CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

The literature reviewed was guided to the meet the two objectives of the work, which are:

- to ascertain what existing technical and socio-economic environments affect the usability of the Internet as an information resource in developing countries
- to establish the degree of usability of the WWW as an information conduit in Botswana and other developing countries

The literature review is not limited to Botswana but broadly examines the context of usage of the Internet in developing countries and issues related to business information for small-scale businesses. Furthermore, the literature review provides background information and sets a context for the case study on usability of the Internet in Botswana, by examining specifically electronic business information, internet connectivity, and design issues related to Botswana.

The assumption underlying this work is that information is a tool for development while the Internet has become *the* information transmission medium of the century. In the literature the UNDP (2001), the World Bank (1998) and Kirkman and Sachs (2001), among others, have hailed the Internet as the technology that will bring developing economies into the information society. Not all agree with this opinion. Simpson (1994) and Heeks (1999) warn us that the Internet has become a status symbol for developing countries rather than a development tool. In this chapter, the researcher reviews literature on the relevance and usability of the Internet in developing countries while paying particular attention to the use of the WWW by small businesses in Africa.

In order to ensure that literature review remains relevant to meeting the objectives this work, it is arranged under the research questions. In this way literature pertaining to each question is reviewed under each research question.

3.2 What are the prevailing environmental conditions that encourage or discourage Internet connectivity?

A limited exposition of the literature on the state of the Internet in developing countries was given in chapter one. This section expands on that and gives a broad outline of the state of the Internet in developing countries.

The Internet in developing countries is hindered by the fact that equipment is expensive, telephone lines are poor, electricity is unreliable, illiteracy is widespread and definitive guiding government policies are absent (Mbambo 1996; Kole 1999; UNDP 2001; Haddad and Macleod 1999). The situation is not uniform in all developing countries (World Bank 1998). *The World Development Report* (1998) states that countries such as Singapore, India, Thailand, Brazil and South Africa that need to produce all their own electronic equipment have advanced in further in Internet usage than those countries that import all computer components. Those countries that import fewer components are increasingly using the Internet to conduct business (Kirkman and Sachs 2001). On the other hand, African countries that are emerging from wars or that are still engaged in wars, such as Somalia, Mozambique and the Democratic Republic of Congo, demonstrate the lowest levels of the Internet usage and expansion (Jensen 2001). For these countries, being linked to the Internet is not a development priority.

Onyango (2000:198) says that developing countries have gone through many development paradigms, which he characterises as

- The green revolution
- Import substitution
- Export orientated industrialization
- Export processing zones
- Industrial parks

- Economic structural adjustment
- Economic liberalization
- Informatics revolution (the most recent paradigm)

Onyango contends that African leaders embraced each of these paradigms with no subsequent critical evaluation of their impact. He asserts that all these programmes have created no real sustainable development in Africa. He cautions that although the global informatics era offers African countries an opportunity to "leapfrog" their deficiencies in their development process, the history of failed and abortive development projects may repeat itself if the informatics era is blindly embraced in an uncritical and planned way.

Chisenga (2000:179) also believes in the possibility of "leapfrogging" over past failures and deficiencies. He says that participation in the global information society will help to create partners for manufacturing and business, expand virtual campuses and bring the interactive learning environment to the classrooms for the benefit of African children. All these factors would contribute to the development of Africa. Ochieng (2000), however, disagrees with the both Chisenga (2000) and Onyango(2000). He argues that the possibility that the necessary infrastructure, equipment, education and attitudes will arise suddenly in the African context is somewhat unrealistic in the light of the crippling deficiencies and problems that beset most African countries (largely as a result of centuries of colonialism and post-colonial non-development). In support of his argument, Ochieng notes that the majority of the

African populations still live in rural areas, are illiterate, and have no access to fresh water, electrical grids or sewerage systems – let alone telephone lines. They therefore could not (in their present condition) benefit from all the advantages of the information society – even if these were offered to them on a plate.

Kirkman and Sachs (2001:61) contend that the IT "revolution offers powerful weapons to foster economic growth. It is time developing countries benefited from them". They note that e-mail has proved effective in transmitting vital information about diseases in Africa. They further note that electronic commerce is fast extending to developing countries. In spite of this optimism, they also cite the following difficulties that hinder the expansion of the Internet in developing countries:

a) lack of national strategies (i.e. neither governments nor private sectors are taking the lead in devising policies for the use of the Internet).
b) Telephone services are still largely analogue and not digital.
c) There are too few skilled IT workers in African countries. School curricula generally exclude computer education. Available resources in schools and universities are inadequate for IT education.

Kirkman and Sachs (2001:64) cite the following examples where the Internet has been used in creative way in developing countries:

- In Brazil, 11 million people paid their taxes on-line in the year 2000. This saved the government $10million.
- Chile anticipates that putting bids on a web site will save government $200 million in administrative expenses.

The view is corroborated by Thyfault (2001: 65), who identifies the sale of handicrafts on the Internet as a booming business. Thyfault notes that e-commerce can make it possible to work from home (this enables users to save money because they do not have to pay office rental and other expenses), and that e-commerce can bring in more income and so build confidence. Thyfault (2001) identifies the following web sites as leaders in e-commerce for developing countries:

- Novica.com
- E-Ziba.com

Although these examples give one cause for hope, there are not many such encouraging anecdotes from the developing world. In India, for example, only two million have access to the Internet out of a population of one billion people (Thyfault 2001).

Some experiments with intervention mechanisms have also been undertaken in developing countries. According to the Association for Progressive Communication (APC), telecentres have been used widely in Central America and South Africa to provide communities with sites where people can use telephones and the Internet (APC

2001). Wireless technology is also being increasingly used as substitute for poor telephone lines (Thyfault 2001). Universities and businesses are fast using the Internet to link themselves to other institutions around the world (Mbambo 1999).

According to the literature cited in the previous paragraph, the situation is not entirely hopeless. Despite the difficulties mentioned above, the literature shows that organizations at the micro level are making the Internet a vehicle for development by harnessing it for the benefit of communities. It should however be noted that the people who benefit from the Internet in this way are very much in the minority(Jensen 2001; Kirkman and sachs2001; Ochieng 2000).

3.3 What measurable benefits accrue to communities when they use the Internet?

Research on such benefits is scarce. Duncombe and Heeks (1999) assert that current research on the value of the Internet, conducted via list servs, is not sufficiently objective because it provides views of users of the e-mail instead of the communities they serve. They add that ICTs (Information Communication Technologies) are neither a necessary nor a sufficient condition for communication in developing countries. To a limited degree a study by Kole (2000a) corroborates this view. In the study of African women and communication in English-speaking Africa, Kole (2000a) identifies five methods of communicating information between organizations and their clients in Africa: face to face, phone/fax/telex/, postal mail, radio, e-mail and the Internet. The

table below shows how the study ranked the effectiveness of these communication mechanisms.

Table 5 Success rate of media in reaching grassroots organisations (Source: Kole (2000a) *African women speak into the Internet: research report of an electronic survey of African women* http://www.x54all.nl/~html Table+17)

Success rate	Mode of operation	Preference points	Average score
1st most successful	Face to face	127	7.94
2nd most successful	Phone/fax/telex	124	7.75
3rd most successful	Postal	112	6.59
4th most successful	Radio	83	6.92
5th most successful	e-mail	81	5.40
6th most successful	Internet	27	3.38

The study distinguishes between e-mail and the Internet because although some of the organizations had e-mail, they did not have full Internet access. According to Kole's study, the most effective way of communicating between small-scale grassroots organizations and their clients is face-to-face interaction. The second most effective way is telephone and fax, while the e-mail and Internet were ranked fifth and sixth respectively. Panos (1998:2) concurs that in Africa while the radio reaches approximately 75% of population, TV reaches 40% and the Internet reaches only 0.1%. Panos says about radio and television: "In access and coverage terms they beat ICT hands-down now and in the future" (Panos 1998:2).

A qualitative study by Association of Progressive Communication and FEMNET (2000) surveyed the effect of the Internet on 40 organizations. All forty respondents

indicated that the effect was positive in varying degrees. Researchers noted the following points:

- The Internet improved communication.
- The Internet allowed work to be done in a more flexible manner.
- The Internet opened new doors for work with partners in remote parts of the world.

The Association for Progressive Communication,(2001) an organization that has made the Internet more accessible to disadvantaged communities, has listed ten examples of organizations that have used that have used the Internet to benefit the communities served. Three examples of the kind of examples they use are listed below.

(1) Sexual harassment legislation in India. Women with limited access to the Internet who has been sexually harassed used the Internet to lobby support and to download legislation and reports of law cases to support their arguments in court. The positive outcome of this was a Supreme Court judgment in their favour.

(2) Wartime communication in Yugoslavia. At the height of the war in Kosovo, an organization called Zamir provided a letter service to refugees. As the telephone system was inoperative, volunteers would type letters and send and receive mail on behalf of refugees.

(3) EcoNews Africa. EcoNews published news on its web site about the plight of the Masai who were being evicted from their native land so that mining could take place. This generated attention all over the world and caused the decision to carry on with mining was eventually reversed

These stories illustrate how strategic use of the Internet can help to solve community problems. The examples mentioned above are drawn from all over the world and include cases from Eastern Europe, Asia, America, Africa and England (APC 2001).

Heeks (1999) disputes the value of such findings. He is of the opinion that the poor in any community are not among the *recipients* of information technology. He cautions that on- line studies cannot accurately assess the impact of ICT because they tend to express the preconceived hypotheses of practitioners (Heeks 1999). He furthermore asserts that developments in ICT lend themselves to invalid generalisations. The more generally accepted view is that the "poor population must gain eventually from adopting technology, because technology is development" (Heeks 1999:12).

In both his publications, Heeks (1999; 2000) argues that it is advertising that has led people to have inflated ideas about the effectiveness of ICT. To counter such views on the usefulness of the Internet, the International Centre for Development Research (IDRC) sponsored several studies that undertook to measure the relationship between the impact of ICT and increased development (Hafkin & Menou 1998). In 1995 the IDRC sponsored the Capacity Building for Electronic Communication in Africa

Project (CABECA). This project trained organizations in Africa in the use of ICTs. Researchers subsequently assessed the extent to which the trainees made use of the Internet and further support was provided where needed. CABECA has also developed a tool for measuring the impact of ICTs in development. The IDRC has sponsored the application of the La Franco method of measuring the impact of ICTs on development. This method of measurement is also used in Latin America (Association of Progressive Communication 2001).

While Kole (2000b), Hafkin (1998) and FLAMME (2000) all detect an increase in the speed of communication among users of their technology, Heeks (1999) and Panos (1998) contend that these studies are skewed because they have been conducted among Internet *enthusiasts*. They contend that this bias does not realistically reflect typical practice in communities that are served. Hafkin (1998) recommends that there is a need for a set of indicators that would measure impact and be easily usable.

3.4 What policy considerations are in place?

Marcelle (1999:8) defines policies as integrated sets of decisions, guidelines, laws, regulations and other mechanisms that are geared to directing or shaping activity. Marcelle notes that policies are not static but that they require regular updating and analysis. If the Internet is to be more widely used in developing countries, the private sector and government will have to cooperate with regard to policies (Bamako 2000).

Kole (1999) contends that the lack of a policy to guide Internet expansion in developing countries is a major hindrance to the expansion of the Internet.

In his report on occurrences in a developed country, Oppenheim (1998:46) says information policy encompasses any policy that impacts on the flow of information, whether printed or electronic. Oppenheim further states that there are different approaches to national information policies. We can distinguish various levels of information policy in a country. Thus we may distinguish between the information policies of the national government and local government. He asserts further that electronic information transfer transcends national boundaries and will have to be implemented in terms of national agreements and protocols.

Oppenheim(1998) adds that the United Kingdom government has pursued deregulation of telecommunications as a way of encouraging of the Internet even though a national information policy does not exist (Oppenheim 1998:50). The UK government's support for Joint Academic Network (JANET), and its subsequent support for SuperJANET, which was meant to be an improvement of the former JANET further demonstrates their commitment in this regard. In spite of this, recent legislation that allows the UK government to police the Internet calls the UK's government's commitment to supporting freedom of expression on the Internet into question (APC 2000).

In the 1980s UNESCO encouraged developing countries to formulate information policies. Many did not complete this exercise because it was driven externally by the needs of UNESCO and not by the internal needs of the countries concerned.

Kgengwenyane (2000) is of the opinion that lack of a national information policy has retarded the growth of Internet use in Botswana. This view corroborates that of Oppenheim (1998:56), who notes that the government of Singapore has welcomed the Internet and encouraged participants to use it by putting its own information on the web and encouraging the private sector to do the same. Oppenheim notes that countries such as China and Vietnam have discouraged citizens from using the Internet, and set up policies that retard Internet usage and therefore there is no widespread usage of the Internet.

Although there is no information policy in the United States, President Clinton instituted the National Information Infrastructure (NII) in 1996. This activity was coordinated from the office of the vice-president, Al Gore, (Carbo 1998) so that could be accorded maximum prestige. The philosophy behind this initiative was to expand and extend the capacity of many existing mechanisms and so create a national information infrastructure that could service more and more schools, homes, and institutions in the private sector. The president and his associates hoped to encourage the community to use the information super highway more and more and so create an "open information society". In the opinion of Carbo (1998), the NII has succeeded in doing what it set out to achieve.

Dugan and Cheverie (1997), however, have emphasised the extent of disagreements about information policies in the US. The first problem they note is that although there has been no central and coordinated information policy over the years, the unprecedented expansion of global electronic networks demand that new problems be solved even before existing problems have been resolved. A second point of disagreement arises out of the conflict between the government's express desire to reduce federal involvement in people's everyday life while at the same time pressing for legislation to ensure privacy and safety. What has therefore emerged in the USA is the realization that information policy is not static but rather that it is evolving and dynamic (Dugan & Cheverie 1997).

In South Africa the need for an appropriate policy to provide guidelines for the information industry was articulated in 1995 by the then deputy president, Thabo Mbeki, who told a G7 meeting that development of information policy was a multi-sectoral activity that required careful planning (Wilde & Mncube 1996). It is envisaged that the ultimate form of South African information policy will include the following principles: freedom of access, adoption of ICT, and the collecting and dissemination of information. Wilde and Mncube (1996) add that it is crucial for such a policy to be "people-centred". They have identified government, the telecommunications industry, libraries and civil society as interested parties in drawing up such a policy.

It emerges from the literature that while government policy creates a framework for expansion, it may also deter the growth of the Internet. It would appear that it is not the existence of a *policy*, but rather a supportive government policy, that encourages expansion.

3.5 Internet and small business information

In the following section, the researcher reviews previous research on how available information technologies were used to meet the information needs of small-scale business entrepreneurs in developing countries generally, and Botswana in particular. The review furthermore explores how effective the Internet is in obtaining and presenting information to SMMEs. The research also examines at length the issues inherent in the design and development of web sites, and finally reviews policy issues that affect web access and use in Botswana.

"Internal SME information management and the use of external information services designed for SMEs is dependent for its success upon sufficient resources and work tools in the hands of the user...There is definitely a need to increase the use by SMEs of the information sources available to them "(Kalseth 1995:39).

Kalseth emphasises how critical is the need for access to business information in the quotation above. A cursory examination of business information reveals that available business information is nearly wholly concerned with the big business sector and that

only a limited amount is available on small business enterprises. Johnson (1996) and Introna (1997) and many others have written on the role of information in large and formal businesses. Literature on small business enterprises generally is scarce, while such information on Africa is even more limited. Available literature on small business in Africa focuses on the problems of small-scale business and seldom discusses the role of information as such in small business enterprises. However, Briscoe (1994), Sunny and Babikanyisa (1996), and Mchombu (1996) mention lack of information on business procedures as one of the obstacles that minimises the possibility of small business enterprises being successful in Botswana. Alexander, Gay, Mbere,and Setimela, (1983) and Silitshena (1992) specifically cite lack of relevant information as a definite barrier to the success of SMMEs. Heeks (1999:8), however, cautions that "information is not the be-all and end-all of enterprise development" and that it must rather be related to "other factors in the environment that enterprises need to prosper like access to skills, access to markets, access to finance".

3.6 What type of information is sought by SMMEs?

The type of information sought by SMMEs depends on the type of SMMEs. Heeks (1999) states that the type of information sought by entrepreneurs is dependent on the needs of an enterprise at any given time. This need varies from day to day and depends on circumstances. It is also dependent on the extent to which entrepreneurs are able to recognise and articulate their need for information (Mchombu 1996). The identification of an information need is the first requirement in the information seeking process.

Johnson (1996) confirms the above assertion by Mchombu when he cautions that before one can determine exactly what kind of information is needed by SMME entrepreneurs, it is essential to understand *the psychological determinants* of information needs and information seeking. The information seeking process is determined by several stimuli, which are both internal and external (Johnson 1996).

3.6.1 External influence

Johnson (1996:3) states that information seeking is often the first step towards social change – both for individuals and a society. He further asserts that information seeking provides individuals with "critical assistance that enables them to also deal with an effective level of organizational life" (Johnson 1996:3). External stimuli for seeking information include:

- a need for change in the environment
- a pending reward (emotional or material) for obtaining such information
- the minimisation of uncertainty

3.6.2 Internal influences

Kriekelas (1983:6) defines seeking as an "activity that is undertaken to identify a message that satisfied a perceived need" while Kaniki (1991) is of the opinion that people seek information when they have to make a decision or solve a problem. Information seeking, therefore, appears to be externally stimulated by a need for change. It is processed internally and influenced by one's knowledge. Johnson (1996:3)

concludes that because of the *psychological* determination of information seeking, it is possible that information seeking may not take place – even when individuals urgently need information.

3.6.3 Information needs

Information needs in business refers "to factors which business owners consider to be most critical for the survival and/or growth of the enterprise". Heeks (1999), Koskiala and Antila-Olkku (1995:64) state that SMMEs entrepreneurs neither articulate their information needs nor do they recognize them. Koskiala and Antila-Olkku (1995) and Mchombu (1996) state that it is possible that the current scarcity of information about the needs of SMME entrepreneurs arises out of their inability to articulate their information needs. Mchombu (1996:18) asserts that although business requires high information input, most business people in small business enterprises in Africa do not possess any high degree of technical information awareness. In industrialized nations, on the other hand, entrepreneurs articulate information needs and seek the information they need (Clausen (995:44).

Literature on the type of information sought by SMMEs in Africa generally is (as has already been noted) extremely scarce. Mchombu (1996) and Heeks (1999) undertook two studies that established the information seeking trends of micro-enterprise entrepreneurs in Botswana. Although Mchombu (1996) focused on women, the study provides useful information from which one might infer trends about information

seeking in Botswana. It is particularly relevant to this study because the majority of entrepreneurs in the group studied are women.

Clausen (1995:45) states that in Denmark and Finland, SMME entrepreneurs look for information on markets, prices, and partners from public libraries and business information centres. In Botswana, data on the type of information that small business SMMEs seek from information centres is extremely scarce. Banks do not catalogue their inquiries by type of user and the National Development Bank reports simply supply information about the loans they have granted loans – but not the type of user making the inquiry. The table below records how Mchombu (1996), Briscoe (1994) and Duncombe and Heeks (1999) have identified the information needs of SMMEs.

Table 6 A comparison of information needs from various literature sources

Mchombu(1996)	Briscoe(1994)	Heeks (1999)
1. Business management 2. Technical skills 3. Financial Information 4. Legal information 5. Marketing information 6. Sources of raw materials 7. Nursery schools	1. Sources of finance 2. Training 3. Market 4. Education	1. External Financing 2. Trained personnel 3. Management training 4. Source of skilled personnel 5. Information that would lead to increased sales 6. Existing customers 7. Land or premises 8. Laws and regulations

Although Mchombu's study was limited to women, the stated information needs do not vary greatly from those identified by Briscoe (1994), who states that SMMEs need

skills in business management, marketing, financial information, and so on. Some of the differences appear to be differences in expression. Thus Briscoe (1994) identified skills required by entrepreneurs while Mchombu (1996) identified information needs. Duncombe and Heeks (1999) also identified information needs. The specifications of what entrepreneurs need remain similar. Table 3.2 above juxtaposes the similarities in information needs established by these three studies over a period of five years. It is instructive to note that the information needs did not change between 1994 and 1999.

3.7 What types of sources are currently used to access information?

Kalseth (1991:45) states that those who run Danish SMMES use the reference sections in public libraries to read directories and encyclopaedias and obtain statistical information. They also widely consult *Fortune* and other current periodicals for information on markets and products. Hansen (1995:55) states that SMMEs satisfy their need for knowledge by using formal and informal networks. In Botswana, Mchombu (1996) identifies the following pattern in the satisfaction of the information needs of women entrepreneurs:

Table 7 Information needs of women entrepreneurs (Source, Mchombu:1996)

Type of adviser	Percentage of satisfaction
BEDU advisers	55%
Field service advisers	37.5%
Radio	25%
Local newspapers	7.5%

Table 7 indicates that extension workers meet most of the information needs of women entrepreneurs. The table above indicates that BEDU advisers best meet the information needs of most women – followed by the Ministry of Commerce's field service advisers, the radio and finally the local newspaper. *One should note that there is a strong dependence on oral information as opposed to text information.* It was evident that oral advice was preferred to the information obtained from newspapers. Duncombe and Heeks (1999) also confirmed that people tend to depend on informal one-on-one information provision.

A significant finding of Mchombu (1996:54) is that *40% of the sample had nobody to ask for information when they had a problem* – while 27.5% depend on relatives and family to solve their problem and others obtain their advice from banks and from extension workers. Duncombe and Heeks (1999:21) also found that SMMEs in Botswana depend on their "internally generated knowledge and experience" as an informal source of knowledge. This reveals that *a large proportion of people depend on oral information from close associates* and do not consult formal and established information centres. Mchombu (1996) and Duncombe and Heeks (1999) confirm the findings of Dhua (1990), who states that SMMEs in China often also use *informal* channels to gather information.

The literature seems to indicate great reliance on printed material is characteristic of studies conducted in Norway, Denmark and Finland. In developing nations entrepreneurs came to rely on oral sources of information. Mulindwa, (1987), Kaniki

(1991), Mchombu (1995) and Duncombe & Heeks (1999) all concur that while SMMEs ignore printed information available in libraries and other information centres, they do tend to rely largely on oral and informal information.

3.7.1 Are the available sources adequate?

Mulindwa (1987:21) states that small business entrepreneurs in Botswana do not consciously search for information in formal existing sites such as libraries and reading rooms that contain large quantities of printed information. The predominance of text information in those institutions renders them unusable by people who are unable to articulate their information needs and possess only limited reading skills. They prefer to seek advice from oral sources in the form of advisers (Mchombu 1996:45). The literature indicates the use of available information centres (in the form of libraries, BOCCIM and the University of Botswana Business Clinic), where extension services and the information provided are limited. The utilisation of the services offered by these organisations is hindered by the preference that people have for oral information rather than printed information (Mchombu 1996; Mulindwa, 1987).

The call by Silitshena (1991), Alexander, Gay, Mbere, and Setimela, (1983) and Mchombu (1995) for information for SMMEs is a clear indication that existing services are inadequate.

The literature shows that the success of small businesses in Botswana depends on the availability of information on various aspects of business such as markets and cheap sources of raw materials (Alexander 1983; Mchombu 1995; Sunny & Babikanyisa 1996). Some of this information is available in print format in scattered government offices. While some information providers currently produce or compile some information for entrepreneurs in SMMEs, Mchombu (1995) and Silitshena (1992) have noted that existing formats of information are inappropriate for small business enterprises. It is evident from the literature that the existing mechanisms of information provision are print-based, not easily updateable, and are generally not examples of proactive information provision in the information age.

3.8 Access

Access refers to the ability to physically reach, process and use information. Access may be conceptual in addition to being physical.

3.8.1 Socio-cultural barriers to accessing information

Socio-cultural barriers that hinder the flow of information are not physical barriers. They are social factors that discourage information use.

3.8.1.1 Is gender a barrier to accessing information?

Hopwood (1989) indicates that woman's work and family relationships are so intertwined that they leave little time to concentrate on business issues that might be separate from the family. Because of this women have developed informal networks for sharing information. Although this study was conducted in Zambia, the results concur with other studies by Mbambo (1995) and Mchombu (1996) indicate that information provision for women should not be isolated from women's multiple roles but that they should be related to them in a meaningful way. The studies suggest that separate information services for women in developing countries should be replaced by easily accessible places or sites where women can efficiently and swiftly obtain the information they require (Mbambo 1995; Mchombu 1996).

Mchombu (1996) indicates that 40% of women studied did not know where to go for information. Alexander et al (1983) indicated that the majority of extension service providers were men. This made it difficult for women freely to consult each other because they were intimidated by the presence of "powerful" male advisers. Sunny and Babikanyisa (1996) indicate that women in the small-scale sector need skills. The proliferation of information advice centres will not provide information for women entrepreneurs (Raseroka 1992). A mechanism that is less male-dominated and therefore not threatening to women should be developed and located in places frequented by women.

When we consider how extensively information communication technology (ICT) is used to access information, we find that fewer women than men have access to ICTs (FLAMME 2000). Marcelle (1998) notes that ICT in Africa is a male-dominated domain, that women are excluded in all levels of employment in the field of ICT, and that women also tend to possess ICT equipment far less frequently than men. Marcelle calls on African countries to re-examine their ICT policies and to make them gender-inclusive. Kole (1999) concurs with Marcelle when she says that a limited access to ICT leads to a limited access to the Internet and its resources. The literature seems to demonstrate that women are disadvantaged in terms access to the Internet and that there are largely functionally illiterate.

3.8.1.3 Is illiteracy a barrier to information access?

Graff (1981:2) states that the value of literacy for "achieving fulfilling, productive, expanding and participating lives of freedom in modern societies is undoubted and unquestioned". Robert (1973:4) notes that although the value of literacy is recognised in these terms and that its critical role in development is well documented, it remains debatable as to whether it should be regarded as the key to development. Literacy, loosely understood to refer to the ability to read, is regarded as a crucial factor because it is indispensable to those who wish to acquire information that is presented other than in oral form. However, "in a push button society a minimum of literacy is needed to know which buttons to push" Galtung (1981:277). In spite of this, the availability of information for development in print form continues to exclude those who cannot read

or write from obtaining and utilising such information (Mbambo 1995). "By giving the illiterate the impression that books are the only possible vector of culture... the illiterate communities are soon reduced to silence" (Verne 1981:302).

Braun (1999) states that illiteracy is the main obstacle to the spread of information in developing countries. "Computers and their audio-visual features present great advantages, ...a mouse click on a visual and a user can listen to information" (Braun 1999:79). Braun also cites anecdotal evidence from Guatemala that assert that women market their products on the WWW. Thus, although they are illiterate, they have an opportunity to hear and be heard on the net. The literature demonstrates that the practice of making print or books the only means of access to information deprives those who are illiterate from gaining access to information. This practice is very widespread in Botswana – where most information is only available in printed form. Braun (1999) cautions that the Internet and the WWW might possess exactly the same disadvantages as print media unless they are used as in a multi-modal way that includes hearing and seeing.

3.8.1.4 Language

While most of the literature is available in English, the majority of the population in this category are Setswana-speaking. This creates a barrier because whatever information is available is not usable to this population (Mchombu 1995). Thirty percent of the population of Botswana is illiterate (UNESCO 1997). The same

percentage have not received any formal education and so do not speak English. Most of the development information is available in English (Raseroka 1995). Thus language emerges as a limiting factor in accessing information. Language is also a barrier on the Internet (*Futurist* 2000). A *Futurist* editorial states that most African languages are not found on the Internet. Everard (1999) adds that the language of the Internet is English and cautions that even simple translations may distort a message. This can limit the extent to which Africans, who are not native speakers of English, can benefit from the Internet.

3.8.1.5.Education

Schram (1964) states the education creates a desire for information. Ngwainmbi (2000) concurs with this view when he states that in Africa, education levels increase in direct proportion to access to computers, the Internet and current information. The justification for extending education was to enable people to read – especially for information rather than for pleasure (Ngwainmbi (2000)). Those who do not read cannot read print information. They may be described as being (in a certain sense) "voiceless" people in the information age.

3.8.2 Physical barriers to accessing information

Physical barriers to accessing information are the features of particular geographical locations and the presence or absence of infrastructure.

3.8.2.1 Are there distinct differences in the way that urban and rural access information?

The Botswana National Library Service Act of 1962 provides for a library in each of the major towns and villages in the country. Reading rooms are provided for more remote areas and book boxes are provided for even more remote areas. However, there is no legal obligation for information providers other than the National Library Service to disseminate their services to remote areas. Information provision in rural areas is therefore the domain of the Botswana National Library Service (Mulindwa 1987).

All other information centres are in Gaborone and Francistown, the two major cities. Concentration of these services in urban centres and the absence of these services in rural areas create a disparity in information service provision (Boadi 1992). However, literature that describes the extent of the disparity is not available.

3.8.2.2 Is distance from the capital city a hindrance to accessing information?

Mulindwa (1987) states that there is a concentration of information services in the capital city. The University of Botswana's Small Business Clinic and other small business information providers are concentrated in Gaborone. The physical location of resources in Gaborone necessarily prevents those in rural areas from accessing the same resources (Mchombu 1995). Distance from the capital is therefore a hindrance to access to information. Furthermore, Heeks (1999) indicates that there is a higher

telephone density in urban areas than in rural ones – the factor that creates a potential disparity in the provision of ICT in rural areas.

3.8.2.3 Access to computers and infrastructure

It has already been stated elsewhere that the cost of computers and Internet connectivity far surpasses the monthly wage of the average person in Africa (US Internet Council 2000). The average African neither owns a computer nor has access to a computer connected to the Internet.

Ticoll (2000), Mbambo (1996), and Ngwainmbi (2000) agree that there are serious infrastructural hindrances in Africa. Because telephone communications are poor and the electricity supply is erratic, this makes the Internet unreliable.

3.9 What ICT solutions have been applied?

If one wishes to construct an appropriate ICT policy, one needs to understand the information environment. Duncombe & Heeks (1999) state that an information environment has been established in Botswana. Access to information has also been espoused in *Vision 2016*. The same document also calls for applications of appropriate Information Technology in order to develop "an informed society".

3.9.1 Internet connection

The editorial of *Futurist* which the researcher mentioned above (*Futurist* 2000) indicates that satellites that are positioned in stationary orbit may offer an alternative to the poor telephone line services that make Internet development difficult in Africa. In Botswana there are currently six ISPs (Internet Service Providers) for a population of 1.5 million. Botswana's telecommunication infrastructure is said to be the best in Southern Africa. However, use of the Internet in business is limited to a few organisations (Heeks 1999).

3.9.2 Computerized databases

Kalseth (1995) includes use of information technology as one of the requirements for setting up of business information services for SMMEs in Denmark. Clausen (1995) and Hansen (1995) call for the more innovative use of emerging and available information technology in the provision of information for SMMEs. Clausen (1995:42) further states that such a service should be available within close proximity to small businesses. Although these examples are drawn from Europe, they may be applied elsewhere in the world. Taiwan has developed appropriate applications for developing countries. Jy-Sheng Ke (1995:46) states that by providing information to small business entrepreneurs, the country enabled them to compete with big businesses in Taiwan. Extensive use of the Internet and specialized local databases empowered the small business sector to become an engine for economic growth. In Singapore national business libraries make extensive use of IT to provide information to small businesses

that cannot afford their own equipment for Internet access. Although none of these applications is from Africa, they show how appropriate technology can be used to provide information to SMMEs.

Kole (1999:1) states that as new ICTs proliferate, the use of ICTs in Africa increases proportionately. In Botswana the Fredrick Ebert Foundation (in cooperation with the Ministry of Commerce) has established the Business Linkages Database. The database lists mainly small-scale textile industries. The purpose of the database is to market organizations in the textile sector industries in Botswana and to encourage the purchase of their products (Business Linkages Database 1999). When it is complete, the database will be available on the Web and on CD-ROM

3.9.3 Use of multimedia in business

The databases advocated by Kalseth (1995), Clausen (1995) and Jy-Sheng Ke (1995) tend to be letter-based databases that require basic literacy and recognition of symbols on the keyboard to manipulate them. Multimedia on the other hand present information in a way that is more accessible to semi-literate people (Keen 1997:7). This distinguishes it from all previous IT applications in information provision. Mulit-media provides simulation and three-dimensional presentation. This facilitates effective decision-making, enables remote interaction with customers, and enables users to develop their knowledge and understanding of the product they need. Keen (1997), however, cautions that although the production of a CD-ROM itself is about one dollar, the cost of creating a multimedia environment with scanners, colour printers, storage capacity, editing software, video

cameras, etc, is between $20 000 and $80 000. This price is beyond the means of small business people. However, companies with many users realise savings in use per user. The larger the user population the greater the saving.

3.9.4 The benefits of multimedia in business

We may list the following benefits:

1. Multimedia cuts down on training time as many trainees can be trained simultaneously at different location without duplicating the human resources. (Keen 1997).

2. Multimedia facilitates interaction with customers (Keen 1997). CarMax, for example, sells used cars via electronic kiosks. Customers set their car requirements and finance needs. The system then produces colour photographs of cars in that price range.

3. Three dimensional computing facilitates three-dimensional perceptions. Architects use this to create virtual buildings and facilitate a " virtual walk" through the building.

4. Animation. Animation mediates ideas across quickly and simply and is used widely in the United States courts to recreate events (this enables jurors to "see" the events as they occurred at a scene of the crime).

5.Multimedia is used on the Internet. WWW technology widely uses multimedia to create video, audio, graphics and three-dimensional virtual realities.

6. The management of knowledge is another application of multimedia. Introna (1997) says that knowledge is "information put to use". Multimedia makes information natural by appealing to our senses of sight, hearing, and touch. "Traditionally computers have made information that which intellects respond to" (Keen, 1997:12). By making information available naturally, and by diversifying the way in which information is captured, stored, and communicated, multimedia radicalises knowledge management. Current knowledge is crucial in business. The possession of information provides a critical advantage (Introna, 1997). Multimedia reduces interpretation time by using, audio and visual through the use of hypertext and hypermedia, which facilitates browsing. The growth and expansion of the WWW shows how eager people are for information they can assimilate and use (Keen 1997).

3.10 Design and implementation of a good web site

This section outlines what the specifications of a well designed product are. It outlines the process of user analysis, design, development, prototypes and evaluation.

Any discussion on the use of the web is not complete without a discussion of design. There are many different methods of web site design. The Women's Net methodology brings together stakeholders to produce a web site using HTML (Womensnet 2001). In

the commercial sector it is the designer who creates a site and who matches the product with the specifications of a customer. Such a task includes target population analysis, goal analysis, prototypes and evaluation. Evaluation is crucial. This establishes the usability of a programme.

3.10.1 What are the specifications of a good web site?

Mouty (1999) lists the following principles for designing a web site:

(1) Determine why users will visit your web site.

(2) Establish the proficiency level of users of product. What are their web skills?

(3) Identify the search engines used by most of your users so that they can access your site.

(4) Enable users to be aware of where they are.

(5) Make good use of landmarks so as to avoid revisits.

(6) Make good use of cues so that readers can easily navigate the site.

(7) Make good use of people's natural problem-solving skills.

Hodgkinson and Cronje (1995:8) state that when one designs for adult learners (users), the following should be borne in mind. The majority of them tend to:

(1) be active learners

(2) be experience-based

(3) be experts in their own areas

(4) be practical "hands-on" people

(5) be task-oriented

(6) be problem-centred

(7) seek solutions

(8) know the reward for doing certain tasks

(9) seek skills to empower themselves

(10) be self-directing

(11) be externally motivated (i.e. by their environment)

(12) be internally motivated (i.e. by psychological recognition, self esteem, etc.)

There is some overlap between what Mouty (1999) says and what Hodgkinson and Cronje (1995) have also stated. Careful selection of appropriate principles from each of these authors should be considered in the planning stages of design.

3.10.1.1 Development

The process of developing an appropriate multimedia product must be informed by the context of creation as well as the use by the end user. Mouty (1999), Boyle (1997) and Desmarais (1994) exhort developers to remember that multimedia is a tool, and not an end in itself. This point is critical when one designs for people in developing countries who are not familiar with technology. Desmarais further adds that when the developer develops a multimedia programme, he or she should concentrate on the application of the final product. Monty asserts that the development stage must be informed by the analysis stage.

Philips and Jenkins (1997) state that the development cycle starts when the idea of the project is brainstormed and an initial design is then produced and refined into a storyboard. During the process, prototypes are developed and evaluated until the developers agree on what should go in. Once the design is complete, the production process begins. Desmarais (1994), Phillips and Jenkins (1997) and Boyle (1997) all agree that at the final stage the programme is tested, de-bugged and tested on end users.

Desmarais (1994) suggests the following steps in the process of development: identifying the problem, design, and authoring:

1. Identifying the problem (needs assessment)

Identifying a problem may also help with the definition of an appropriate solution. This process also determines the content of the presentation, target audience and the environment. He adds that it is also important to define the objectives of the project.

2. Design

At this stage, all graphics, colours, animations and texts that will go into the program are determined.

3. Authoring

This stage combines the elements of needs analysis, design and creative development. The author will also need to know the type of hardware in use and whether it will support the application (e.g. Will the configuration support audio, or motion type display?) Performance of the computer will also need to be considered: size of processor, RAM, band with, and operating system. The author will also consider the type of authoring package and whether it will support what the author wants.

3.10.2 How should these specifications be adapted to meet the needs of my target population?

3.10.2.1 Design

Desmarais (1994) says that a design strategy sets out developmental guidelines. This stage links specification with needs analyses. In the process the focus should be on the user. Other central issues that must be considered include the following:

a) Scope of the project. In this process one asks why multimedia are used and not other products. The limitations and appropriateness of the product for the ultimate user group should be considered.

b) Interactive programme. Desmarais (1994) suggests that at this stage the developer decides on an appropriate user interface. Available choices are menu-driven, exercise-driven and simulation. Exercise driven interfaces are used in training hypermedia databases. They are flat in structure and similar to menu-driven, but users determine where they want to go. Simulation shows the consequences of an action and provides feedback. This is very useful in training.

c) User requirements. Specifying user requirements is crucial in this process, as well the mechanisms by which users will provide feedback.

d) Media selection. Here the type of media the participants will use is listed.
At this stage one asks how the user will use the system. This could include questions like: Will the users type in words? Will they be standing or seated?

e) Acknowledgments. A mechanism for indicating that the system has received input from the user is also important. Sometimes acknowledgement is sufficient without feedback. Mouty (1999) adds that designers should be aware of current multimedia on web technology schemes, response times and users' platforms.

3.10.2.2 Creative development

This stage involves the creative development of the product using graphics, audio and video. Collaboration at this stage tends to produce more effective work. The components of this stage are:

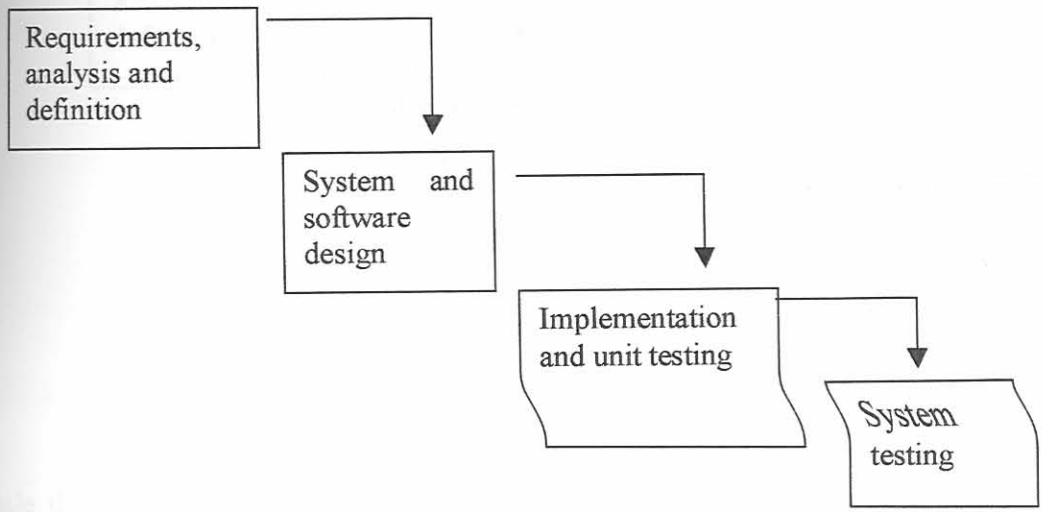
a) Script writing. This involves the writing of specifications; deciding whether narrative, simulation, or lecture-type presentation will be used; organizing the sequence of presentation; highlighting important points; reducing content on screen to minimize confusion; and writing a draft script.

b) Storyboards. This refers to the selection of graphics to accompany the text. The storyboard writer and the scriptwriter need to agree on content. Desmarais (1994:71) says the rule of thumb is "to include any information that might alter the screen".
Some of the detail that Desmarais (1994) says should be included in the process of designing is omitted by more recent designers like Phillips and Jenkins (1997), and Boyle (1997). Specialist teams now perform the various tasks while authoring packages make alteration of prototypes easier (Philips and Jenkins 1997).

Phillips and Jenkins cite several models of designing. The models outline the steps in the process of multimedia development. Although the sequences seem to change, the stages remain similar: analysis/development, design, evaluation and implementation. The various models are illustrated in the following three diagrams.

Figure 3 The water fall model

(Source: Philips and Jenkins 1997:37)

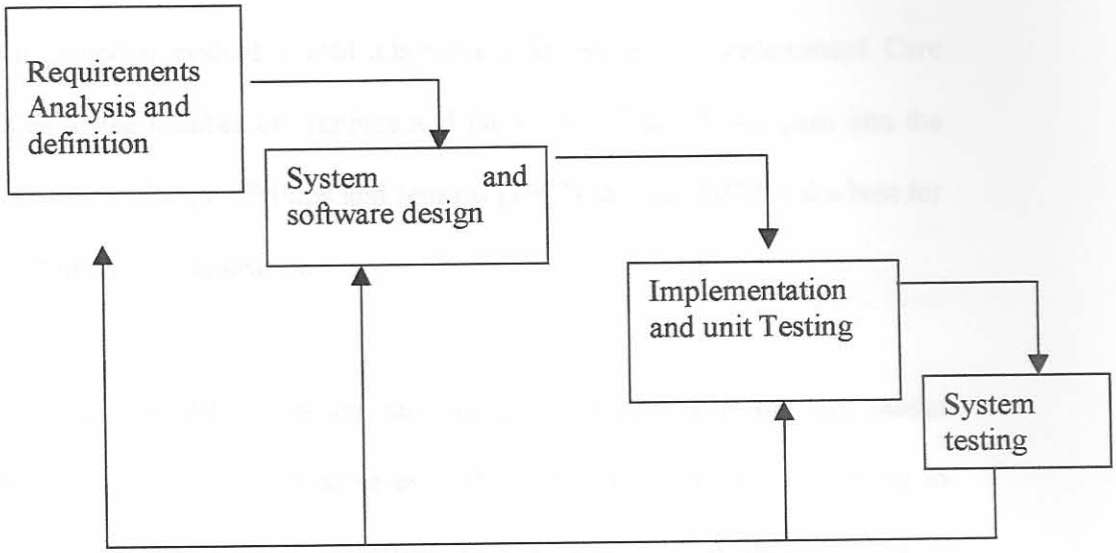


Research questions that establish the degree of usability of the WWW as an information conduit in Botswana and other developing countries

This model assumes that the design is completed before the work starts. If any changes in the environment which leads to significant changes in the project, the work start will have to be re-start from the beginning again. This model has been deemed inflexible and is therefore not frequently adopted (Phillips and Jenkins 1997).

Figure 4 The incremental prototyping model

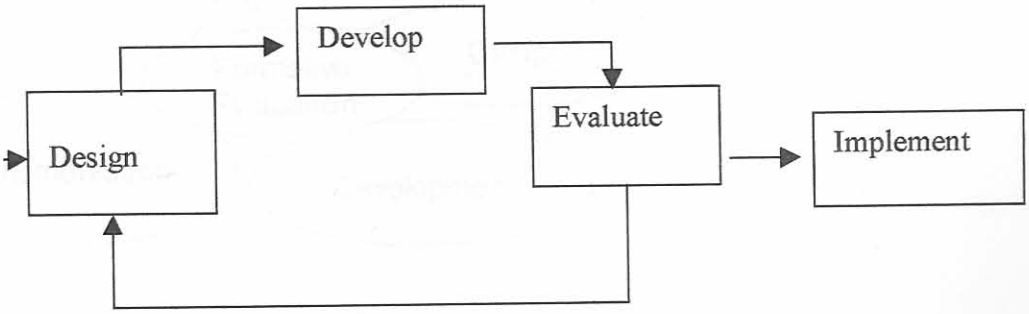
(Source: Philips and Jenkins 1997: 38)



While this model is similar to the waterfall model, the steps are repeated wherever necessary. When using this model, prototypes are created and tested many times. If one fails, a new one is created until an acceptable prototype is achieved.

Figure 5 The interactive multimedia (IMM) model

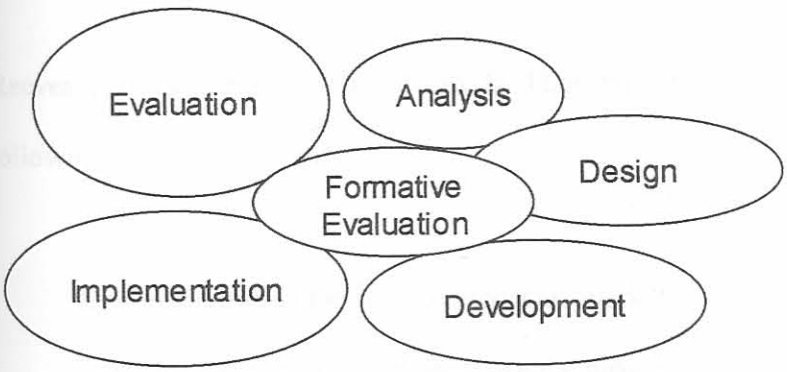
(Source: Philips and Jenkins 1997:38)



The process begins with design, moves to developing, then moves to evaluating, and then goes back to design if changes are necessary. Implementation is the final stage. In this model, the project is evaluated until it is acceptable before it is implemented. Care should be taken in the number of graphics and the extent of detail that goes into the prototype as this may change. Phillips and Jenkins (1997) say that IMM is the best for developing multimedia for education.

Hodgkinson and Cronje (1995) say the daisy model of designing is the best model because at every stage there is formative evaluation. The designers are compelled to return constantly to the primary objectives of the project. The daisy model is represented diagrammatically below.

Figure 6 The Daisy model



3.10.3 Does my database meet these specifications?

After a prototype has been developed, it is tested. This section discusses what the literature says about different types of evaluation.

3.10.3.1 Evaluation

Thornton and Phillips (1997:128) state that evaluation is the process of assigning value to an item. They add that in multimedia development the term refers to answering questions that arise during the development and implementation of the multimedia product. They recommend that the most effective way of evaluating multimedia is to list questions that could be used to interrogate the model – questions such as:

- Is it stimulating the learner?
- What is the long-term impact?
- How can the design be improved?

Reeves and Hedberg (1997), quoted in Thornton and Phillips (1997), suggest the following types of evaluation:

- Document evaluation (do the processes work?)
- Formative evaluation (can users use the program?)
- Summative evaluation (was learning effective in the short term?)
- Impact evaluation (was there any long-term retention of knowledge?)

Hodgkinson and Cronje (1995) add that dynamic evaluation tests whether users can use the program.

Boyle (1997) says evaluation is an essential part of the development process. There are two types of evaluation: formative and summative. Formative evaluation occurs throughout the development process and informs the development process, while summative evaluation happens at the end of the project. It examines whether the system has succeeded overall. Boyle (1997) further states that evaluation produces qualitative data that is useful in reshaping the design of the product. While quantitative evaluation yields figures that may be more objective than qualitative measures, they are not so useful for shaping the design of a programme.

Boyle (1997) cites three categories of people who may be interested in evaluation:

- Designers
- Managers and funding agencies
- Users

All these categories will require different forms of evaluation. Designers are interested in feedback that will influence the development of a product. To them the distinction between formative and summative evaluation is artificial. Managers may be interested in a cost-benefit type of evaluation that indicates whether the product justified the resources that were spent on it. End users may only be interested in whether the end

product helps them to achieve stated goals. "The evaluation method adopted should meet the needs of the interested parties in a cost effective way" Boyle (1997:201). Hodgkinson and Cronje (1995) conclude that whatever the form of evaluation adopted, the criteria for evaluation should be established first.

3.10.3.2 Types of Evaluation

Boyle (1997) cites three methods of evaluation:

Observation. The designers who want to see that users are satisfied with the system observe users at work on prototypes. Observation can be structured or unstructured. A set of criteria is drawn up beforehand and observers check how users perform against these. Preece (1993), quoted in Boyle (1997), says this method is rather expensive

Interviews. Structured and unstructured interviews to gather both qualitative and quantitative data are conducted. Users respond to the interviewers as they use the product.

Questionnaires. Users work independently of the developer, and then complete questionnaires as they get to a section.

3.10.4 To what extent does my database fulfil the needs of my target population?

In order to establish whether the product meets user needs, Hodgkinson and Cronje (1995) and Mouty (1999) suggest that a summative evaluation should be conducted before the product is finally distributed. Hodgkinson and Cronje (1999) provide the following checklist to be used in summative evaluation.

1. Content
- Correctness
- Connection with syllabus
2. Presentation
- Appropriate
- Clear
3. Feedback
- Motivational
- Remedial
4. Language use
- Appropriate
- Correct
5 Documentation
- Clarity
- Completeness

6. Educational approach

- Development thinking
- Construction and ownership of ideas
- Understanding and negotiation of meaning

7 Use of thinking skills

- Lower level
- Higher level

8. Technical quality

- Free from execution errors
- Ease of use

Boyle (1997), Desmarais (1994) and Mouty (1999) all concur that whatever method is used to gather data is always context-specific and may not necessarily be used on another model. However, information gathered must be used to make recommended changes in the web site. Although the studies cited give the basics of product design and are relevant to this research, Mouty (1999) is the most relevant as the study relates to the development and design of web sites. She says that the cornerstone of web evaluation is *usability*. It tests whether the site does what it was designed to do. If it is an informative site, does it inform? If it is commercial, can a whole transaction be completed?

Usability studies can be:

- Context -specific
- Data-driven
- Descriptive (as opposed to prescriptive)
- Flexible

Some other general questions that Mouty (1999) asks are:

a) How is the site used?

b) Is the site to be used by a large audience?

c) What are the reactions to the site?

d) How responsive is the site?

e) What is the access rate of information seekers?

f) How long does it take to find desired content?

g) How is the site affecting users' attitude and beliefs?

h) How is the site affecting users' behaviour on performance?

i) How is the site affecting the organizational culture on performance?

j) What are the short-term benefits of the site?

k) How is the site affecting long-term outcome?

3.11 The relevance of the web as an information delivery tool

Daly (2000) suggests that measuring the impact of the Internet in a society is not easy. However, a grid that outlines desired ends maybe useful. Each of the components in the

framework can be considered by itself. Kole (1999), and Heeks (1999) argue that the World Wide Web offers unique opportunities that assist small businesses to survive and transfer their business. Glynn and Koenig (1995) point out how traditional information centres have neither provided small business enterprises with access to pertinent information nor have they guided them in the efficient use of information. Their study suggests that the Internet could provide small business with cheaper access to information because bigger companies advertise their business there. Ticoll (2000) on the other hand indicates that the Internet is not a panacea for the problems of SMMEs. It should not be viewed as an end in itself but rather as a means to an end. "It is not about dumping the equipment" (Ticoll 2000).

The World Bank advocates the potential of the WWW and ICTs generally to contribute to the growth of small business enterprises, and through them to stimulate development on a national scale:

> "This new technology facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formation and execution and widen the range of opportunities for business and the poor (World Bank 1998:9)."

Heeks (1999) states that ICT has a role to facilitate both receipt and transmission of information. He however cautions that ICTs by themselves do not alleviate poverty and bring development; the specific application of ICT to SMMEs should be considered.

Hoffman (2000) cites the relevance of the Internet to electronic commerce activities. The wide availability of credit cards in developing countries would make use of the Internet for e-commerce a reality. Mullen (2000) indicates that Motorola is sending one satellite into a low orbit that will facilitate e-commerce in developing countries. He says that e-commerce will not expand while there is a reliance on poor telephone infrastructures. *The Economist* (Issue 8189, 2000) says that e-commerce will not be fair for developing countries because smaller companies will be unable to compete for customers with larger companies. The article also provides examples of how the government of Thailand promoted e-commerce by passing a law that stipulates that all invitations to tender must be done on the web in order to enable small business to identify and link with related organisations.

3.12 What policy considerations are in place?

Vision 2016 (1997:119) demonstrates the Botswana government's commitment to the adoption of ICTs.

> The next millennium will usher [in] an information driven society throughout the world. To ensure participation of Botswana in these developments, an information age working group will be created with a mandate to formulate a national information vision, policy and information technology strategy.

A deliberate effort by the government has led to computerisation of most government operations, a networking of government office with e-mail and the WWW (Heeks 1999). Government policy often translates to practice in other sectors. The deregulation of the Botswana Telecommunications Authority has facilitated the free flow of information (Heeks (999). Botswana as a tele-density of 17.95 per 100 inhabitants and the Internet users' ratio is 33.42 (World Telecommunications Indicators 1998). The literature suggests that Botswana has a telecommunications policy that facilitates access.

The Economist (2000) suggests that IT policies need to be matched with other policy changes before benefits can be realised. It states that policy on trade, investment and related matters may have to be changed so that fair competition can be encouraged. Marcelle (1998) suggests that government policies on the Internet should take into account gender disparities in access to computers, education and other development resources.

3.13 To what extent can the WWW be a tool for information delivery in Botswana?

There are currently six ISPs in Botswana. According to Heeks (1999), 50% of 61 respondents to his research had Internet access, 40% used the Internet very often, 33% used it often, and 24% did not use it very often. In response to the question of how important the Internet was to their work, 30% said it was very important, 37% said that it is quite important, 20% stated that it was not very important, and 13% that it was not important.

Heeks (1999:87) concludes that at present in Botswana the Internet is being used as a method of accessing information rather than as a tool of business. According to this study, a good number of SMMEs in the tourist sector have developed web sites. Braun (1999) indicates that in West Africa, and South Africa too, the tourism sector has embraced the WWW and set up web sites that detail their activities. Heeks (1999:95) notes a similar potential in Botswana when he says "the business owner has no effective contact outside Botswana. Is it possible that a wider European market information could be accessed through the Internet and a web site presence could be used as a marketing tool?"

3.14 Conclusion

The literature reviewed reveals the usage of the Internet in devloping countries is at an embryonic stage. In relation to Botswana specifically, the literature review shows that business information for SMMEs in Africa generally, and in Botswana in particular, is scarce. It further indicates that the current information available in print format, and in English, does not meet the requirement of SMMEs. Literature from the industrialised nations and from East Asia shows that extensive use of information technology applications helps to speed up the process of accessing information. It has also been well demonstrated in the literature that the most appropriate selection of ICT is critical for information exchange. The selected media must be relevant and usuable by the target population. Research by Heeks (1999) shows that in Botswana an infrastructure and a potential for using the Internet exist – but that they need nurturing.