaders. These organisations could give a group reference to their members. However, that would mean that the organisations would be staking their reputation on the line when they give a reference to a person. The logic here is that the level of reputational risk to a family or a community grouping must be commensurate with the risk rating the bank would assign to the person being assessed.

Conclusion

With personal identity closely tied to social identity, alternative schemes like the one being proposed here should be developed. This would convert the current impersonal methods in use to a more socially oriented system, which can be expected to give more rewards by satisfying other qualitative and non-quantifiable elements of identity. It will also extend the availability of banking services to a wider section of the population who are currently excluded.

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