The African Journal of Information Systems

Volume 1 | Issue 2 Article 2

2-2009

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Research Paper

Volume 1, Issue 2, February 2009, ISSN 1936-0282

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ABSTRACT

This article provides an exploratory model that assesses the factors that influence formalisation of information systems (IS) for small- and medium-sized enterprises (SMEs) in sub-Saharan Africa drawing on data gathered in Botswana. The paper defines four levels of formalisation of IS for SMEs and identifies the internal and external factors that influence the process of IS formalisation. Key findings demonstrate a strong reliance on informal information practices amongst SMEs, alongside widespread unmet demand for formal information. It is also observed that successful enterprise development requires optimum use of both formal and informal IS. Evidence suggests this is achieved through developing the necessary internal capabilities and skills for information handling, including use of information and communication technology (ICT) and by forging key external market linkages – a duality of factors that constitute two key drivers for formalisation. The paper discusses the implications of the study for information systems in general and for the practice of information systems in SMEs in sub-Saharan Africa in particular.

Keywords

SMEs, information systems, ICTs, Botswana, sub-Saharan Africa

Formalisation of Information Systems in sub-Saharan African Small and Medium Enterprises: Evidence from Botswana

BACKGROUND AND AIMS

SMEs in sub-Saharan Africa suffer from many constraints related to an unfriendly policy and regulatory environment, lack of finance, skills, access to markets and market information (Liedholm, 2002; Marsden, 1995). In the past, considerable institutional and entrepreneurial effort has been expended to address these constraints and encourage enterprise growth, and some of these initiatives have been directed towards addressing information utilisation and information system (IS) capabilities of SMEs (Duncombe, 2005; Duncombe & Heeks, 2002; 1999). Experience shows that the effectiveness of intervention for SMEs depends upon building enterprises' competence to process and use externally sourced information and knowledge resources (Murphy, 2002). It can also involve selective deployment and application of information and communication technologies (ICTs) to upgrade the informatisation of SME processes and decision making. The process of upgrading SMEs' information use, systems and technologies has been characterized as a move towards *formalisation* of IS (Butler & Hansen, 1991).

The ability of SMEs to formalise their information and communication systems is important for a number of reasons. For enterprises that wish to develop and possibly grow in size, reliance on informal localised information, although still essential, may become an inhibiting factor (Fuellhart & Glasmeier, 2003). Growth-orientated enterprises may wish to access formal credit facilities. They may want to expand their market reach beyond their immediate locality or they may wish to access modern technology and training. It may be necessary to look further afield for raw materials and other business inputs and they will have to take greater account of the legal and regulatory environment within which they are operating. Conversely, those enterprises that continue to rely on informal IS may find this to be a barrier. Informal information may be constraining and insular if the entrepreneur's social and business network itself is small and knowledge poor (Barton, 1997).

Research conducted by one of the authors in the late 1990s (Duncombe & Heeks, 2002; 1999) examined the role of information, information systems and ICTs for SME development in Botswana. One of the key findings of this research was that there exists a continuum of information usage – from informal to formal – and for enterprises to grow and develop there is a transition point at which there needs to be greater formalisation of processes and organisation. Particular characteristics of the transition included: a) demand for an increased volume and complexity of information as the value of information was recognised; b) reducing information needs gaps as internal capacity to meet information needs rose; and c) a greater emphasis on external communication of information. This transition may also be accompanied by a move from manual paper-based to ICTs for internal processing of information, and from telephony to ICTs for external communication. The process of adopting ICTs should, therefore, be considered as part of the wider informal to formal transition process for information systems.

Since the late 1990s, there have been some key studies that have added to this line of enquiry from other sub-Saharan African countries. It is useful to survey these studies to bring our knowledge of the research area up-to-date.

Kyobe (2004) investigated strategic utilisation of IT resources amongst a sample of 70 SMEs in South Africa, and found considerable constraints to formalising IS observing that 'raw data is collected in many cases but cannot be converted to useful information for strategic purposes'. Lack of skills and knowledge were observed as the main inhibitors, which led to under-utilisation of information and IT resources. Amongst micro- and small-scale enterprises (MSEs) in Kenya, Moyi (2003) found 'considerable information gaps' with enterprises, across all sector and size ranges, driven toward informal information sourcing which was largely inadequate for their needs and which resulted in high search costs and poor quality information. In this case, institutional constraints and poor functioning of business networks were seen as greater barriers to formalisation of IS than use of ICT. Matambalya & Wolf (2001) surveyed SMEs in both Kenya and Tanzania and through empirical analysis of enterprise samples found no significant relationship between investment in ICT and increasing productivity, but pointed towards a certain 'threshhold' or critical mass that needed to be achieved before the full benefits of ICT could be realised. More recently, and drawing on data collected from Nigerian and Ugandan SMEs, a time-dependent model linked to formalisation of IS is put forward by Oyelaran & Lal (2006). Here, formalisation is expressed in terms of 'learning environments', where non-formal environments are observed as the dominant form of mastering new technologies, with local and overseas formal training is positively associated with increasing ICT capability and complexity.

In the Southern African region a recent study by Chiware & Dick (2008) focuses on assessing information needs and information seeking patterns of small, medium and micro enterprises (SMMEs) in Namibia – a country comparable to Botswana in terms of socio-economic status, size and population distribution. The study reveals that SMMEs largely rely on informal information sources despite the existence of a wide range of business information services in Namibia. Reasons for this include widespread lack of knowledge of formal provision, and lack of skills to use information, on the behalf of SMME owners, whilst the institutional providers of information were often badly attuned to SMME needs. Another recent survey carried out by Esselaar, et.al (2007) assesses ICT usage across 13 African countries, distinguishing between enterprises according to a formality index – between informal, semi-formal and formal sector enterprises. The study focuses on technologies rather than information systems, identifying ICTs as productive input factors with their use correlated positively to labour productivity for informal as well as formal sector enterprises – pointing towards the widespread and increasing use of mobile phones as being significant in this respect.

More recent studies concerning information, ICTs and SMEs have also been carried out in Botswana which provides further evidence to illustrate how the sector has developed since the late 1990s. Most recently, Mutula & Brakel (2007) draw upon qualitative evidence from a sample of 114 enterprises, reporting that SMEs in Botswana have still not achieved a reasonable measure of e-readiness and that lack of formalisation of IS is still a key constraint. Also in this vein, Jorosi (2006) concludes that information (particularly customer information) is still a key concern and constraint for SME managers; whilst Temtime et.al (2003) positively associate use of ICT with characteristics of formalisation such as better business planning for Botswana SMEs.

Finally, Sathyamoorthi (2004) in a study of 50 business enterprises in Botswana found that lack of knowledge about the existence of (formal) financial and training institutions has contributed to poor performance.

All these studies provide interesting results and point towards a number of common factors and concerns that relate to formalisation of IS and use of ICTs in sub-Saharan Africa SMEs. Whilst all the studies provide new data, there is noticeable lack of conceptualisation of the research area. Research acknowledges the role of both formal and informal IS, but there are no studies that seek to systematically analyse the way in which they interact, and less understanding of the discriminating variables that differentiate those SMEs that have formalised their IS and those that have not. This exploratory study intends to fill this gap in knowledge by re-analysing and re-interpreting the data used by Duncombe & Heeks and investigate the complexity and extent of formalisation of IS for SMEs in Botswana, thus providing the basis upon which further research can be built. The key research questions addressed are:

- How can the process of formalisation of IS be defined for SMEs?
- What are the internal and external factors that influence the process of IS formalisation for SMEs?

The paper is organised as follows. The following section surveys the literature concerning IS formalisation and SMEs and provides a framework for analysis. Next the methodology used for data collection is outlined, and the findings are presented and analysed. The paper concludes by providing some tentative answers concerning what distinguishes formal and informal IS in terms of their relative importance for different categories of enterprise, and outlines some recommendations concerning how enterprises could be assisted to improve. Finally, the paper outlines implications and directions for future research.

FORMALISATION OF INFORMATION SYSTEMS IN SMEs

In the IS literature, there is a general consensus that organisations pass through various phases in their utilisation and management of IS and related resources (Galliers et al, 2003). Some studies indicate that SMEs follow a path similar to large firms (Levy & Powell, 2003; Poon & Swatman 1999). However, these studies tend to focus on more advanced SMEs in developed countries. SMEs in sub-Saharan Africa operate in different policy, regulatory, industry and organisational contexts that make the applicability of models designed for developed countries challenging. Hence, there is a need for conceptualisation of formalisation of IS that considers the idiosyncratic situation of SMEs in a developing country context.

Understanding Formalisation For SMEs

Formalisation of IS implies that as enterprises develop, their reliance on informal information and unstructured processes is diminished, whilst the importance of formal information and structured processes is enhanced – resulting in more efficient internal use of information and knowledge resources and more beneficial interaction with external information networks (Curtis

& Cobham, 2005; Butler & Hansen, 1991). It may also imply greater use of ICTs both for internal processing and external communication of information.

Thus defined, IS formalisation can have three interrelated constructs. The first construct considers the diverse *sources* of information that enterprises access in order to meet their information needs. The second construct focuses on the degree of formalisation of the *conversion process* which includes means of communication (both for access and dissemination of information) and the means of internal storage and processing of information. The third construct looks at the sophistication of *information and communication technology* utilisation in the conversion process. We can develop this systemic model of enterprise IS (Figure 1) by considering each of the constructs in more detail.

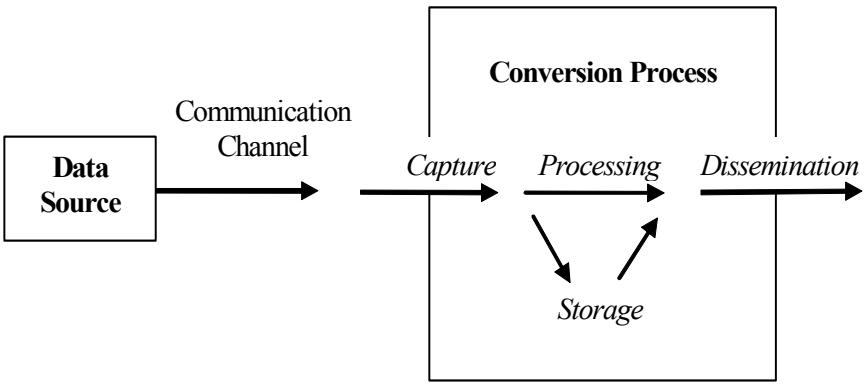

Figure 1. A Systemic Model of Enterprise IS

The approach recognises that information is a fundamental resource upon which information systems and information technologies act. It is possible to identify two categories of information – f*ormal and informal.* Formal information is that which is recorded and available in a readable form (Curtis & Cobham, 2005). It might include technical information from manuals, market information from a market report or needs survey, official government information or on-line information from a database. In sub-Saharan Africa, this type of information is often provided via institutional channels, for which there is mixed evidence of success in meeting the needs of SMEs (Temtime et al, 2003; Levitsky, 1996; Marsden, 1995). On the other hand, informal information is that where the entrepreneur relies on a network of personal contacts in the local area from which subjective information of variable quality is derived (Oakey & White, 1993). This may be information that is received from business contacts or friends and family members. Informal information will probably be unstructured, unrecorded and may take the form of rumour or hearsay. Studies show that informal (predominantly oral) information sources are favoured by enterprises in sub-Saharan Africa: they are in closest proximity, they are trusted by the recipient, they are applicable to their existing knowledge base, and they are more likely to inspire confidence and security (Van Bussell, 1998; Gibb, 1992).

We also recognise that in order to function, an enterprise information system requires not only information (Ismail & King, 2007; Hicks et al, 2006). In order to make information useful we also need to add two further components: processes of purposeful activity and people to undertake those processes. While computer-based IS have become ubiquitous in some parts of sub-Saharan Africa, other organic and paper based technologies are still widespread and will continue to be used. The conversion process, therefore, ranges from informal human-based to paper-based and to computerised and structured systems, categorised as follows.

- *Human based conversion systems:* the human body can be considered as an information-processing system. We accept signals from the environment that surrounds us, interpret and process the impulse and use that to make various decisions. Decision makers continuously observe their internal organisational and external contextual environment and use such information to help make their decisions. Such direct ways of collecting and using information is often an effective and preferred means for SMEs.
- *Paper-based conversion systems:* paper continues to be one of the most commonly used technologies for storing and transmitting information in sub-Saharan Africa. Paper-based systems are often cheap to implement and easy to understand. Although past predictions have been optimistic about the virtues of the paperless office, paper based IS will continue to have their prominence in SMEs.
- *ICT-based conversion systems:* ICTs provide an electronic means to facilitate the access and conversion process of information. In addition their utilisation often reinforces formal structures. However, in sub-Saharan Africa, new ICTs (computer-based technologies and digital communications) are not the only technologies used to handle information. We also need to consider other non-digital technologies (e.g., radio and TV).

In summary, formalisation of enterprise IS spans information sources, communication, the structure of the conversion process, as well as the potential utilisation of ICTs. Formalisation should however be understood not only in terms of 'systemic' aspects but also 'quality' aspects associated with the information resource (Kiddungu, 2002; Ramachandran & Shah, 1999). Better quality information is likely to be more valuable and lead to better decision making. The literature gives little indication of how formal and informal information can be distinguished in terms of relative quality and its importance for decision making processes for SMEs. Heeks & Bhatnagar (1999) define information quality according to whether it is complete, accurate, relevant, timely and appropriately presented – attributes that make information accessible, intelligible and useful to the recipient. The extent to which formal or informal IS can conform to these criteria may be a useful measure of the qualitative aspects of formalisation, and an indication of the relative importance of informal and formal information for enterprise decision making.

INFLUENCING FACTORS FOR FORMALISATION

It is recognised that the enterprise information system does not exist in a vacuum. It requires the development of internal resources as well as access to external networks. It sits within an environment of institutions (e.g., markets, kinship and family-ties, organisations, etc) and other

environmental factors and trends, all of which can positively influence or constrain IS formalisation. This section discusses the internal and external influencing factors that may impact upon the degree of formalisation.

An internal focus gives prominence to the entrepreneurial factors that govern use of information and subsequent decision-making, as well as the skills, competencies and internal resource constraints that SMEs face (Kyobe, 2004; Thong, 2001; Frese, 2000). The resource-based view of the enterprise is useful in this respect (Wernerfelt, 1984). It contends that all enterprises are fundamentally different in their nature and composition, whilst success in the market depends upon having a unique set of capabilities, competencies and resource endowments, which are both rare and difficult to imitate (Caldeira & Ward, 2003; Lundvall & Johnson, 1994; Arrow, 1962).

Enterprise IS require tangible resources in order to operate comprising a physical infrastructure and the necessary access tools (which in a sub-Saharan Africa context may or not include ICTs), as well as inputs of other facilitating resources such as finance and skills. Other intangible resources should be considered as equally important. They include trust of the information source and the necessary motivation to interact with and use the information system (Fafchamps, 1999; Barr, 1998). Pre-existing knowledge is a further resource requirement for successfully assimilating new information, drawing upon a relevant existing knowledge base (Wilson & Heeks, 2000) and so too is having a sufficient level of empowerment to actively participate in using an information system.

Evidence also suggests that enterprise characteristics related to size and growth are likely to be positively associated with formalisation (Ismail & King, 2007). Enterprise growth models, such as put forward by Atkinson & Meager (1994) identify a formalisation threshold – the point where enterprise processes move away from being ad-hoc to employing greater formal procedures. Recruitment, for example may cease to be carried out via word-of-mouth and instead utilise formal advertising, interviewing and selection techniques (Nguyen & Bryant, 2004).

In terms of external influences the literature places greater focus on the role of external networks (both formal and informal) and the networking behaviour of entrepreneurs (Levy, Loebbecke & Powell, 2003; Sengenberger & Pyke, 1992; Blackburn, Curran & Jarvis, 1991). The external networks that influence IS development can be categorised as: a) personal and social networks; b) business networks; and c) institutional networks. Whilst it is useful for analytical purposes to distinguish between the characteristics of different networks, in reality there is likely to be a high degree of merging and cross-over (Sawyerr, McGee & Peterson, 2003; Greve & Salaff, 2003). This is particularly so in sub-Saharan Africa where strong ties founded on personal and social networks tend to underlie key market relationships (Van Bussel, 1998; Humphrey & Schmitz, 1995).

Other studies conducted in sub-Saharan Africa have identified personal and social networks as particularly important for the delivery of a range enterprise resource inputs. These include not only tangible inputs such as finance and technology, but also intangibles such as trust and motivation, as well as information and new knowledge resources (Murphy, 2002; McCormick, 1999; Barr, 1998; McCormick and Pedersen, 1996). However, it is also suggested that such

networks are often providers of informal information that is of poor quality and the potential for personal and social networks to operate effectively as information providers (and their ability to have a strong formalising effect) is relatively weak (Kiddungu; 2002; Ramachandran & Shah, 1999).

There is evidence that the degree of IS formalisation will be governed to a greater extent by market pressures (Ismail & King, 2007; Salles, 2006). Studies have shown that forward or backward linkages to the market can have a strong formalising effect – stimulating business owner/managers to upgrade their IS in response to the requirements of key customers or suppliers (Murphy, 2002; Butler & Hansen, 1991). This external innovative pressure may also be experienced from outside agencies that place greater demands on enterprises to upgrade their IS in order to comply with formal institutional and regulatory requirements.

FRAMEWORK FOR ANALYSIS

On the basis of the review of literature in the previous sections, IS formalisation can be conceptualised in terms of the 'systemic' aspects associated with information access and sources, conversion processes and ICT utilisation. Each of these three constructs can be associated with differing degrees of formalisation – which in turn will impact upon the 'quality' aspects associated with the information resource. The framework spans both the internal and external enterprise domain and both sets of factors need to be considered in unison. The factors outlined in the framework also recognise differing levels of analysis – the individual level (the entrepreneur or manager/employee), the organisational level (the enterprise) or the industry level (the sector and associated business/institutional networks). Figure 2 indicates the research framework developed to guide the enquiry.

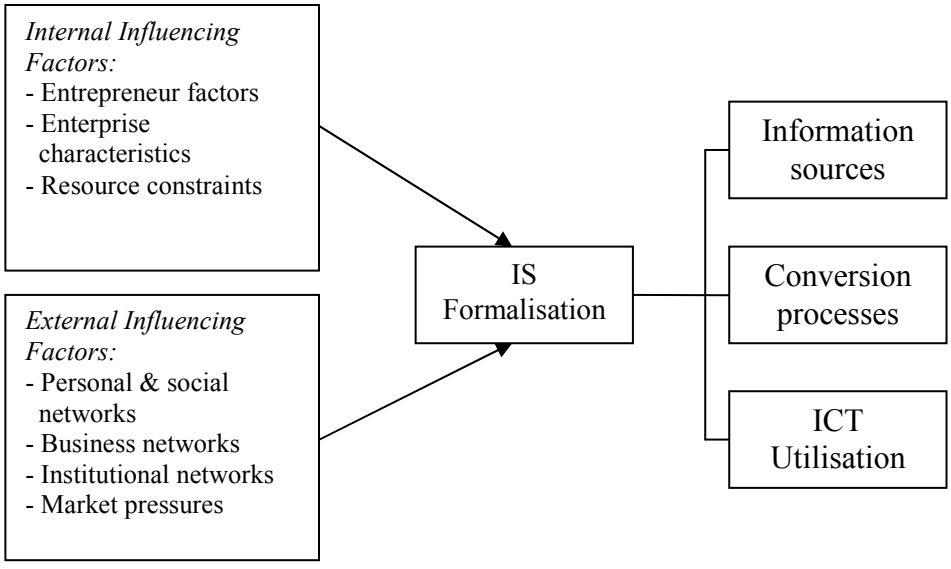

Figure 2. Framework for Analysis

THE BOTSWANA PROJECT

Botswana has succeeded developmentally at least partly due to the creation of a favourable enabling environment for enterprise growth within the formal sector. At the time of the research, formal sector enterprises were almost exclusively urban-based, and the range and volume of business activity conducted by formal sector SMEs was large, although the number of enterprises was relatively small.[i] Rapid economic growth together with considerably improved infrastructure provided enhanced opportunities for use of new IS and ICTs by SMEs in Botswana. However, a wide-range of resource, market, enterprise and entrepreneur-related constraints inhibited SME development – most noticeably amongst citizen-run enterprises (Lisenda, 1997; Jefferis, 1996). This made Botswana a salient choice to study the formalisation of IS.

RESEARCH METHODOLOGY

The research study used a multi-method approach comprising quantitative and qualitative techniques. Mixed methods provide a more comprehensive evidence base for studying a research problem and help to answer questions that cannot be answered by either quantitative or qualitative research alone. It provides researchers with better opportunities to address the research questions and evaluate the extent to which the findings can be trusted and validated (Teddlie & Tashakkori, 2003). Accordingly, both qualitative and quantitative sources of data were elicited that could provide contrasting perspectives on the research questions posed and provide a means of triangulation of data (Yin, 2003; Gable, 1994).

Data collection was conducted on two phases. The 1st phase of data collection provided a broad survey of generalised results, whilst the 2nd phase provided more in-depth qualitative data based on semi-structured interviews and extended observations of a smaller number of case studies.[ii] In addition to providing a cross-checking mechanism, multiple methods also facilitated more depth of interpretation of results and hence facilitated a higher degree of conceptualisation. In this respect, the data illustrates an episode in the formalisation of IS for the SMEs surveyed and provides evidence of SMEs at different stages of transition in their formalisation of IS. The following section considers the conduct of the research in more detail.

Survey Design (Phase 1)

The survey instrument was designed based on review of previous literature and using the key constructs of the research framework. A pilot study was conducted prior to the the main study.[iii] Results from the pilot survey were used for three main purposes: a) to test and refine the survey instrument; b) to assess the reliability of the sample; c) to refine the procedure for administering the questionnaire. The pilot survey highlighted a number of constraints concerning the reliability of the sample. Enterprises were not always correctly located in relevant sub-sector categories, and more often than not the activities conducted by enterprises tended to span two or more sub-sectors. There was also a high degree of variation in terms of response rates between sub-sectors, and overall the results indicated that an analysis disaggregated on the basis of 8 sub-sector groupings would be too fragmented to produce meaningful results. It was decided therefore to construct a simpler 2-dimensional sample divided according to whether establishments were classified as predominantly manufacturing or service-based SMEs (Table 2).[iv] The main data categories for the survey instrument are summarised in Table 1 below and

are listed in accordance with the key research constructs and factors highlighted in the analytical framework (Fig 2).

Framework Construct	**Data Category** (Question No.)
Degree of IS formalisation	
-Access and sources	Urgency of information needs (Q15) Ability to access information (Q14) Frequency of use of information sources (Q16) Importance of information sources (Q24)
-Conversion processes	Storage and processing of information (Q20) Effectiveness (Q18) and frequency of use (Q19) of methods of communication
-ICT utilisation	Frequency of use of computer-based activities (Q21) Number of computers in the enterprise (Q22) Use of Internal networking (Q23)
Internal influencing factors	
-Entrepreneur factors	Gender (Q1); Age (Q2); Nationality (Q3); Educational achievement (Q4)
-Enterprise factors	Number of employees (Q5); Annual turnover (Q6); Growth in number of employees (Q5); export share in turnover (Q11)
-Resource/business constraints	Critical success factors identified (Q25) Identified constraints (Q26)
External influencing factors	
-Networks (social, business, institutional)	Importance and frequency of use of external information sources (Q16; 24)
-Market pressures	Importance of groups of customers (Q13)

Note: A copy of the survey questionnaire can be viewed and downloaded directly from: http://www.sed.manchester.ac.uk/idpm/research/is/ictsme/ictsmeaf.htm

Table 1. Framework Constructs and Data Categories

A number of question formats were tested in the pilot survey using both open and closed questions. In the main survey questionnaire, however, it was decided to formulate closed questions that required tick box answers using *Likert Scales*. This provided a structured framework within which the strength of opinion or preferences of respondents could be gauged, as well facilitating coding and quantification. The final questionnaire was administered using a postal survey (an initial round and a follow-up for non-respondents). Correctly completed questionnaires were received from 90 enterprises eliciting a 19% response rate [v] producing a detailed set of responses that were divided according to manufacturing (46 enterprises) and services (44 enterprises).

	BSIC Codes	***Sub-sector Groupings***
Manufacturing-based	1700, 1800, 1910 3610, 2000 2610, 2620 2200	Textiles, Clothing, Leather Products Wood Products, Furniture and Crafts Building and Construction Materials Printing and Publishing
Service-based	5510, 6304 7200, 6420 6023, 6305 7422	Tourism IT and Computing Transport Engineering and Technical Services

Table 2. Sub-sector Classification for Sample Population (CSO, 1998)

The extent to which the survey was representative was gauged by comparing the profile of enterprises that responded to the survey with prior formal sector studies carried out in Botswana (Briscoe, 1995; BOCCIM, 1994). The comparison found that the proportion of citizen and non-citizen owned enterprises, the age range and the ratio of male and female business owner/managers were in line with the results of these previous studies. However, there were also areas of variation. The proportion of senior secondary school completers in the sample response is 77%, which compares with 66% reported by Briscoe (1995) for the urban formal sector in Botswana.[vi] This indicated a response bias in favour of educated business owner/managers (which might be expected from a postal questionnaire). The number of enterprises indicating growth in their labour force was also high, which may indicate that the sample response is made up predominantly of enterprises that were achieving a measure of success (in terms of an expanding labour force over the previous 2 years) , and whose owners may have been more inclined to complete the questionnaire.[vii]

Qualitative Data Collection Design (Phase 2)

Qualitative data was provided via illustrative examples of IS formalisation within individual enterprise case studies based on direct observation – a proven method for extracting qualitative data in the small business sector (Perren & Ram, 2004; Yin, 2003; Curran & Blackburn, 2001). Eight case studies were carried out in all. The observations themselves varied in length, but involved a minimum of a single day spent within the enterprise, observing processes conducted by the business owner and employees – illustrating 'critical incidents' of information handling and enterprise-level decision-making (Chell & Adam, 1994). Immediately following each observation an interview was carried out with the business owner/manager with the purpose of discussing the observational period in general and to follow up or clarify any events, actions or decisions that took place. In this manner data was cross checked and validated between the individual survey responses, the total sample response and the results of observations and interviews across all 8 case studies. Four of the case studies are used to provide illustrative examples in the following analysis.

FINDINGS AND ANALYSIS

The analytical framework suggests that enterprises may exhibit differing degrees of formalisation across a number of different dimensions relating to information access and sources, conversion processes and utilisation of ICTs. The survey questionnaire elicited data concerning all three dimensions, but for the purposes of analysis we first produced four distinct archetypes of enterprises on the basis of their ICT utilisation. This provided the most straight forward means of classification and provided a yardstick against which the other two dimensions of formalisation could be analysed and discussed. In addition, the application of ICT to support enterprise IS enforces structure on both sources and conversion processes and can serve as a higher order construct to investigate the other two. Thus, enterprises were categorised according to the extent they had progressed up an ICT adoption ladder comprising four stages: a) non-users; b) non-networked users; c) networked users; and d) intensive users (in line with an approach used by Southern & Tilley, 2000). These are termed 'ICT archetypes' and are defined in Table 3.

ICT Archetype	*Definition*	*Case Study Example*
Archetype 1: Non-IT Users (n=18)	Enterprises make no use of computers, but have access (direct or indirect) to telecommunication services, primarily telephone (fixed line and/or mobile) and fax.	Mbami Metalworks: manufacturer of fabricated steel items.
Archetype 2: Non-networked ICT Users (n=25)	Enterprises have one or more computers on their premises, but with no internal or external network connections.	Francis Wooden Furniture: manufacturer of wooden furniture.
Archetype 3: Networked ICT Users (n=21)	Enterprises with one or more stand-alone computers (i.e., no internal networking) but with an external email/Internet connection.	Active Networks: supplier of computer services.
Archetype 4: Intensive ICT Users (n=26)	Enterprises that utilise two or more computers that are networked. They have email/Internet connectivity and are also connected to an internal network.	Botswana Printworks: provider offset lithographic printing services.

Table 3. Level of Formalisation According to ICT Archetypes

WHAT IS THE DEGREE OF FORMALISATION OF IS THAT IS EXHIBITED BY SMES IN BOTSWANA?

The following analysis groups the sample response (n=90) into the four archetypes specified in Table 3. Two methods of analysis of questionnaire data are employed. First, coefficients based on non-parametric tests (spearman's rho and K-S-2 sample) are used to indicate both the direction and degree of correlation between the responses to the questions according to Likert scales and the four levels of formalisation according to the archetype model.[viii] Second, the analysis also provides simple percentage calculations in order to produce rankings (e.g., of importance, effectiveness, frequency or level of use, etc) for the factors surveyed for the total sample.

Information Access and Sources

In the first instance respondents were asked to indicate the urgency of their information needs and their ability to access information across a range of categories. Table 4 highlights the percentage of respondents who identified their information needs as essential. Information relating to locating new local customers and sources of finance were the two most essential areas for 42% of the sample. Information concerning sources of finance, existing customers and land & premises became less urgent for enterprises that were more formalised, but there was no indication of any significant lessening of information needs across the remaining categories.

	Information Needs (a)		*Ease of Access (b)*	
Information categories ranked according to urgency of needs	% stating urgency of information needs as 'essential' (n=90)	correlation with enterprise archetype *(spearman's rho)*	% stating information was 'easily obtained' (n=90)	correlation with enterprise archetype (*spearman's rho)*
New local customers	42%	-.157	21%	-.090
Sources of finance	42%	-.382**	28%	.157
Land/premises	40%	-.232*	14%	.013
Existing customers	39%	-.211*	51%	-.021
Management/staff training	34%	-.132	31%	.320**
New technology	33%	-.052	32%	.377**
Laws & regulations	29%	.014	49%	.095
Export customers	26%	-.016	3%	.160
New staff	23%	.195	30%	.068

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
(a) 4-point response scale from 'essential' to 'not very important'.
(b) 4-point response scale from 'easy to obtain' to 'not able to obtain'.

Table 4. Information Needs and Ease of Access

Respondents found it most easy to access information relating to existing customers. In all other categories more than 50% of respondents found information 'not easy to obtain' or were 'not able to obtain' the information they required. This 'information needs gap' (which can be understood as the difference between the information respondents needed and their ability to access it) was particularly pronounced on the market-side in relation to new customers, and particularly exports markets – where only 3% of respondents stated that they found information easy to obtain. Only in the areas of new technology and training was there a significant greater ability to access information for enterprises that were more formalised. In other areas, such as export markets, more formalised enterprises seemed equally constrained. This suggests that either lack of availability or external barriers to the supply of information, rather than lack of internal capacity to seek out and acquire information, may be the key constraining factor.

Respondents were also asked to distinguish between information sources that can be broadly classified as informal (i) and formal (f). The respondents were asked to indicate the frequency of use and the importance of the source. Overall, in terms of both frequency of use and importance, informal information sources were rated most highly (see Table 5).

	Frequency of use (a)		*Importance (b)*	
Information sources ranked according to importance	% who used source 'very often' (n=90)	correlation with enterprise archetype *(spearman's rho)*	% who considered source as 'very important' (n=90)	correlation with enterprise archetype *(spearman's rho)*
Own knowledge (i)	82%	-.113	83%	.170
Local customers (i)	39%	.073	47%	.008
Family & friends (i)	21%	-.097	31%	-.068
Contacts abroad (i)	24%	.428**	31%	.297**
Local suppliers (i)	34%	.196	26%	-.005
Banks/consultants (f)	22%	.221*	24%	.005
Business support agencies (f)	9%	-.046	22%	-.174
Internet (f)	16%	.729**	18%	.615**
Competitors (i)	12%	.225*	16%	.128

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
(a) 4-point response scale from 'very often' to 'not at all'.
(b) 4-point response scale from 'very important' to 'not important'.

Table 5. Sources of Information

Informal sources included both internalised knowledge and external contacts (family and friends, local business contacts and contacts overseas). Formal sources included institutions (business support agencies, consultants/banks) and use of the Internet. Most noticeably, there was no sign of a diminution in the use and importance of informal sources as enterprises became more formalised. For all enterprise archetypes, the use of internalised knowledge and business contacts was of far greater importance than formal sources. Unsurprisingly, the use of the Internet (accessed predominantly via local Internet Service Providers) increased in line with formalisation, but further analysis revealed that only 42% of Archetype 4 enterprises (n=26) considered the Internet as very important. The greater emphasis given to contacts abroad is significant, however, with more formalised enterprises placing far greater importance on information sources outside Botswana. Observations conducted of an owner/manager from a networked ICT user (Archetype 3) provided some indication of why informal sources were preferred (Box 1).

Active Networks was located in the capital city – Gaborone – with 4 employees and provided computer services – including network cabling and installation, systems integration, PC services and support. The enterprise relied on small contracts from large firms or contracts from other small enterprises. The business was built up initially through cold calling, and latterly by referrals. Close contact with customers provided a rich source of good quality information. A large network of business contacts gave rise to a constant stream of market-related information and new business opportunities. Personal contact was also important for the purpose of collecting monies owed. Exchange of important documents like invoices and payment was done by hand. This was due in part to lack of trust in postal and electronic services, but also in order to speed up and ensure payments. Non critical information was regularly communicated via email or by use of modem/fax software. The business owner spent most of his day visiting customers, suppliers and competitors. He felt this was the single most important factor in acquiring good quality information that led to new contracts or offers of work.

Box 1. Case Study Extract – Active Networks.

These observations were true in varying degrees for all the case studies, where respondents emphasised the importance of informal leads and referrals for market access. Building up a business reputation based on 'word of mouth' was identified as essential. Locating new customers was not normally dependent on receiving single leads, but usually entailed a long process of assembling a wide range of information, and following up leads in order to cultivate good customer relationships. The content of informal information concerning market access was observed to be more appropriately presented and was often more timely. Additionally, it cost less to access and apply and was provided within the social and personal context needed to supply details about trust. It also tended to be more flexible than formal information and easier to interrogate for greater or more customised details.

However, informal sources of information were also associated with poor decision making in many cases. This can be illustrated through examination of a critical incident observed in a case study of a non-IT user (Archetype 1) (Box 2).

Mbami Metalworks – located in Gaborone – employed 28 workers and was established in 1989 in response to the opportunities created under the Local Procurement Programme (LPP), which set a side a proportion (30%) of school furniture procurement for local manufacturers. Typically, over 50% of costs for products (chairs, tables, lockers, shelves, etc) were accounted for through material inputs. The business owner, for many years, had a strong relationship with one local supplier - Mack Steel. The owner of this business was a personal friend. Steel for government orders (80% of his business turnover) was purchased from Mack Steel and paid for directly by the Government Purchasing Dept. Mbami also purchased from Mack Steel for non-government work. However, a new company secretary decided to check prices from other suppliers and found them to be 40% cheaper for most common sizes they regularly utilised. This was an example where the business owner had relied on informal information and close personal ties - but to the detriment of his business (the fact that government was paying for 80% of his steel supplies was also a disincentive to check prices in a more systematic manner). This experience, along with others, had made the business owner realise the need for a more formalised approach to handing information for decision making. They switched to the new supplier - Trade World (South Africa) a company that imported directly.

Box 2. Case Study Extract – Mbami Metalworks

Such examples indicated that the quality of informally sourced information could be particularly poor in terms of accuracy and completeness. Other cases suggested that informal information was also more vulnerable to loss and misinterpretation, and harder to pass on to others than formal information. Additionally, unlike formal information, it tended to restrict enterprises to doing business and gaining knowledge within their direct-contact network, which in Botswana tends to be restricted due to the small size of the market. Keen competition was also a common feature within sub-sectors, with few observed examples of collaboration through information sharing. This is reflected in the survey results where competitors were rated lowest in importance as sources of information (Table 5).

Conversion Processes

Two aspects of the conversion process were analysed relating to external methods of communication, and the internal storage and processing of information.

Respondents were asked to indicate which methods of communication they used most often and which methods they found most effective for promoting their products and/or services. The results are summarised in Table 6.

	Frequency of use (a)		*Effectiveness (b)*	
Methods of communication ranked according to frequency of use	% who used communication channel 'very often' (n=90)	correlation with enterprise archetype *(spearman's rho)*	% who considered communication channel as 'very effective' for promoting products/services (n=90)	correlation with enterprise archetype *(spearman's rho)*
Telephone (fixed)	73%	.175	22%	-.095
Face-to-face	68%	.065	84%	-.041
Fax	68%	.331**	-	-
Telephone (mobile)	28%	.326**	-	-
Email	27%	.828**	10%	.359**
Mail/letter	22%	.335**	4%	.127
TV/Radio	-	-	9%	.001
Bill boards	-	-	10%	.200

** Correlation is significant at the 0.01 level (2-tailed)
(a) 4-point response scale from 'very often' to 'not at all'.
(b) 4-point response scale from 'very effective' to 'not used'.

Table 6. Communication Channels

Formalisation brought greater use of all forms of communication particularly use of written communication (via letter post), telecommunications and e-mail. However, formalisation did not at all diminish the use of face-to-face contact, and it remained by far the highest rated form of communication with over 80% of respondents across all enterprise archetypes regarding face-to-

face meetings as the most effective means for disseminating information about products and/or services. Although other technologies showed considerable growth in use, their effectiveness in the eyes of the respondents remains far lower. For example, formalised enterprises found email increasingly effective. However, amongst Archetype 4 (n=26) email was used 'very often' by 54% of the respondents – whereas only 19% stated it was a 'very effective' channel of communication for the promotion of products/services. The results seem to emphasise the primacy of informal 'face-to-face' communications and growth in use of technologies that tend to support informal IS, such as (mobile) telephony.

Respondents were asked where they store items of business information – mainly in their heads, mainly on paper/cards or mainly on computer. This was considered as a valid proxy for the way in which information was processed. The results summarised in Table 7 show that an increasing level of ownership of ICT resources is positively associated with increasing levels of usage across all the business processes specified, with a commensurate diminution in the use of paper-based systems. The accounting function represents the most popular area of application. For example, off-the-shelf accounting packages (such as *quickbooks*) were a common entry level for enterprises. Such packages enabled preparation of formal documentation and were used to integrate additional information from other functional areas. This is possibly reflected in the data, which shows a fairly uniform increase across most process areas surveyed, and the Archetype 4 case studies confirmed this to be the case.

In this respect, the extent to which computer-based systems are being applied for automating business processes may be the most critical indicator of formalisation, as it is through process applications that important efficiency gains are likely to be achieved. Of concern, therefore, are the significant proportion of enterprises categorised as more formalised in terms of ownership of ICT which are not yet implementing internal process improvements with the assistance of computer-based systems. These are to be found particularly amongst Archetype 2 and 3 enterprises.

Enterprise processes	*% that use mainly computer-based IS to store information concerning…(n=90)*	*Correlation with enterprise archetype (Spearman's rho)*
Company accounts	52%	.577**
Sales & invoicing	46%	.614**
Customer records	38%	.470**
Inventories/stock control	36%	.415**
Staff records/wages	34%	.575**
Supplier records	32%	.473**
Marketing & distribution records	29%	.278**
Production records	26%	.505**
After sales service records	20%	.163

** Correlation is significant at the 0.01 level (2-tailed)
(a) 4-point response scale from 'very often' to 'not at all'.

Table 7. Enterprise Processes

What are the Factors that Appear to Contribute to Formalisation of IS for SMEs in Botswana?

Here, analysis of data made use of non-parametric tests to highlight a number of internal and external discriminating factors that differentiated enterprise archetypes and which were significant (Table 8).

Factor	*Indicator*	*Significance test according to enterprise archetype*	
Entrepreneur factors		Spearman's rho	K-S (2-sample)
Gender of the respondent	Male or female	-	1.084
Age of respondent	Age (a)	-.115	
Nationality of respondent	Citizen or non-citizen	-	1.792
Education	Highest level achieved (b)	.439**	-
Enterprise factors			
Enterprise size (1)	No of employees – full time equivalent (c)	.324**	-
Enterprise growth – change in number of employees over previous 2 years	Expanded or contracted/no change	-	1.893
Enterprise size (2)	Turnover (T/O) (1997/98) (d)	.523**	-
Other business factors			
Sector	Manufacturing or service-based	-	2.858
Share of exports	% of T/O for 1997/98 (e)	.341**	-

** Correlation is significant at the 0.01 level (2-tailed)
(a) specified in 5 bands: <21;21-30;31-40;41-50;>50.
(b) specified in 6 bands: primary; junior secondary; senior secondary; vocational; graduate; post graduate.
(c) specified in 4 bands: =<4; 5-25; 26-49; =>50.
(d) specified in 4 bands: <P60K; P61K-500K; P501K-1.5M; P1.5M-P8M.
(e) specified in 4 bands: Zero; <10%; 10-50%; >50%.

Table 8. Influencing Factor Analysis

The survey provided data on: a) age, b) gender, c) nationality, and d) the educational level of the respondents. The analysis suggests that respondents in more formalised enterprises were more likely to be male, non-citizens and more highly educated. The survey also provided data on the characteristics of the enterprise and other business factors. These included: a) the enterprise size according to the number of full-time-equivalent employees; b) the total sales for the previous financial year (1997/98); and c) a proxy measure for whether or not the enterprise had

experienced growth according to the change in number of employees over the previous two years. Enterprise size was clearly a significant factor, but was correlated to a higher degree when measured by turnover (annual sales) than it was when measured by number of employees. There was also some evidence that more formalised enterprises were more growth-orientated (they were more likely to have expanded their workforce in the previous two years) whereas in less formalised enterprises the workforce was more likely to have contracted.

These observations should be treated as tentative in accordance with the number of respondents and the biases in sample response that have already been highlighted. However, there does appear to be a high degree of correlation between enterprise size according to turnover and formalisation, which suggests there is a distinct financial threshold for formalisation when expressed in terms of ownership of ICT resources. For enterprises that fell below this threshold, this represented a serious constraint on growth and development. However, actual levels of take up of ICTs were associated with a further factor. Levels of ICT use were very low in manufacturing sectors serving domestic markets – textiles and clothing, building materials, furniture and fabrication. For example, only 9% of local manufacturers utilised computer-based software for accounting (this compared with 52% for the whole sample). In contrast, the use of ICT was fast becoming a minimum requirement for survival in the market in other services sub-sectors as well as for manufacturing exporters. This was reflected in data concerning the contribution of exports to turnover which was significant in relation to formalisation. This is illustrated amongst 17 enterprises that were identified as exporting more than 50% of their output, 15 of which were located in Archetypes 3 or 4. Non-exporting enterprises, however, remained more evenly distributed throughout the four archetypes. It would appear therefore, that size (measured financially) and sector are the two most significant discriminating factors.

The survey data highlighted predominantly internal factors associated with formalisation. External factors were only covered in relation to information sources (Table 5) which indicated that personal, social and business networks were prioritised far ahead of institutional networks in use and importance. Butler and Hansen (1991) suggest that the essential feature of increasing formality is the ability to form strategic external linkages with other enterprises or institutions. The evidence suggests it is predominantly business networks, rather than institutional networks, that play a primary role in Botswana. There was little indication from the survey data of precisely how business networks contributed to formalisation, but the case studies served to demonstrate that where formalisation had occurred, external linkages forged with key customers or suppliers had been instrumental. This is illustrated by the observation of a critical incident in a non-networked ICT user (Archetype 3) where relationships between the enterprise owner and key customers had driven formalisation (Box 3).

Francis Wooden Furniture (FWF) had built up a good reputation as a local sub-contractor and established contractual linkages with South African-based main-contractors and material suppliers. FWF – as the sub-contractor – worked on the basis of detailed specifications, drawings and bills of quantities specified by the main contractor, as well as receiving formal information inputs from suppliers – quotations, bills of quantities, catalogues, etc. FWF was often required to put together quotations very quickly, in response to the narrow deadlines of the main contractors. Their suppliers were able to prepare detailed bills of quantities on the basis of contractor specifications – cutting down significantly on FWF's workload for submission of tenders. This taught FWF how to deal effectively with contractors, and they made effective use of computer-based ICT to organize their internal IS in a way that was compatible with the requirements of their customers.

Box 3. Case Study Extract – Francis Wooden Furniture

A further case of an intensive ICT user (Archetype 4) provides a supplier-driven example.

Botswana Printworks (BP) specialised in offset lithographic printing as well as handling upstream printing processes including layout, typesetting and desktop publishing (DTP). A key role was played by suppliers in formalising IS for BP in two respects. First, an investment of US$72,000 was made in Apple DTP and printing technology, purchased from the local Apple Centre. This enabled BP to receive technical back up and support after installation, as well as knowledge inputs via a structured training program delivered by a DTP specialist. Second, material inputs (paper, plates, film, etc) were purchased in Botswana from a sole supplier – Copy One. The supplier was able to hold a full range of material stocks that covered all BP customer requirements. This helped to keep BP inventories low. BP had access to the Copy One stock lists via email, giving rise to efficient information exchange and timely delivery. Close relationships with suppliers enabled BP to formalise their internal IS, making effective use of ICT across a wide range of business processes, including ordering, upstream DTP, delivery, invoicing and customer records. There was also a market cost driver that demanded more efficient IS in order to adequately control the low margins and the high overheads associated with the printing sector.

Box 4. Case Study Extract - Botswana Printworks

The two cases illustrated the ability of forward and/or backward linkages to provide, not only formal information, but also a range of complementary resource inputs that are required for formalisation to occur. Other resources included new knowledge and skills (e.g., vendors' tailored training programs), technical back up and support and other financial or non-financial incentives. In the cases observed, commercial (more often contractual) linkages tended to provide greater benefits than institutional linkages because they gave rise to greater two-way flows of information, and they also tended to be more permanent.

DISCUSSION AND RECOMMENDATIONS FOR ENTERPRISE ARCHETYPES

The following section provides discussion and some recommendations differentiated according to the four enterprise archetypes taking into account factors that were rated by the respondents as critical to the future success of their enterprises (Table 8).

Archetype 1

Although these enterprises had obvious potential for expanding their use of IS and IT systems, lack of finance and skills were a major constraint. Most could not afford to buy a personal computer and, if one was bought, most would find it difficult to obtain commensurate benefits in the short/medium term. Financial constraints were clearly expressed as the critical factor for this group (Table 9). Current non-IT users were more likely to benefit from improvements in their existing information practices using the IS and technology to which they already had access, such as via improved inter-personal communication skills; enhanced financial management skills to improve business efficiency, and training in sales and marketing techniques. Within such enterprises, it was only when basic skills and/or financial stability had been significantly improved that any true benefit was likely to be gained from applying computer-based IS.

% who consider factor 'critical' for future success of enterprise Ranked according to total sample (a)	*Archetype 1 (n=18)*	*Archetype 2 (n=25)*	*Archetype 3 (n=21)*	*Archetype 4 (n=26)*	*Total Sample (n=90)*
Increasing skills of workforce	33%	48%	48%	46%	44%
Increasing/diversifying sales	44%	36%	48%	46%	43%
Additional financing	67%	68%	24%	15%	42%
Production technology upgrading	56%	48%	14%	27%	36%
Better marketing	44%	40%	24%	27%	33%
Improving financial management	39%	44%	14%	27%	31%
Developing new products/services	28%	32%	29%	27%	29%
Introducing new ICTs	22%	44%	24%	19%	28%
Entering export markets	28%	8%	29%	12%	18%
Forming Alliances/partnerships	11%	12%	5%	12%	10%

(a) 4-point response scale from 'critical' to 'not very important'.

Table 9. Critical Success Factors

Archetype 2

This group of enterprises can be described as 'first-footers' in small business computing, and they were widespread throughout the manufacturing and service sectors covered in the survey. Although they had access to computers on their business premises, 40% of the sample made no effective use of business applications. Amongst the remainder, by far the main use was word processing, and only 20% had computerised basic business processes such as customer invoicing and basic accounting functions.

This group frequently lacked the managerial capacities and shared many characteristics with Archetype 1, and the same preconditions for enhancing basic management and information skills would apply. Nevertheless, there were greater formalisation pressures within this group than those felt in Archetype 1. Such enterprises had specific needs for ICTs, as in the printing and publishing sector, where competitive pressures driven by rapid technological change meant that enterprises had to 'adapt or die' in relation to ICTs. Such enterprises had also expanded their use of ICTs in order to achieve compatibility with customers or suppliers, and adopted ICTs to keep up with competitors or to create an aura of modernity. This is reflected in the 44% of enterprises that regarded introducing new ICTs as critical to the future success of their businesses (Table 9).

Archetype 3

These enterprises – found mainly in the technical services, IT services and the tourism sectors – made considerable, networked use of ICTs. 75% had computerised accounting and customer invoicing systems. Other business functions, such as inventories, customer and supplier records, were computerised in about 60% of enterprises. Email and the Internet were used very or quite often by 57% of these enterprises, and computers were used for more complex business activities such as project planning by 24% of respondents.

However, case study evidence suggested that such enterprises applied and adapted such systems on a largely ad-hoc basis. In the cases observed, they lacked the employee skills to effectively manage the systems which had been developed. In other cases, the development process was deficient. Increasing the skills of the workforce was expressed as the factor most critical in the survey (Table 9). Overall, such enterprises would have benefited from a more strategic approach to managing information, in order that the costs and benefits associated with improving both ICT-based and non-electronic systems could be evaluated. They also required complementary inputs to support their current systems, such as a better understanding of marketing and promotion as a precursor to making more effective use of the Internet.

Archetype 4

This group of enterprises showed similar characteristics to Archetype 3, but had achieved a higher degree of formalisation and integration of their business processes. This was reflected in their far higher use of computer-based applications both for external communications and internal storage and processing of information. For example 42% of respondents used ICT for project planning and most key business processes were automated by about two-thirds of enterprises. Case study evidence suggested that some of the implementation problems associated with Archetype 3 enterprises had been overcome. It is not clear, however, precisely how all such

enterprises had internalised the knowledge and skills required for successful IS development. The case studies did illustrate, however, that effective business linkages combined with strong leadership and ICT knowledge of the business owner/manager had been key factors in the formalisation process.

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Results suggest there was a large unmet demand for formal information and a need to move away from wholly informal IS. Personal and social networks generated predominantly informal information, and remained largely inadequate for creating the critical mass of information and resources required to stimulate internal IS development. However, it is demonstrated in this study – as well as more recently by Mutula & Brakel (2006) and Jorosi (2006) – that personal and social networks continue to substitute for absent market functions in Botswana and for market access they remain essential. It is also clear that assigning the label of formality or informality is less important for entrepreneurs than the quality attributes assigned to information. Results from the case studies indicated that informal information had a tendency to be more appropriately presented, whereas formal information tended to be more accurate. Informal information was timely, but formal information was more complete, whilst relevance varied considerably.

The evidence associates both internal and external factors with formalisation of IS. The research was able to provide only tentative conclusions concerning a broad range of possible influencing factors. Most significantly, there appeared to be a clear financial threshold below which computer-based IS remained unaffordable. However, for SMEs which crossed the financial threshold, it was effective use, rather than ownership, which became the key issue. There was a strong positive association between the size of the enterprise (measured in financial terms) and the extent to which computer-based IS had been used to automate cross functional internal processes. However, there was also a sector-based disparity, which identifies manufacturers as considerably more constrained than service-based enterprises. The exception was manufacturing exporters which have been faster to adopt ICTs both for internal processing and external communications.

Greater formalisation also seems to be associated with greater frequency of use and importance attributed to external business linkages. Information networks tend to change during the process of transition, from primarily social linkages (informal information) to primarily business linkages (formal and informal information), and from non-commercial institutional linkages (e.g. enterprise-support agencies) to commercial institutional linkages (e.g. trade missions, tax offices). Transition is required, therefore, to access more formal sources of inputs (especially money, skills and materials), in order to access more distant and larger customer markets, and in order to improve management decision-making for control/co-ordination – thus facilitating expansion and growth. Failure to cross the transition point means failure to access these inputs and markets, failure to build management capacity and, hence, failure to grow.

Key linkages included those formed locally, but more critically those that extended beyond the borders of Botswana, thus allowing access to information from regional and global sources.

Commercial forward or backward linkages not only provided good quality information, but also helped to provide complementary resources that contribute to building internal competency and overcoming skill constraints. This suggests, in line with the views of Dawson (1997) and Gibson (1997) that enterprise inputs (of finance, training, technology, etc) are most effectively delivered, at least in part, via private sector providers. In this way, more valuable business linkages are created – substituting for less valuable institutional linkages – for which there was less evidence of a strong formalising effect.

Overall, the analysis carried out on the data from Botswana provides findings that are in line with more recent research from other sub-Saharan African countries surveyed in the background to this article. This is particularly the case with regard to the widespread information gaps observed and the considerable constraints for formalisation of IS that have been identified. In this respect there appear to be some contextual similarities between Botswana and other sub-Saharan African countries. Botswana, whilst commanding greater overall GDP per capita resources, displays many of the constraints and inequalities of less developed countries. In fact, in some areas – such as technical and vocational skills – Botswana is lagging behind larger, but poorer, countries. There are, however, important contextual differences. Botswana's development status is considerably higher than most other countries within sub-Saharan Africa, and because of a low population and a high GDP per capita wealth, does not offer the same developmental challenge that poorer highly populated countries present. Countries from the Southern African Development Community (SADC) may provide more direct comparison due to their similar population size and developmental status. These would include Namibia, Swaziland and Lesotho. In common with these countries, Botswana may be considered at an advantage due to proximity to South Africa – which has facilitated a high degree of inward investment in the SME sector. This has provided for a considerable infusion of new skills and technology – including ICTs – in a relatively short space of time. This has placed Botswana at a considerable advantage compared to other sub-Saharan countries.

There are a number of implications for the research area that arise from this study.

Firstly, the study provides an exploratory framework drawing primarily on IS concepts. However, as the findings demonstrate, information needs and resource needs are inextricably intertwined, and in most areas of enterprise activity information is merely a means to an end. There is a danger, therefore, in adopting an IS approach to researching the enterprise, that its importance will be over-emphasised. In this respect, and for enterprises that are less formalised, information takes a lower priority and should be viewed purely as a means to obtain more critical primary resources (money, markets and skills). To attempt to understand these enterprises purely as an information processing system is clearly inadequate. As enterprises grow, however, their use, and formalisation of information also grows, and the systemic approach becomes more relevant. In enterprises, and sectors, undergoing a high degree of informatisation (including digitisation), and where information is a key resource, an information-centred systemic approach becomes ever more applicable.

Secondly, alongside other studies (Chiware & Dick, 2008; Jorosi, 2006; Moyi, 2003) this study suggests that market failures may be the result of information failures: related to imperfect information, inadequate institutions and intermediaries and poor quality information. The

solution to market failure, therefore, is to facilitate more effective information practices in terms of information quality, processing and communication. In this respect further research is required into the role of external networks and the networking behaviour of entrepreneurs. For most micro-enterprises networks remain limited to their locality and dependent on social interaction. Whilst a network-based approach remains of importance, it becomes critically important that within the model people are placed before both information and technology. As this study and many others have shown, effective enterprise networks build upon people networks initiated through face-to-face contact and via the building of trust.

Thirdly, Esselaar, et.al (2007) suggest greater focus on the role of mobile-cellular networks which have had considerable impact on informal as well as formal sector enterprises in sub-Saharan Africa since this research was conducted. However, as Esselaar's research concludes, mobile technology has had significant impact on business communications, but displays limited functionality in terms of IS development. Therefore, this study still supports the view that a computer-based network model becomes more relevant as enterprises grow.

Finally, there remains a case for correcting market failures through external means (e.g., reforming institutions, enabling policies, ICTs, etc) but it should be recognised, and the findings of this research largely support the view, that successful enterprises are created primarily through the efforts of networks of successful entrepreneurs. This underlines the point that investing in technology-based networks of communication – whilst essential for encouraging modern business practices – will only go a short way to solving information-based market failures. There is still a danger that an over-concentration on information-based market failures will underplay more important resource-based failures relating to a wide range of economic, political and human resource-based factors.

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ENDNOTES

[i] At the time of the research there was estimated to be around 50,000 micro-enterprises (predominantly non-registered with 1 or 2 paid employees); 6,000 small enterprises (employing less than 25 employees); and 300 medium enterprises (with 25-100 employees) in Botswana. Some 80% of SMEs were urban-based with 60% of registered enterprises located in the retail sector, mainly small food retail outlets and general stores. There were significant numbers in other sectors – manufacturing, construction, tourism, transportation and business services (SMME Taskforce Report, 1998).

[ii] In line with the mixed method approach, the field study was conducted in 2 phases. The 1st phase took place from Dec 1998 to March 1999 and consisted of a postal questionnaire survey. The 2nd phase took place from Sept 1999 to Oct 1999 and concentrated on providing more detailed and in-depth data through direct observation and open-ended interviews comprising 8 case studies. These were selected from the survey respondents on the basis of purposive sampling to represent all 4 enterprise archetypes (2 from each) and also to reflect a range of manufacturing and service based sectors.

[iii] The pilot study (Jan-March 1998) conducted face-to-face interviews with a sample of ten urban and peri-urban enterprises and administered a pilot questionnaire survey to a sample of 50, as well as a series of key informant interviews. As for the main survey, the sample for the pilot survey was selected randomly from the Botswana Registry of Establishments (CSO, 1998). Those who replied to the pilot survey were excluded from the population from which the main sample was drawn.

[iv] The survey sample upon which the questionnaire was administered was constructed according to a stratified random sampling technique. The sampling frame was the Botswana Registry of Establishments which lists details of registered enterprises according to the Botswana Standard Industrial Classification (BSIC). SMEs were defined as enterprises officially registered in the Botswana Registry of Establishments (CSO, 1998) and in line with definitions used locally (SMME Task Force Report, 1998). A random sample of 60 enterprises each from eight broad sub-sector groupings was drawn from the frame leading to a sample size of 480 enterprises. The sub-sector groupings included in the sample were selected in order to provide a broad spectrum of SME activity in Botswana covering both manufacturing and services. The sub sectors chosen were also those where citizen participation in the formal sector was being encouraged. It was hoped this would provide for policy relevant findings as well as broad sector coverage.

[v] The response rate is comparable to other survey-based studies in the management IS literature (Pinsonneault & Kraemer, 1993). It is also comparable to previous survey based studies that focus on sub-Saharan Africa and SMEs (Molla & Licker, 2005; Thong, 1999). Especially considering the limited research culture and the specific context of SMEs in sub-Saharan Africa not used to filling out questionnaires and giving out information about their operation, we consider the 90 responses adequate for the purposes of an 'exploratory' research study.

[vi] Briscoe (1995) details a study of 161 owners of small urban-based businesses conducted in Botswana during the early 1990s. The purpose of this study was to obtain information about the characteristics and background of a new generation of urban small business owners. The enterprises surveyed had been in business for varying periods of time ranging from 2 months to 3 years, with the majority counted as successful enterprises on the basis that they were 'trading' enterprises.

[vii] Validity can be further examined by comparing the size profile of the sample response with the total population of SMEs in Botswana. Official data published in 1998 indicated that there were approximately 6000 small-scale and 300 medium-scale enterprises in Botswana – defined according to local definitions (see Endnote 1). The survey elicited responses from 45 small-scale and 25 medium-scale enterprises indicating a bias toward medium-scale. A further 20 enterprises were classified as micro with 5 or less employees. It was decide to include these in the analysis as the majority had sales in excess of Pula 60,000 per annum and because they were representative of a group of enterprises that had potential for formalisation.

[viii] Spearman's rho is a measure of correlation and indicates the magnitude and direction of the association between two variables that are on an interval scale. The magnitude signifies the strength of the correlation. The closer the correlation is to +1 or – 1, the stronger the correlation. If the correlation is close to zero, there is no correlation. The direction of the correlation tells us how the two variables are related. A +ve correlation implies a +ve relationship (as one increases the other does also). A –ve correlation implies a negative relationship (as one increases, the other decreases). E.g., spearman's rho of +.428 indicates there is a strong positive relationship between a preference to source information from abroad and an increasing level of formalisation according to the enterprise archetype categorisation. This was, therefore, a suitable means of bi-directional correlation. The K-S (Kolmogorov-Smirnov) test was applied where 2 samples were compared (e.g., male and female respondents) and is based on the maximum absolute difference between the observed cumulative distribution functions for both samples. When this difference is significantly large, the two distributions are considered different. Thus a higher numerical value suggests a greater difference in distribution of enterprises according to the four archetypes.