Information & Communication Technologies (ICTs), Poverty Reduction and Micro, Small & Medium-scale Enterprises (MSMEs)

A framework for understanding ICT applications for MSMEs in developing countries

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This paper provides practical guidance to UNIDO for the future development of projects involving ICT and MSMEs. The paper presents a framework for understanding ICT roles across a range of micro, small and medium-scale enterprise applications. The evidence base for the paper draws on a number of research projects conducted by the Development Informatics Research Group at IDPM, as well as from associated research and literature sources.

The paper will be presented at a panel at the World Summit on the Information Society (WSIS) workshop in Tunis, 16-18 November 2005.

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Executive Summary

The paper presents a framework for understanding ICT roles across a range of micro, small and medium-scale enterprise applications. The paper provides practical guidance to UNIDO for the future development of projects involving ICT and MSMEs.

MSMEs and poverty reduction

Expansion of MSMEs has the potential to contribute most directly to poverty reduction in three main ways:

- income generation and diversified livelihood opportunities for the poor of developing countries.
- providing more secure employment opportunities for the poor of developing countries.
- provision of other social benefits to the poor – i.e., enhancement of skills, increased self-confidence, increased participation of women, empowerment, and security against income loss.

Two different types of enterprises can be identified in developing countries:

- *Livelihood enterprises* – micro-enterprises that form the majority in both rural and urban areas delivering benefits in terms of livelihood assets. Few livelihood enterprises have direct access to digital ICT. They may possess a radio, and a minority may have access to telecommunication services.
- *Growth enterprises* – micro, small and medium enterprises (MSMEs) that show a greater business focus and which deliver broader/longer-term benefits of competitiveness, innovation and exports. Growth enterprise needs for information and communication reflects a greater degree of business maturity, and many such enterprises may already be ICT users.

The role of ICT

The promise of ICT to contribute to poverty reduction lies in its power to give poor women and men access to improved information and communications. ICT, broadly, allows for a reduction in transactions costs, improved communications with markets and within the supply chain, and improved information about new opportunities. ICTs can also improve the internal information systems of enterprises. More specifically, ICTs can:

- Provide reliable access to markets (local, regional and international) through increased use of affordable communications (phone, fax, email).
- Improve contact with suppliers, and transport links to and from markets (e.g., through databases of enterprises, products, and suppliers).
- Inform choices, particularly regarding prices of raw materials and finished goods, enabling better prices for enterprises when dealing with traders.
- Provide information about locally and internationally available non-financial business development services (BDS) (e.g., training schemes, business skills, and marketing).
- Provide direct or intermediated access to BDS (e.g., training packages, advice on better practice).
- Provide access to legal information, including information on contract law, tax law, registration and regulation.
- Provide improved access to information about financial services, and access to financial services (e.g., via micro-finance institutions – MFIs).

A value chain model of ICT application

In addition to the previously mentioned roles, this study also emphasises the role of ICT as a productive tool. ICT production is represented as a 'core' activity within the following 'value chain' model. In all, four direct value chain roles of ICT are defined for all MSMEs:

- ***Value chain core:*** using ICTs for the core operations of the enterprise, as for IT sector enterprises.
- ***Value chain boundaries:*** transactional applications of ICTs used to interface with suppliers or customers; mainly seen in terms of e-commerce applications.
- ***Value chain support:*** application of ICTs for access to information and decision-making.
- ***Networking support:*** use of ICTs in building networks such as through cluster development and linkages to other stakeholders.

Livelihood enterprises: ICT roles for livelihood enterprises will be mainly for value chain support and networking support; significantly through support for informal information systems. Access to ICT can be enabled through telecentre or other localised business information centres (BICs). However, ICT interventions for this type of enterprise should not be judged solely on monetary impact, as issues of governance, environmental sustainability and social benefits cannot be readily separated from enhancements to their communication and information systems for enterprise purposes.

Growth enterprises: They can support all four ICT roles. Research suggests that ICTs are of most direct value to growth enterprises. They are better placed than others to make use of ICTs, and they provide a greater capacity to generate wealth, employment, exports, innovation, and to build a wider range of local and external business linkages. Growth enterprise sectors (including the ICT sector) will play a critical role in increasing the volume of ICT critical mass within a developing country. A focus on ICT sector production of goods and services will emphasise organic growth – encouraging a step-by-step approach to building local capacity, at least, partially serving the needs of ICT consumers.

Intervention priorities

Livelihood enterprises represent the area of greatest need for intervention, but ICT-related (and other) interventions have greatest effect on growth enterprises. However, 'one size does not fit all' and targeted strategies are required because of the different roles ICTs play in different enterprise types.

For *livelihood enterprises* information is not that critical an issue; there are greater constraints that relate to markets, money, skills and motivation. They have the least capacity to meet information needs, and want to rely most heavily on enterprise support agencies to meet those needs. They need help building informal linkages. ICTs are of limited value.

Growth enterprises have a greater capacity to meet their information needs. They need help building business linkages. ICT can be of quite significant value and these enterprises should be the priority focus for ICT interventions: they are better placed than others to make use of ICT, and they provide a greater capacity to generate wealth, employment, exports and innovations.

There should be more focus on demand and less on supply-side interventions. For *value chain support*, enterprises need more help getting information on demand and on customers; and for *value chain boundaries* activity needs to stay customer –

rather than supplier – focused. Demand-side interventions should focus on development of linkages to customers (e.g., sub-contracting to local large customers; export support to link to overseas customers); and other marketing support.

Macro-level support
The successful adoption and effective use of ICTs by either growth or livelihood enterprises is crucially dependent on the environment in which they are operating. Full participation in e-commerce and the widespread adoption of ICTs for enterprise operations will require expansion of the ICT infrastructure and other essential services (such as electronic banking), the development of a strong user base to make it easier for enterprises to enter into e-commerce, and support services for MSMEs – such as public access facilities (telecentres). In summary, the essential macro-steps required to develop and promote ICTs amongst MSMEs are:

- Development of infrastructure and facilitation of access.
- Improved knowledge/awareness.
- Support for the adoption of the technology by enterprises and sectors.
- E-commerce and ICT sector development.

Meso-level support
The most effective intermediaries for MSMEs will be commercial organisations, and/or those able to add value to MSME goods and services by providing other marketing chain resources. ICT-capacity should therefore be built within:

- *Trade associations* – representing national (small) business sectors (e.g., tourism, legal and accounting, manufacturing, etc).
- *Chambers of commerce* – representing the private sector within districts or regions.
- *Umbrella associations* – national associations dealing with government.
- *Employers associations* – organised at a national level.

Interventions should concentrate on support for facilitation, technical assistance and incentives to encourage competitive performance of new and existing BDS providers, innovations, and the development of appropriate service products. One way to provide information services to MSMEs is to use ICTs to network the services that already exist, providing a single entry point (e.g., one-stop-shops); and operating the network and the support services on a commercial basis. Agencies should also focus more on policy advocacy pressing for better macro policy-level interventions. Given its high level of penetration, particular consideration should be given to the role of mobile telephony in value chain and network support.

Prioritised action plan

- Supporting the enabling environment for supply- and demand-related macro-level interventions, and adopting national strategies for ICT development.
- Awareness raising among donor and enterprise support agency staff about the role of ICTs for productivity and competitiveness.
- Development of demand-driven information services incorporating e-partnerships and development of local content with a sustainability requirement.
- Development of an authoritative knowledge base of good practice on ICTs through support for networking, including e-networking with business partners.
- Support the development of the ICT sector and ICT technical capability, and the localisation of IT sector support services.
- Development of integrated e-business support and productivity enhancement packages for MSMEs through sector strategies and demonstrators, such through the use of as e-appraisal tools.

1. Introduction: The Context of Poverty Reduction

The role of ICT in combating poverty and contributing to sustainable socio-economic development is subject to increasing debate. ICT has played a leading role in driving economic growth and development in the industrialised and new industrialising countries, whilst the eradication of poverty and hunger worldwide remains at its early stages, with evidence of growing inequality in much of the developing world and a deepening of the poverty crisis across much of Africa (United Nations, 2005).

On the one hand, ICT has the potential to promote global connectivity, economic prosperity, social development, good governance, and democracy, and thus create a conducive environment for the reduction of poverty (Grace et al, 2004; Dutton, 1999). Historical parallels are drawn, suggesting a pervasive role for technology leading to rapid modernisation: such as derived from the development of printing and the railways in previous eras. Furthermore, Castells (1995) highlights the importance of the emerging network society, strongly advocating that development without ICT in the current milieu is unthinkable, as ICTs are now fundamental for a country's potential to enhance their productivity and competitiveness, mobilise resources, build managerial capacity and develop the political systems that are required to achieve development goals.

On the other hand, significant concerns are raised about the effectiveness of ICT particularly for achieving optimal and fair distribution of resources. Gurstein (2003) questions the entire basis of the 'ICT for development' movement and argues that in the majority of regions there has proven to be little spin-off effect with minimum distribution of benefits within developing countries. It is argued that economic benefits from ICT will not be forthcoming until a country has sufficient wealth to make ICT penetration economically viable for the majority.

Despite the debate, ICTs for development has been widely endorsed by most multilateral development agencies and carried into their development programmes. In fact, the lack of ICT penetration and diffusion (the notion of the digital divide) is packaged as a development problem in its own right. Likewise, many of the corporate sponsors (Microsoft, HP, Cisco Systems), have established 'ICT for development' projects in collaboration with local or national governments and NGOs. In 2001, the OECD identified over one hundred donors funding ICT for development projects, while the World Bank Group has been estimated to fund between $1 billion and $2 billion in ICT projects annually (Wakelin and Shadrach, 2001). These include initiatives offering ICT access, telemedicine, e-learning, e-government, e-agriculture, e-commerce and e-democracy solutions to development problems. With such a plethora of largely uncoordinated activities taking place, questions are inevitably raised about the impact of such interventions, including the extent to which ICTs are impacting upon progress toward attaining the Millennium Development Goals (MDGs).

There is now greater emphasis on defining a role for ICT that is able to contribute to achieving the stated MDGs that have poverty reduction as their overriding priority. However, the indicators contained within the MDGs give little indication of a clear role for ICT. There is recognition within MDG 8 (global partnership for development) of the positive trends associated with the spread of ICT into the developing world, due to the revolution in communications facilitated via mobile telephony – with the most dramatic increases in network coverage and access achieved in the poorest

countries (United Nations, 2005). There is little reference to a broader role for ICT within the poverty reduction strategy papers (PRSPs) of individual developing countries, within which, ICT is not generally regarded as a strategically important component.[1]

There is still a need, therefore, to define more clearly how ICTs can be effectively integrated into practical strategies for poverty reduction.

The purpose of this paper is to focus on one area of ICT application that has direct impact on poverty – micro, small and medium-scale enterprise (MSME) development. MSME development is an area where considerable scope for ICT application has been suggested; a large number of initiatives have been developed; and a number of lessons have been learned through success and failure of those initiatives at the project level.

In most developing countries – particularly the poorest – micro and small-scale enterprises are the main source of employment and the main source of new jobs and incomes for the poor. Expansion of micro, small and medium-scale enterprise has the potential to contribute to poverty reduction in the following ways:

- Through expanding and providing more secure employment opportunities (in the formal and informal sector) for the poor populations of developing countries.
- Through the provision of other social benefits to the poor – i.e., enhancement of skills, increased self-confidence, empowerment, and security against income loss (ILO, 2005).
- Through securing greater livelihood security, access to productive assets, and economic opportunities for women.
- Through income generation and diversified livelihood opportunities for the rural poor, and to a lesser extent, the extreme poor of developing countries.
- Making markets work better for the poor, and enabling poor urban women, men and children to participate in, and benefit from, the urban development process.

The Digital Opportunities Task Force Report (2001) called for a greater focus on the role of local enterprise in igniting the conditions for sustainable development. It is recognised that local entrepreneurs are much better placed to gauge local demand and general business conditions than those from outside, and the emphasis should be on finding ways to enable such enterprise at the local level. Enterprise, therefore, is a key mechanism by which the so-called 'digital divide' can be bridged, thus focusing on ICT as an enabler of sustainable development. It is also recognised that the world is at a critical juncture in the development of ICT with a number of different technologies (e.g. mobile telephones, the Internet, and digital) coming together and with costs falling. This is likely to change fundamentally the way business is conducted.

[1] Research by the OECD scanned national priorities for poverty reduction and sector priorities in all 21 PRSPs to analyse how ICT is discussed. In the 21 analysed PRSPs, only 4 countries (Albania, Gambia, Mozambique, and Rwanda) define or position ICT as a strategic component for poverty reduction and discuss it as an independent item in their PRSPs. The rest of the countries have not included ICT as an independent strategic component. They mention telecommunications sector development as an important factor for rural/agricultural development or as one of the components of the infrastructure for economic growth. Four countries (Niger, Tanzania, Uganda and Yemen) do not mention ICT in their PRSPs (OECD, 2003).

In pursuit of these objectives, UNIDO has commissioned this report to explore the use of ICTs for the promotion of MSME development. The report provides practical guidance to UNIDO for the future development of projects involving ICT and MSMEs. The paper presents a framework for understanding ICT roles across a range of micro, small and medium-scale enterprise applications.

Section 2 of this report outlines the role of MSMEs in poverty reduction providing both a livelihood and a growth perspective. In each case the requirements for information and communication are surveyed as a precursor to understanding the role of ICT. Section 3 forms the bulk of the report and presents a detailed outline of the roles that ICT can play in supporting MSMEs within a livelihood and a growth perspective. The chapter suggests a value chain model as a suitable framework within which ICT applications for MSMEs can be understood. Chapter 4 outlines a comprehensive set of intervention priorities for donors, national policy makers and other support agencies that are seeking to intervene to support MSMEs through ICT. Chapter 5 presents a prioritised action plan that summarises the key areas of policy and support that should be considered by developing country governments, international donors and other intervening agencies.

The report is the product of the desk study prescribed by the terms of reference. The principal means of collecting information for the study has been through conventional literature review and by drawing on a number of research projects conducted by the Development Informatics Research Group at IDPM, as well as from associated research.

The report will be presented at a panel at the World Summit on the Information Society (WSIS) workshop in Tunis, 16-18 November 2005.

2. Role of MSMEs in Poverty Reduction

A distinction is drawn in the literature between enterprises that support livelihoods (predominantly micro and informal) and enterprises that have grown or which have growth potential (predominantly small and medium, and formal) (Shaw, 2004; Duncombe & Heeks, 2002).

Two different types of enterprises can be categorised:

- Livelihood enterprises – for the majority of the poor, delivering benefits in terms of livelihood assets.
- Growth enterprises – that show a greater business focus and which deliver broader/longer-term benefits of competitiveness, innovation, exports, etc.

-*Livelihood enterprises* form the majority in both rural and urban-areas of developing countries. In rural areas, micro-enterprises are largely founded on the direct sale, trading or processing of natural resource (agricultural, horticultural, forestry) inputs, as well as lower skilled occupations such as fishing, household cultivation, simple brick making, rock breaking, etc (Liedholm & Mead, 1999). In urban areas livelihood enterprises are predominantly informal and service-based.

-*Growth enterprises* encompass more diversified activities. In rural areas these include small-scale manufacturing and the provision of rural services and trade (Shepherd, 1998). Typical entrepreneurial occupations are based around agricultural production (e.g., poultry rearing, processing and packaging of food stuffs); personal services (e.g., hairdressing, food preparation, retailing); and skilled trades (e.g., textiles; carpentry, metalwork, motor mechanics). However, most such 'growth enterprises' are concentrated in urban areas, and are active in a broad range of sectors covering manufacturing, services (including ICT services) and trade.

2.1 Livelihood Enterprises

Poor households will likely step in and out of micro-enterprise activity depending upon the nature of the activity, seasonal demand, the availability of resources or other personal and social factors (Ellis, 2000; Shepherd, 1998). Studies from Malawi (Orr & Mwale, 2001), Sri-Lanka (Shaw, 2004) and Uganda (Ellis & Bahiigwa, 2003) confirm that the proportion of earnings from rural micro-enterprise are non-existent or very low for those in extreme poverty, but tend to increase in a fairly uniform manner for those who are less poor or non-poor. For most rural households micro-enterprise is a supplementary activity, with the largest proportion of household income still gained from a wider portfolio of traditional sources – primarily, wage labour, crop sales, livestock sales, transfers via social programmes or remittances from relatives residing in urban areas.

The poverty reduction potential of 'livelihood enterprises' is large, as enterprise income may become part of general household funds and be used for both day to day expenditure and 'lumpy' investments in human capital (school fees and health care charges) and other substantial expenditure items (e.g., weddings, school uniforms). Amongst women enterprise owners particularly, a proportion of income may go into improving household well being rather than being immediately reinvested in the enterprise. Income from one enterprise may be used for other household enterprises, as the household spreads risk, maximises opportunities and copes with changing enterprise performance. Enterprise revenues may also be used to maintain social and political capital (through informal transfers) and to invest in physical assets (e.g., home improvements, land purchases, transport, etc).

Exogenous and endogenous shocks may make the livelihood enterprise vulnerable. Equally there are likely to be periods when household expenditure is high, and little income from the enterprise is available for re-investment until reserves of working capital are built up once more. Nevertheless, any improvement that these enterprises can bring to their business activities is likely to have a direct correlation with well being in the family of the enterprise owner, and quite possibly of the extended family.

2.11 Livelihood Enterprise Information & Communication Needs

It has been noted that livelihood enterprises depend primarily upon informal and social networks to provide the information they need for enterprise operations (Duncombe & Heeks, 2002; Barr, 1998). However, the information reaching such enterprises through these channels can be unreliable because of inaccuracy, though trust is a major factor in their reliance on informal networks. Timeliness of information is, however, the most prevalent failure of the information delivery system currently used by livelihood enterprises, and a significant aspect of their vulnerability to exogenous change. The quantity and range of information received through traditional channels is also an issue, with barriers, such as literacy, language and social structures to be overcome.

Intermediaries (e.g., MFIs) within the networks used by livelihood enterprises are often not geared to processing information specifically for enterprises, but provide information in the course of delivering other services or products. The provision of information on a commercial basis to MSMEs is not practised on any scale in low-income countries. The retailing of information is far from common, and enterprises are often not accustomed to paying specifically for information. Some success has been seen where enterprise associations or federations have become information providers.

Few livelihood enterprises have direct access to digital ICT. Livelihood enterprises may possess a radio, and a very small minority may have a telephone. Access to telephones and electrical ICT varies, depending on the remoteness of the enterprise and the infrastructure of their area. Indirect or intermediated access to ICT may be more common. There may be shops or post offices where telephones can be used, and if the infrastructure is developed some shops may provide Internet access. These shops, and some support service organisations (MFIs and BDS providers), increasingly also provide other office services (e.g., photocopying), and possibly email accounts.

2.2 Growth Enterprises

Growth enterprises are an important source of relatively secure employment – yielding far higher incomes. However, it is estimated that only 1% of enterprises in sub-Saharan Africa that start out very small (proprietor-only businesses) succeed in expanding to employ 10 or more workers (Liedholm and Mead, 1999). This category of enterprise, however, forms an important stimulus for formal sector growth and trade.

These enterprises tend to be more market orientated, often having identified niche products or services leading to profitable and sustainable market opportunities. Evidence shows a uniformity of characteristics of such enterprises. They are likely to offer full-time employment for proprietors and less likely to be providing supplementary income. They are very likely to have been started by someone with previous work experience, such as by a previous paid employee, rather than by someone who was unemployed or who had moved out of agriculture. Growth

orientated enterprises are twice as likely to be manufacturers than traders. In most developing countries, they are far more likely to be run by male entrepreneurs than female, and are predominantly urban-based.[2]

Growth orientated enterprises in urban areas (the majority) benefit from a higher degree of integration into market systems, which are more highly developed and in closer proximity. As enterprises grow, they are likely to develop more sophisticated market linkages for the supply of business inputs and for the marketing and sale of outputs. Evidence shows that growth orientated enterprises are more likely to sell larger quantities (of goods or services) to market intermediaries such as retailers, wholesalers, other enterprises and institutions (such as government). Micro-enterprises that do not grow, however, remain dependent on selling small quantities to individual customers (King and McGrath, 1999; Liedholm and Mead, 1999).

Enterprise growth is likely to bring a higher degree of specialisation in the production of goods or services. Larger enterprises are more likely to externally source processed and semi-processed material inputs as well as other business services. More sophisticated procurement of inputs and greater market opportunities also give rise to increased levels of risk and a greater need for trust in the market place.

> " Enterprises that move towards a more specialised mode of operation are open to a new set of risks not borne by those who operate in a more vertically integrated fashion. Such producers must rely on other participants in the market to supply them with required inputs in a manner that is reliable in terms of quantities, qualities, timing and price. On the output side, again, they must trust buyers to take delivery of their products and pay reasonable prices for them in a timely manner."
> (Liedholm and Mead, 1999, p54)

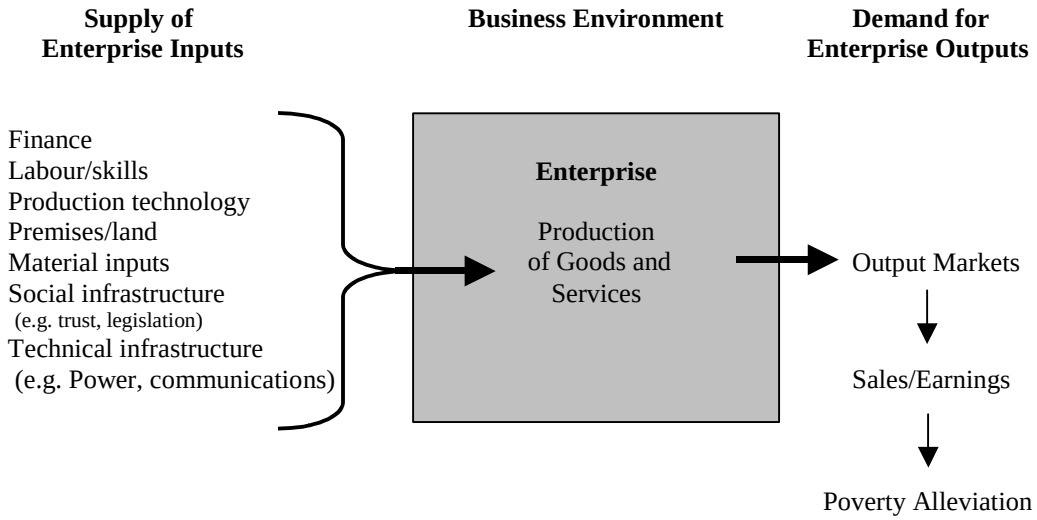
2.21. Growth Enterprise information & Communication Needs

Growth, above all else, requires an increased ability to interact with other market actors and institutions (Shaw, 2004). In this respect, enterprise growth requires significantly higher levels, and breadth, of managerial ability and interpersonal communication skills (Trulsson, 2001; Manu, 1999; Barr, 1998; Gibb and Davies, 1990). Growth enterprises will have a wider range of needs (including information needs) than livelihood enterprises. For example, studies show that micro-enterprises express needs primarily, and often exclusively, in terms of access to credit to fund recurrent expenditure for the everyday running of their businesses (Harper, 1984). Conversely, growth enterprises are more likely to have made provision for sustaining cash flow, and are likely to require larger sums of capital investment, and will have broader needs in relation to workforce training, market access, technology and management skills (Trulsson, 2001; Otero and Rhyne, 1999). In consequence their needs for information will reflect a greater degree of business maturity, and many such enterprises may already be ICT users.

[2] Enterprise growth has been achieved primarily in urban areas. Rural enterprise growth has been more prevalent were agricultural output has provided demand driven inputs into the micro-enterprise sector. There is a strong correlation, for example, between agricultural food production in Kenya and the growth of rural based enterprises. However, the growth of rural enterprise does not only depend on the availability of agricultural outputs. Botswana, for example, shows a rate of rural enterprise growth only 4.6 percentage points behind that of urban in the early 1990s, whilst agricultural output accounted for only 5% of GNP, and the rate of growth of food production had been consistently negative. In this case, however, strong macro-economic performance in other economic sectors, combined with a high level of government transfers, was providing a stimulus for rural enterprise growth. The success of rural enterprise is also dependent on the availability of labour and the existence of transport and communication links to connect with larger urban markets (Liedholm & Mead, 1999; Charmes, 1999).

Growth enterprises require information about four main aspects of their operations: supply, demand, the operating environment and internal processes (Duncombe & Heeks, 1999). At the level of the individual enterprise, this is illustrated in Fig 1.

Figure 1. Information Needs Analysis



Source: Duncombe & Heeks (1999)

In both the developed and the developing countries, business information for small enterprise is most likely to be communicated through informal networks or business relationships. Information via the latter is provided either free of charge or for a hidden or indirect fee, through forward and backward linkages to customers and suppliers (Duncombe and Heeks, 2001; Anderson, 2000). While the importance of social networks and family relationships in providing informal business information is emphasised in research findings, the ability to acquire market information has been shown to be a significant factor in the success of new enterprises.

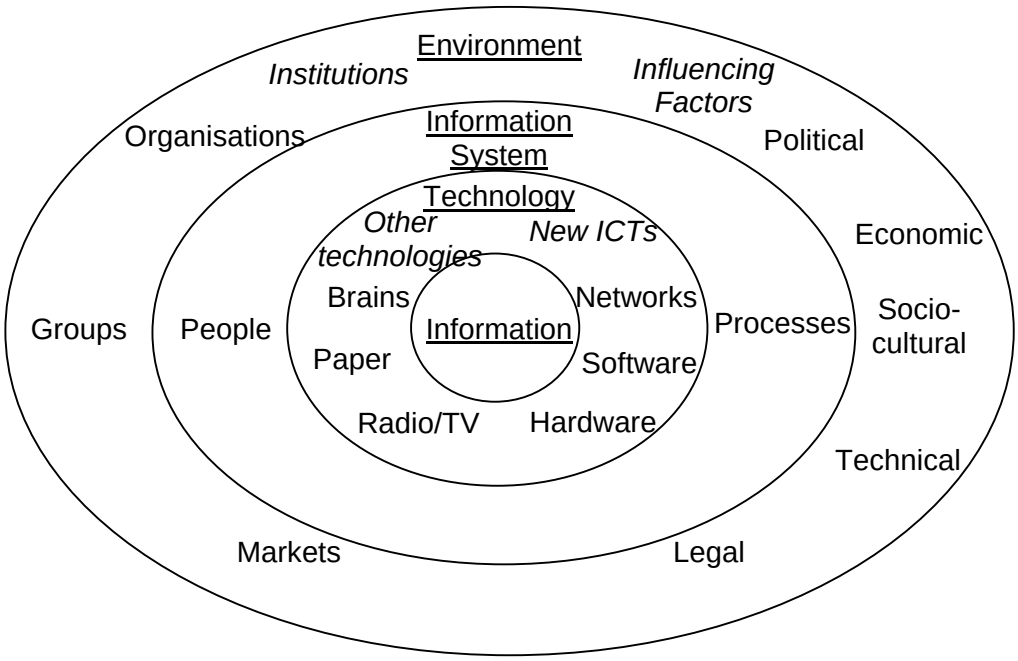
Micro-enterprises will tend to have smaller, narrower networks, which serve the functions of insurance and risk reduction at the same time as they provide business information. Known social and business contacts are trusted and regarded as sources of reliable information, reducing the perceived risk of acting upon it. At the same time, smaller networks limit the range and quantity of information available to the MSME operator. Lenders in informal credit markets can be worse off with information that is confined to small groups of personal acquaintances (Bose, 1998). Small and medium enterprises, on the other hand, have wider, more diverse networks, and are more pro-active in seeking out information (Barr, 1998).

3. Role of ICTs in Supporting MSMEs for Poverty Reduction

To gain an insight into the importance of use of ICT by MSMEs, it is first necessary to be clear about what is meant by 'ICT', and how the technology relates to the information systems and the 'core' productive systems used by MSMEs in the developing countries. For purposes of analysis, recognition must also be given to the differences between enterprises, outlined in the simple two-part categorisation described in the previous section (livelihood and growth enterprises).

Information and communication technology (ICT) can be defined as an electronic means of capturing, processing, storing, and communicating information (Duncombe & Heeks, 2002; Heeks, 1999). ICT is based on digital information such as contained in computer software and transmitted over communication networks such as the Internet. However, in much of the developing world, other pre-existing 'non-digital' media are far more widespread (Kenny, 2002). These include information held as electro-magnetic waves such as used in radio, television and pre-digital (analogue) telecommunication networks. They also include paper-based technologies based on information held as the written word such as used in books, manuals and newspapers; as well as information that is transmitted via oral means – and held in the human mind – what might be described as 'indigenous knowledge' (Davenport & Prusak, 1998). The use of ICTs for enterprise development must be considered in this context, illustrated in Figure 2 below.

Figure 2. Contextual Framework for ICT and MSME



(Source: Heeks 1999)

3.1 Application of Technologies

The promise of ICT to contribute to poverty reduction lies in its power to give poor women and men access to improved information and communications. ICT can remove the constraints to obtaining and communicating information, empowering enterprises and poor people in general. ICT, broadly, allows a reduction in transactions costs, improved communications with markets and within the supply chain, and improved information about new opportunities. More specifically, ICTs can:

- Provide reliable access to markets (local, regional and international) through increased use of affordable communications (mobile phones, fax, email).
- Improve contact with suppliers, and transport links to and from markets (e.g., through databases of enterprises, products, and suppliers).
- Inform choices, particularly regarding prices of raw materials and finished goods, enabling better prices for enterprises when dealing with traders.
- Provide information about locally and internationally available non-financial business development services (e.g., training schemes, business skills, and marketing).
- Provide direct or intermediated access to BDS (e.g., training packages, advice best practice).
- Provide access to legal information, including information on contract law, tax law, registration and regulation.
- Provide improved access to information about financial services, and access to financial services.

3.11 Appropriate Technologies for MSMEs

a) Radio

Radio is one of the most common of ICTs, with a high degree of ownership by low-income households in the developing countries. Radio is effective for dissemination of transmutable information (i.e., information that can be gathered from different sources and re-distributed widely). Examples included information about improving agricultural productivity through new methods, new technologies, improved seeds and livestock methods, as well as more general information concerning weather conditions or market opportunities. Grace, et.al (2004:18) observes that radio as a method of information delivery has several advantages:

> " firstly, both the radio unit and programming and delivery mechanisms are among the cheapest forms of mass media…. Secondly, radio signals can penetrate remote geographic regions, and any individual with access to a radio set can receive information, regardless of literacy or education level. Finally, rural radio provides region specific information, easily incorporates local concerns and feedback, and can operate in local languages"

Until other ICTs (e.g., computer-based technologies such as the Internet) can replicate these advantages at the same cost, then it is likely that radio will continue to be the most relevant technology for the rural poor. Technology has also developed which enables local radio stations to use ICT to access regional and global information and to develop and produce their own programmes easily and at low cost (McVay, 2002). However, there is mixed evidence concerning the usefulness of radio to the business sector. For example, a market information system established in Burkina Faso when markets were liberalised in 1992 disseminated by radio weekly cereal price information for the regional markets. The system was found not to have a significant influence on the integration of cereal markets (Bassolet and Lutz, 1999).

b) Telephones and faxes

Telephony is widely used, where available, to communicate with the different actors in the supply chain (customers and suppliers). Enterprises attempting to move into new markets, and those selling or procuring over distances need access to reliable and low cost telephone services, and other ICTs, in order to identify market niches, map out competitor behaviour, check price information, contact buyers or suppliers and arrange transport.

Since the advent of mobile networks there has been increased usage of telecommunications by the poor. A three-country study (Uganda, Ghana and Botswana) carried out by McKerney (2003) indicated high levels of telephony usage (both fixed line and mobile) in what were described as 'rural no-access' areas of developing countries (areas where predominantly poor people lived with no direct access to telecommunication services). The study points toward regular use of phones by 75% of the samples surveyed in these areas, with roughly uniform usage across the three countries. Large numbers of respondents indicated they were prepared to travel large distances in order to use telephone services, via a range of access methods including booths (public payphones), tele-shops, tele-centres and private (mobile and fixed) lines. The purpose of calls was recorded as predominantly to friends and family (70%), a large proportion of which concerned financial matters. Approximately 15% of respondents in all three countries indicated that they were using telephones for business purposes. Telephony has been found to be particularly important in relation to planning and facilitating remittances in the form of 'income transfers' from family members residing abroad or in urban areas, thus supporting diversified income streams.

c) Email

Where telephone services are reliable and access to computers is available, email is becoming popular, and in many cases (such as in the tourist sector and among importers/exporters) an essential tool for business communication. Email can be used to keep the supply chain informed (customers and suppliers) and for accessing new information, ideas and relevant organisations. Email also enables low-cost international communication, and does not require the simultaneous availability of both parties.

In order to benefit from the full capability of email, entrepreneurs require Internet access. In rural areas the means of access has been through telecentres or other such community-based access points. In urban areas most entrepreneurs have ready access to email via Internet cafes that are largely self-financing and sustainable and which, in many cases, are able to provide broadband access that would otherwise be unaffordable to most MSMEs.

d) Internet and e-commerce

Access to the Internet potentially allows access to new information, ideas and organisations, from regional and global Internet service providers, including accessing (at low cost) developed country information sources to assist with specific problems. The Internet can be used to market (advertise) goods and services. The Internet can also offer additional, value added services, including e-mail, information services and distance learning, increasing the effectiveness of BDS providers. Providers serving multiple client groups may be able to deliver ICT based services to micro-entrepreneurs, even where demand from this market segment is weak (Barton and Bear, 1999).

There is evidence of enhanced use of e-commerce by MSMEs in developing countries (Duncombe, et al, 2005; Wresch, 2003). E-commerce can enable small enterprises, or more commonly groups of enterprises, to access different, often regional or global markets for their products. However, many have found that such markets are not easy to break into. There needs to be sufficient organisational capacity to ensure that orders can be made, quality controlled, and payment delivered. Sector-based surveys indicate that use of ICT has enhanced existing business-to-business (B2B) trading relationships, with MSMEs using ICT to exchange information, to coordinate logistics and to improve communications via regional or global supply chains (Humphrey, et.al, 2003). There is also evidence of a growing number of MSMEs making use of web-based marketing techniques that are effective for targeting niche export markets, as well as the overseas diaspora community (Moodley et.al, 2003). However, growth of transactional e-commerce for MSMEs is confined predominantly to the industrialised countries, and the highly skewed distribution of growth in revenues from e-commerce also implies an unbalanced spread of benefits (UNCTAD, 2004)

3.2 Different ICT Roles for Different Enterprises

Four different ICT-related enterprise categories emerge from previous research studies (Duncombe & Heeks, 1999).

3.21 Non-ICT Users

Non-ICT users are all those enterprises presently unconnected to any form of telecommunications or ICT-based information network. This includes the vast majority of developing country MSMEs. Information needs of such enterprises are quite localised. They will be met more by informal, organic information systems than by formal, ICT-based systems. Information-poor entrepreneurs are likely to be assisted in the first instance by strategies that help to improve natural support networks rather than by a strategy of formalisation. These might include: a) strengthening of backward/forward business linkages; b) provision of better local market/demand information; and c) building of social capital through community networking, the development of personal communication skills, and support for more effective interpersonal networking.

3.22 Non-IT Users

These enterprises make no use of computers, but have access to – and make regular use of – telecommunication services (primarily telephone and fax). Lack of finance and lack of management/workforce skills are key business constraints for this enterprise group. Most could not afford to buy a personal computer and most would find it difficult to obtain commensurate benefits in the short-/medium-term. Non-IT users are more likely to benefit from improvements in their existing information practices using the information systems and technology to which they already have access. Improvements to enterprise capacities for information access, processing and dissemination can be achieved through integrated-approach training that covers, for instance: a) interpersonal communication skills; b) enhanced financial management skills to improve business efficiency; and c) sales and marketing techniques.

3.23 Non-networked ICT Users

Non-networked ICT users are 'first-footers' in small business computing: they have access to computers (either on their own business premises or through an Internet café/community access point), but levels of computer use are typically low. Non-networked ICT users frequently lack managerial capacities and they share many of the characteristics of non-IT users. The same preconditions for enhancing basic management and information skills would apply before investments in enhanced ICTs are considered. These enterprises will also benefit from improving their organic and paper-based information systems.

3.24 Networked ICT Users

These enterprises make considerable, networked use of ICTs: frequent use of email and the Web, and use of computers in applications such as accounting and customer invoicing systems. However, these enterprises have typically applied and adapted such systems on a largely ad hoc basis. In many cases, they lack the employee skills to effectively manage the systems that have been developed. In other cases, the development process may be deficient.

In developing countries most livelihood enterprises tend to be non-ICT or non-IT users, whilst most growth enterprises still fall into the non-networked category (although able to make use of Internet cafes/telecentres, etc). Only a relatively small minority of enterprises will be 'networked' ICT users. It is also the case that the majority of networked enterprises will not have the benefit of broadband connections unlike the majority of their counterparts in the developed countries.

The preceding sections have considered ICT as technologies that support information access, processing and communication. The following 'value chain' model incorporates these roles, but extends the role of ICT as a 'productive' force that can be harnessed by MSMEs in developing countries.

3.3 A Value Chain Model of ICT Application

When considering the potential application of ICT it is important to recognise that as well as being a means of transmitting information and recording knowledge, they can also be used to increase productivity or create new products and services. In conducting productive activities, MSMEs interact with a range of actors within their production or value chains, using a variety of means of communication.

> " The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use" (UNIDO, 2001, p28).

Four direct value chain roles of ICT can be defined for all MSMEs:

1. ***Value chain core:*** using ICTs for the core operations of the enterprise, as for IT sector enterprises.
2. ***Value chain boundaries:*** transactional application of ICTs used to interface with suppliers or customers; mainly seen in terms of e-commerce applications.
3. ***Value chain support:*** application of ICTs for access to information and decision-making relating to four main areas: a) supply information: e.g., getting data on finance, materials, skills, etc. b) demand information: e.g.,

getting data on markets. c) environmental information: e.g., about supporting regulations and institutions. d) internal information: e.g., about enterprise operations.

4. ***Networking support:*** use of ICTs in building networks and linkages to other stakeholders: business stakeholders, social stakeholders, political stakeholders: building various aspects of social capital [3].

Table 1. ICT applications in the value chain

	Value chain core	Value chain boundaries	Value chain support	Networking support
Livelihood Enterprise	Limited application (e.g., mobile phones).	Faster & more timely Communications. Lower transaction costs.	Access to BDS/information via infomediaries (e.g., telecentres, BICs, etc).	e-networking for enterprise support structures (e.g., MFIs). Building social capital. e-advocacy
Growth Enterprise	Production of computer hardware, telecommunications products. Software/digital products. ICT-based business services. ICT-based training. Productivity improvements and production control.	Facilitating and conducting transactions (e-commerce). e-marketing.	Information access via Internet/e-mail. Internal processing of information. Support for decision-making (e.g., e-appraisal).	e-networking for business support structures. Cluster development. e-advocacy

3.4 Livelihood and Growth Enterprises

Table 1 (above) summarises some key roles for ICT according to the value chain categorisation and their applicability to livelihood and growth enterprises. The following sections outline these roles in more detail.

3.41 Livelihood Enterprises

Of the four possible enterprise applications of ICTs identified in Table 1, livelihood enterprises are likely only to predominantly make use of ICT in value chain support – and principally as a means of exchanging information with buyers or suppliers in the supply chain. For the majority of livelihood enterprises this will mean accessing public ICT services, usually provided commercially. There are possibilities – although limited – for ICTs to be used as a 'core processing technology' – the much-documented Grameen Phone is a rare example.

Barriers to the use of ICTs by 'livelihood enterprises' include:

- Lack of literacy amongst enterprise operators (most of whom are women).
- Lack of English (e.g., the main source of information on the Internet is in English).
- The predominance of traditional oral cultures and social barriers to accessing ICT.

[3] Social capital describes the norms, the trust and the extended networks that underlie MSME economic activity. Social capital not only describes the infrastructure of social relations that serves to coordinate actions, but also the information that is transmitted between actors via their social networks. Thus, it follows, that those who are excluded from such networks are those that are less likely to participate in entrepreneurial-type activities. Conversely, evidence suggests those with the most up-to-date and accurate information will be more able to participate, and make better returns on such activities (Lyon, 1999; Daniels, 1999).

- Lack of familiarity and skills with computers, coupled with lack of awareness, by enterprises.
- Poor infrastructure in rural areas and the distance required to travel to access ICTs for enterprises.
- Some ICT links not reliable even when they are available, because of poorly maintained equipment or disrupted power supplies.
- No widespread use of ICTs in the MSME supply chain, i.e., by suppliers and customers, making actual use of ICT by enterprises difficult, which reduces the value of ICT use.
- Lack of funds for investment in ICTs (predominantly for access).

As most livelihood enterprises do not have direct access to ICTs, the main opportunities for ICT-oriented enterprise development initiatives will not be at the level of the enterprise. A more strategic or systemic approach at the community or sector level is required.

However, suppliers and markets are increasingly going to expect communications in the supply chain to be via ICT. The most common way of enabling access to ICT that would reach livelihood enterprises is through telecentres. Often telecentres are established as components in broader development projects, but where they are designed as stand alone programmes it is important to obtain high usage. This can be difficult to achieve as telecentres cannot be expected to be in great demand before they exist and have gained widespread support. They, therefore, must court the community at large and identify ways in which they might benefit from the facilities and services. If they are placed at focal points within the community, they hold potential to become a powerful engine for rural development, through which a large number of information services can be dispensed. These may include telephone, fax, local bulletin, documentation searches on demand, video libraries for entertainment and education, health and nutrition training, government services, market prices self-paced learning and more.

ICT interventions for livelihood enterprises should not be judged solely on monetary impact, as issues of governance, environmental sustainability and social benefits cannot be readily separated from enhancements to their communication and information systems for enterprise purposes.

3.42 Growth Enterprises

Little is known about growth enterprises in developing countries – the jobs and income they create, the linkages back to poorer social groups, the role of education and training in their growth, and their capacity to link forward to the formal (corporate and large-scale) economy, both domestically and internationally. Local MSME contribution to this sector is further ahead in some countries than others, although all – even the poorest – show some ICT-sector activity.

Research suggests that ICTs are of most direct value to growth enterprises (Duncombe and Heeks, 2001; Miehlbradt, 1999). They are better placed than others to make use of ICTs, and they provide a greater capacity to generate wealth, employment, exports, innovation and to build a wider range of local and external business linkages. As direct ICT users such enterprises have already crossed the *'ICT threshold'*. They have overcome the (financial) barriers to entry, and the total costs of ICT ownership. The emphasis within the growth enterprises component of this study is therefore on areas of direct ICT application, predominantly for formal sector enterprises. The focus, therefore, is on those enterprises that already have access to ICTs or have the potential for direct access and application.

This section considers four functional 'action areas' for ICTs and growth enterprises:

1. ICTs as an enterprise output
2. ICTs as a primary, processing technology
3. ICT-related support activities
4. ICTs as a secondary processing technology

The first three of these categories encompass 'value chain core' activities and are concerned with the *production* of ICT goods and services. The fourth category encompasses 'value chain boundaries' and includes all other MSME sectors that are ICT *consumers.* Typically, in developing countries, these would be predominantly in the service sector – including financial, business, and technical services, the tourist sector, but also importers/exporters.

ICT as enterprise output

a) Manufacturing computer hardware and telecommunications products

Larger and more technologically developed countries (ICT-adopters) have achieved considerable success in ICT production and show further opportunities for expansion (India, Brazil, Indonesia, South Africa, Mexico and Egypt fall into this category, as well as Malaysia, Singapore, Thailand, South Korea and Taiwan). It is apparent that India is now seeing the benefits of such high levels of technological investment in terms of increased productivity and through the creation of new 'information-based' industries and services.

There are thought to be few advantages for latecomer countries to develop large-scale indigenous ICT production, which requires large capital investments and specialised skills (Kraemer and Dedrick, 1994). There are, however, opportunities for MSMEs in small-scale assembly (of PCs, for example), adaptation of hardware and in the production of ancillary components. There will also be opportunities for exports from smaller countries in areas of comparative advantage – and where the necessary skills, trade policies and infrastructure are in place (ILO, 2001).

b) Producing software

MSMEs offer considerable scope as software producers. Lessons from India show that small-scale software producers have succeeded by forging forward linkages to larger local software enterprises, through clustering, by focusing on the local market and through long-term support within a defined national strategy (Kumar, 2000; Heeks, 1999a).

ICT as primary processing technology

a) Digital products and software customisation

Evidence shows that enterprises that build information systems themselves and customised software internally tend to be more successful. However, specialised local support is also needed, mainly around customised software production, systems integration, and hardware installation/ maintenance.

b) ICT-based services

ICT-based services, including data entry, Internet service provision (ISP), web design and other services, are growing rapidly in all developing countries. MSMEs are central to providing these services to the wider economy. They would also include providers of telecommunications value-added services. This area offers considerable scope for MSME growth based on local markets, as well as the export of new services – e.g., MSMEs offering 'off-shore data processing' and 'back-office' functions. One example is the Kudumbashree initiative in India's Kerala state, which

has created 80 women's micro-enterprises undertaking data entry work (Arun et al, 2004).

c) Other ICT-related business services
ICTs will also form a central component of local business support services, including for example secretarial and word-processing services, desk-top publishing (DTP), media and advertising, distance learning providers, and design services including computer aided design (CAD). Phone shops are at the lower end of this kind of service provision. Integrating ICTs more effectively into these core business services and providing an environment that enables them to develop will be critical to the competitiveness of the private sector, as well as the effectiveness of NGOs and government organisations.

ICT-related support activities
a) Training and support
Alongside MSME activities in which ICTs are central as an output or processing technology, there are a growing range of opportunities for enterprise in areas related to ICTs. Some activities – such as ICT consulting and hardware maintenance – are likely to remain a relatively small niche because of high skill requirements. However, there are growing MSME opportunities in the sales of ICTs and ICT-related items such as consumables (paper, inks, CD/DVD, etc.). Opportunities in IT training also appear strong. The Kudumbashree initiative, previously mentioned, has enabled more than 1,000 women from poor communities to set up IT training microenterprises serving local school and community clients (Arun et al, 2004). There are also opportunities to support in-house training (for customisation of software, for example) via private sector MSME providers.

ICT as secondary processing technology
a) Business communication
In most countries, including those in the North, ICT is still most effectively used by the majority of MSMEs (both growth and livelihood enterprises) as a communication tool – to aid person to person communications and networking – through basic telecommunication services/ fax/ mobile/ email. 'Growth enterprises', however, make greater use of ICT (Internet/ fax/ telecommunications) for information access.

The extent to which core business information can be effectively transmitted via computer-based ICTs (via email, Internet and CD-ROM, for example) is in doubt (Chua 1999). Evidence from the Philippines suggests that Internet-based information services might play a greater role in making available business support services through local intermediaries and from official sources (Miehlbradt 1999).

The impact of the Internet for accessing market information, amongst 'growth enterprises' in developing countries, varies considerably between sectors. Exporter/importers (including the tourist sector) are the primary users. Most MSMEs serve local markets, and will only derive benefit from net-based market information *if* (in low income countries) and *when* (in higher-income countries) sufficient web-based data (local content) becomes available through local networks. However, there is little digitised content in most developing countries from local institutional (primarily government) or private sector sources. For MSMEs that trade across borders (importers, exporters and the tourist sector) the Internet is now a critical tool for accessing business information from external institutions and global business networks.

b) Conducting transactions (e-commerce)
For importers – and especially – exporters, there will be growing pressures to move into e-commerce because of the way that it reduces financial and time costs, and improves transaction certainty and record keeping. There are four specific channels through which e-commerce can impact on enterprises in developing countries (UNCTAD, 2004; OECD, 2000a).

- Making it easier for local producer groups (e.g., artisans) and MSMEs to access business-to-consumer (B2C) world markets.
- Stimulating global markets to draw upon agricultural and tropical products from developing countries.
- Allowing MSMEs in the developing countries to tap into the business-to-business (B2B) and business-to-government (B2G) supply chains.
- Encouraging small-scale service-sector providers in developing countries to link more effectively into world markets.

At the moment direct B2C e-commerce case studies provide the most concrete examples of direct benefits to MSMEs. The other avenues mentioned also hold considerable promise, although in some cases, investment costs associated with e-commerce may outweigh benefits for MSMEs (Bhatnagar, 1997).

c) Data processing
Internal data processing (business accounts, inventory, payroll, invoicing, etc) is an important area for many growth enterprises, particularly as they grow and particularly with regard to controlling enterprise finances and cash flow. 'Off-the-shelf' packages such as 'Quickbooks' are in wide spread use in developing countries, however they are sometimes inappropriate for individual business needs, and require customisation. Sector focused training or training links with suppliers will be the main requirement for successful implementation of such internal information management systems.

d) Production control
A number of countries have been able to develop successful strategies for computer-based indigenous production technologies (OECD 1995). They include: Brazil, India, Egypt, Malaysia, Philippines, Korea and others. More sophisticated ICT-based technologies such as Flexible Manufacturing Systems (FMS) and Computer Integrated Manufacturing (CIM) have become increasingly important for larger countries such as India where there is a large, local, computerised machine tool industry. Case studies suggest that the process of technology transfer is facilitated primarily through linkages to large firms – either local or inward investors.

Clearly, the ability of MSMEs to adopt ICT-based production systems (ranging from Computer Numerically controlled (CNC) to flexible manufacturing systems (FMS)) will vary country by country. In countries where large-scale manufacturers have already adopted such technologies, the conditions may be favourable to transfer technological know-how into the small and medium-scale sector through collaborative, licensing and sub-contracting arrangements. In fact, in some countries this process of technological diffusion is already taking place. However, there is little prospect of manufacturing MSMEs in low-income countries developing ICT-based productive capacity until ICT-diffusion has progressed in the large-firm sector, until local factor endowments are conducive to such investment and without encouragement through the wider institutional framework.

3.43 Support for Growth Enterprises

The analysis points to three possible areas of support for 'growth enterprises':

- More effective communications for the wider enterprise sector.
- Facilitating effective use of computer-based information systems within enterprises, through private sector provision and encouraging collaborative arrangements.
- Technical support – through institutional sources – might play an increased role in this area, but technology transfer will be most effectively managed through market-based intermediaries. In low-income countries, however, indigenous technological capability to adopt ICT-based production systems is not yet established (either because such large-scale industries don't exist or because of continued comparative advantage gained through labour-intensive production).

At present, the local ICT-industry (products and services) in most low-income countries is dominated by the subsidiaries of large multi-national computer/ consultancy companies. Development of nascent locally-owned ICT-enterprises (i.e., the local ICT sector) should be promoted for the following reasons:

- They contribute to building local ICT industry capacity and building a skills-base.
- They substitute for (expensive) imported ICT goods (but particularly) services.
- They stimulate local economic development and provide the information and management tools for the wider business sector.
- They provide local ICT applications capacity that NGOs, and other providers of welfare services, can draw upon.
- They can help more traditional industries (such as artisans or foodstuffs producer groups) connect to regional/global markets via ICT-assisted (fair) trade.

3.5 Conclusions

ICT applications will be found across the whole MSME sector. Evidence suggests, however, that service-based enterprises (business, financial, technical) and importers/exporters (tourist sector, manufacturing and services) as well as the IT sector itself will reap most benefit from ICT, and will be in a better position to transmit benefits to the wider community.

Research suggests that diffusion of ICT must achieve a *critical mass* in terms of coverage, organisational adaptation and learning by doing before widespread productivity or efficiency gains become observable in the wider economy. In most developing countries, achieving any form of *critical mass* will be a long-term process. It requires economy-wide redesigning of business processes and the development of new business and organisational cultures, which in turn requires changes in systems, procedures, skills and attitudes (Hanna, Guy and Arnold 1996; Moussa and Scwhare 1992). The 'growth enterprises' sector will play a critical role in stimulating these developments and increasing the volume of ICT critical mass. Focusing on ICT production will emphasise organic growth – encouraging a step-by-step approach to building local capacity, at least, partially serving the needs of ICT consumers.

Constraints to increased ICT use are considerable. Developing countries lack physical infrastructure and affordable access; technology education and extension

institutions are weak; local supply capabilities and access to international know-how are restricted; and domestic demand is low due to underdeveloped public sector services and a lack of medium-scale and large-scale firms driving ICT innovation. All these constraints, and more, mean that ICT diffusion into the MSME sector is low.

The ability of enterprises to access ICT applications (such as e-commerce) depends primarily on the level of telephone 'fixed line' infrastructure development. Larger countries (principally India and China) have an in-built advantage because of their size and level of indigenous technological capability. Affordability and total costs of computer ownership remain the critical ICT access issues – particularly for potential growth enterprises. Market liberalisation and competition are, over the long term, expected to lead to lower prices for universal business access across all developing countries.

Computer based systems require higher levels of education and literacy, and specific user skills. Consideration of user skills, however, does not take into account the wider range of facilitating skills (Mansell and Wehn, 1998) that are required for the design, installation and maintenance of equipment, such as telecommunications infrastructure, ISPs and computer networks, for example. It is in the area of industry skills, however, that ICT-growth enterprises can make their most significant contribution.

Other barriers (particularly to e-commerce) relate to the local business climate – the readiness of local MSME sectors to enter such markets and the level of leadership within the local business community. The ability of enterprises, individually or collectively, to enter electronic markets will also depend on the wider ability of the local market to support such transactions – by providing effective logistics, certification and contractual services, a secure environment (including data protection and payment security) for e-transactions. Additionally, the trade and regulatory environment will also need to be in place, which will require developing country governments to act in such areas as tax, trade legislation, investment policy, intellectual property and ICT standards.

Next, in section 4, the issues and models discussed in this section will be considered in relation to priorities for action.

4. Priorities

4.1 Which Enterprises?

What Type of enterprises should be supported through intervention involving ICT?

4.11 Livelihood vs. Growth?

There are arguments for and against each type since there is a tension between 'greatest need' vs. 'greatest effect' (i.e., livelihood enterprises represent greatest need for intervention, but ICT-related (and other) interventions have greatest effect on growth enterprises). Whatever the conclusions, recognise that "one size does not fit all" and targeted strategies are required because of the different roles ICT play in the different enterprise types.

- *Livelihood Enterprises:* for these, information is not that critical an issue; there are greater constraints that relate to markets, money, skills and motivation. They have the least capacity to meet information needs, and want to rely most heavily on enterprise support agencies to meet those needs. They need help building informal linkages. ICT are of limited value.
- *Growth enterprises:* for these enterprises, information moves up the priority list but they have a greater capacity to meet their information needs. They need help building business linkages. ICT can be of quite significant value and these enterprises should be the priority focus for ICT interventions: they are better placed than others to make use of ICT, and they provide a greater capacity to generate wealth, employment, exports and innovations.

4.12 ICT vs. Non-ICT User Categories?

'One size does not fit all'. Different interventions will be required by different ICT-related categories of small enterprise (refer back to Section 3.2).

a) Non-ICT Users: Other Technologies First, Then ICT Intermediaries

The main technology-related priority for this group will be access to telephone services. This is the information-related technology that has done most to reduce costs, increase income and reduce uncertainty/risk. Other pre-existing information-handling technologies (literate and organic) should also be addressed for this group.

Where ICTs are used, they should provide a supplement, not a substitute, for existing information systems. In most cases intermediaries (and subsidised access) will be needed to bridge the financial, socio-cultural, and knowledge gaps experienced by current non-ICT users. Priorities for application of such intermediated access to ICTs probably lie in communication more than in processing of information. The formal information processing requirements of such enterprises are relatively limited, and can typically be met cost-effectively by improved paper-based methods.

b) Non IT Users: ICT Intermediaries and Better Information Practices

Within such enterprises, it is only when basic skills and/or financial stability have been significantly improved that any true benefit is likely to be gained from applying ICTs. Of course, like the non-ICT users, they would find value in mediated access to ICTs. Again, communication is likely to be a priority for both receipt (e.g., market prices) and dissemination (e.g., product/service details) of information. Again, there are dangers in failing to recognise that the objectives of 'enterprise' for some in this category relate more to social purposes and to reduction of vulnerabilities than to developed country models of risk-taking and entrepreneurship.

c) Non-networked ICT Users: Rounded Support for ICTs
There are greater ICT-related pressures within this group than felt in the previous two categories: a) enterprises may require specific ICT support, as in the printing and publishing sector or tourism sectors, where competitive pressures driven by rapid technological change mean enterprises must 'adapt or die' in relation to utilisation of new technology; b) enterprises may need to expand their use of ICTs in order to achieve compatibility with customers or suppliers; c) enterprises may feel pressurised to adopt ICTs to keep up with competitors and to create an image of modernity.

However, there are high failure rates in the use of ICTs for this group. These can be addressed by incorporating both ICT use and design skills into training, technical assistance initiatives or business support packages. Entrepreneurs must be assisted to think not just about the immediate installation of information systems, but also about their sustainability. Entrepreneurs need to understand that their information systems will only continue to operate if they have a continuing supply of finance, skills, knowledge, spares and consumables.

d) Networked ICT Users: Prioritise for Assistance with ICTs
Overall, such enterprises will benefit from a more strategic approach to managing information. This will help them evaluate the costs and benefits associated with improving both ICT-based and non-electronic systems. They also require complementary inputs to support their current systems. For example, a better understanding of marketing and promotion as a precursor to making more effective use of the Internet.

Better or best practice needs to be disseminated about the development and management of computerised information systems. They will thus benefit from the training and sustainability considerations identified for non-networked ICT users. Given that many enterprises in this category have overcome key business constraints and that some demonstrate clear growth potential, they should be prioritised for ICT-related interventions.

We have differentiated enterprises according to technology-related categories. We could also differentiate according to:

- Traditional vs. IT sector – traditional enterprise is more poverty-focused but IT sector enterprises show a much clearer relation between ICTs and development. A focus on each sector would need quite different intervention approaches;
- Generic vs. women's – this raises arguments for and against specific targeting of women-run enterprises with ICT-related interventions;
- Size vs. sector – there is evidence here in favour of abandoning size-focused support for enterprise and, instead, use ICT-related interventions to support particular sectors – encouraging ICT support for greater sector-based value chain integration.

4.2 What Interventions?

4.21 Supply-Focused or Demand-Focused?

- Supply-side interventions: e.g., training, finance, providing equipment.
- Demand-side interventions: e.g., development of linkages to customers (e.g., sub-contracting to local large customers; export support to link to overseas customers); other marketing support.

There are arguments that there should be more focus on demand and less on supply e.g., in value chain support, enterprises need more help getting information on demand and on customers (too much focus on supply-related information at present); e.g., at value chain boundaries, e-business activity needs to stay customer – rather than supplier-focused.

Some more general points can also be made: a) enterprises need other interventions to focus more on demand (too much focus on supply at present – training, finance, technology etc.); b) in putting ICTs into enterprises there needs to be greater thought given to the drivers that will make enterprises demand ICTs (at present there is too much focus on enablers that help enterprises overcome supply barriers to ICTs).

4.3 Levels of Intervention?

Interventions can be considered under macro and meso/micro headings.

4.31 Macro/national level

Policy and infrastructure development (technological, educational, legal and institutional).

The successful adoption and effective use of ICTs by either 'growth' or 'livelihood' enterprises is crucially dependent on the environment in which they are operating. The generally limited resources of MSMEs in developing countries mean that they are more dependent on the external environment for information and communication services than large-scale enterprise. In particular, the effective use of new ICTs for small enterprise development is significantly affected by the constraints and shortcomings present in the policy, institutional and market environment.

There is broad agreement between different studies on the critical factors for an enabling environment for ICTs and enterprise development (Molla, 2004; Bridges, 2003; Esselaar and Millar, 2002; McConnell International, 2000; Saenz, 2000). For the purposes of this study, four key aspects of the external environment for MSMEs are highlighted: a) the policy and regulatory framework; b) the telecommunications (and other) infrastructure; c) the ICT sector itself, and, d) the promotion and awareness of ICTs and e-commerce.

Policy/Regulatory framework

The principal elements of the policy/ regulatory environment for ICTs and enterprise development are: a) the overall national strategy for ICT development; b) the policy environment for telecommunications; and c) the policy environment for e-commerce. These three aspects of the policy framework are inter-related, and their effectiveness can be dependent on other regulations governing financial and tax matters.

National ICTs strategy

In most developing countries there is little recognition of the strategic importance of new (digital) ICTs in national development. The role for a national information/ knowledge/ technology policy is unseen, let alone its relevance to enterprise development policy. In addition, developing country governments are faced with making decisions in an ill-defined field that is changing continuously and rapidly, while they are short of the required ICT expertise.

Telecommunications

There is general consensus that a liberalised, competitive telecommunication sector is required to ensure low prices and efficient services. However, regulations and a

capacity to regulate the telecommunications sector are also required. From the point of view of small enterprise development, where access to ICTs is a key issue, these regulations need to provide for equitable (universal) access, geographically and socially. They should not favour any particular technology (e.g., landlines over cell phones) but rather should enable opportunities for diverse new technology applications to be exploited.

E-commerce

In response to the rapid development of e-commerce in the developed countries, new business models and practices are evolving which call for new laws and regulations. There continue to be gaps in the policy/ regulatory frameworks in Europe and North America, while in developing countries, where e-commerce is limited to a small minority of enterprises, in many countries there are large holes in the legal provisions.

The regulatory requirements for e-commerce are technically complex, and cover a wide range of issues. Of critical importance are:

- Standardisation and harmonisation of electronic messages and regulations on e-mail contents.
- Secure payment systems (data security, privacy, etc).
- International trade, intellectual property rights, patents, laws, etc.
- Effectiveness of the legal framework to address and prosecute computer crimes, authorize digital signatures, and enable public infrastructures and services.
- E-commerce policies, and rules for different economic sectors.

Infrastructure

While telecommunications policy is required to provide the framework in which the private sector provides communications services, there is also a need for the physical infrastructure to do this. In many developing countries the infrastructure is currently inadequate or, for many people inaccessible, for newer ICT applications.

For MSME development, telecommunications infrastructure is a strategic investment necessary for developing and maintaining competitive advantage in both local and international markets. Though the private sector should be encouraged to invest in upgrading telecommunications infrastructure (e.g., in the Internet backbone and greater bandwidth), this is beyond the means of the MSME sector.

Telecommunications infrastructure is not just a question of physical availability, as the infrastructure needs to be reliable, accessible and affordable. In many countries, individual connectivity will be the privilege of a relatively wealthy minority, and to ensure equitable access to ICTs, community or public access facilities will be required. The affordability of ICTs – phones, Internet, video – for the majority in developing countries can be achieved only through shared access.

There are several possible models of how services could be provided in this way. Collective access ICT facilities, specifically for MSMEs, is one of these (e.g., the tele-cottage model, or as a service provided by BDS organisations). However, in many cases the viability of such services may be more secure if the facilities are not exclusively for enterprise operations. Detailed information about experiences with alternative models is not readily available.

The telecommunications infrastructure needs to be complemented by electricity and transport infrastructure if the advantages of ICTs are to be fully felt. Reliable use of ICT is essential for enterprises to rely on them as a business tool (power outages, for

example, are a disincentive to adoption), and reliable transport services are required to enable goods contracted electronically to be moved.

ICT Sector

There is a need for IT and communications companies to provide affordable goods and services (e.g., PCs, software) to MSMEs. Other studies have highlighted that the limited diffusion of new ICTs in developing countries is itself an important factor constraining the development and adoption of ICT applications (McConnell International, 2000; UNIDO, 2000; Saenz, 2000). An enabling policy and regulatory environment that encourages and supports the development of the ICT sector is required.

A key factor will be the development of human resources. ICT expertise in developing countries is quite limited. Skills to make effective use of ICTs in MSMEs are required, as well as skills and knowledge to provide ICT-based services. A further, strategic, HR question is whether there is the culture or attitude for a more knowledge-based society, based on information sharing and cooperation.

The development of the HR capacity for widespread ICT use is a long-term objective for the education systems of developing country governments. This objective can be tackled at all levels – in primary, secondary and university systems. In the short-term, training for skills and efficiency in the use of ICTs is being provided by both the public and private sectors (the latter mainly in urban areas). ICTs could also be incorporated integrally into the training services provided to MSMEs.

Promotion of ICTs

National or sector 'e-leadership', to promote the adoption of newer ICTs has been seen by some as a key element of the enabling environment for ICTs. This calls for specific actions and practices, as well as policies (UNIDO, 2000). For instance, priority can be given by governments to promoting the development of an e-society at a national level, including the integration of government functions and services, as has been carried out in China, Malaysia, Pakistan and Mauritius (ILO, 2001). Partnerships between government and the private sector to improve e-readiness and awareness raising amongst the public are also elements of e-leadership.

Some governments have adopted strategies and taken actions to realise the much-talked of 'knowledge society' (e.g., Costa Rica, Andhra Pradesh, and Estonia). There is scope within the MSME sector for enterprise associations and other sector institutions to promote awareness of the potential of ICTs and of the challenges that the spread of e-commerce will bring.

Conclusions for Macro Level

Full participation in e-commerce and the widespread adoption of ICTs for enterprise operations will require expansion of the ICT infrastructure and other essential services (such as electronic banking), the development of a strong user base to make it easier for enterprises to enter into e-commerce, and support services for MSMEs, such as public access facilities (telecentres). In summary, the essential steps required to develop and promote ICTs amongst MSMEs are as follows (Saenz, 2000):

- Development of infrastructure and facilitation of access
- Government on-line
- Improve knowledge /awareness
- Support for the adoption of the technology by firms
- E-commerce

- ICT sector development.

Implementation of these steps arguably calls for international cooperation to be focused at a higher level than the enterprise, or even BDS provider. An objective of international organisations should be to support governments in developing countries to establish the business environment, the skills base, the infrastructure and support services to facilitate and encourage ICT use.

4.32 Meso/micro Level

Developing intermediaries/infomediaries (i.e., agencies) on the supply side and developing markets on the demand side.

Business Development Services (BDS)

There are two aspects to be considered with regard to these support services and ICT applications. On the one hand there is the use of ICTs by organisations providing these services - business development service (BDS) providers and financial institutions; and secondly there is the support such organisations provide to enable enterprises to make effective use of ICTs. In this section we focus on the former, but first a brief word on the latter.

Business Development Services (BDS) are conventionally defined as 'services that improve the performance of the enterprise, its access to markets, and its ability to compete' (World Bank, 2001). BDS includes training, consultancy and advisory services, marketing assistance, information, technology development and transfer, and business linkage promotion. ICT use in BDS has the potential for reducing information asymmetries faced by micro-entrepreneurs, and connecting MFI clients – commonly micro-entrepreneurs in the informal sector – with global markets, and formal sector suppliers and markets.

A distinction is sometimes made between 'operational' and 'strategic' business services. Operational services are those needed for day-to-day operations, such as information and communications, management of accounts and tax records, and compliance with labour laws and other regulations. Strategic services, on the other hand, are used by the enterprise to address medium- and long-term issues in order to improve the performance of the enterprise, its access to markets, and its ability to compete (World Bank, 2001). The provision of both types of service entails information and communication between BDS providers, client enterprises and (generally) third parties.

Business Information Services

The Committee of Donor Agencies guidelines of good practice in BDS (World Bank, 2001) concluded that MSMEs perform better in an information rich environment, which business information services contribute to. However, "market signals on business opportunities, customer trends methods of organization, etc, are not communicating themselves effectively to SMEs" (World Bank, 2001). Research from the Philippines has found that enterprises want good quality, processed information delivered in a format that takes account of their learning style (Chua 1999). Information services, in other words, need to be supply led, whichever ICT is used.

There is evidence that MSMEs will pay for the right kind of information – i.e., information that is immediately useful for their business and which appears to offer a real gain – there is also a likelihood that the market by itself will not ensure the

adequate and equitable supply of business information, particularly to micro-enterprises (Miehlbradt 1999).

One way to provide information services to MSMEs is to use ICTs to network the services that already exist, providing a single entry point and operating the network and the support services as an enterprise (UNIDO, 2004a). The InfoDes project in Peru (http://www.infodes.org.pe/), for instance, has established a consortium of information providing organisations – government, private and NGO – to supply information services through one network. In some cases, access to information provided by others is facilitated by links on business information websites, a growing number of which are maintained by BDS providers and enterprise associations. For example, SMENET in Vietnam (http://www.smenet.com.vn/)

Other BDS

As with business information services, experiences of using ICTs for the delivery of other kinds of BDS in the developing countries are relatively new and undocumented. While there is considerable activity and experience in the application of ICTs for distance learning, their use for enterprise development training appears limited.

One potential that ICTs does offer is for low-cost international business development services, with training or information provided to MSMEs from sources located in other countries. While there may be opportunities for scale economies (e.g., in developing content), there would also be risks in terms of the local relevance of content and trust in the value of the information. Moreover, enterprise-related services targeted at MSMEs (including information on micro-financial services) and made available using ICTs, whether located in BDS one-stop shops or telecentres, are likely to need intermediation by trained staff (UNIDO, 2004a).

Studies have shown the need for entrepreneurial information, packaged in simple ready-to-use formats and available in the local language (written, speech, or multimedia). The type of information required varies. Sector specific information is more valued by enterprises, but has a much smaller audience. Rapidly changing information is also more valuable than static information, and there is a demonstrated market for this. This information needs systems, personnel and cash for collating and distributing regularly, although it, along with more sector specific information stands more of a chance of being cost recoverable.

Micro-finance

'Information lies at the very heart of micro finance' (Mainhart, 1999:1) and large amounts of critical business data from basic client information to complex portfolio analysis statistics must be stored, manipulated and presented in order to make good management decisions (ibid).

A large number of micro finance institutions (MFIs) are not computerised, and some have only computerised part of their management information system (MIS)[4]. In a survey of the use of ICTs by micro finance institutions Ferrand and Havers (1999) found that only one in ten had completely computerised their operations. This is partly due to the capital and recurrent costs of the equipment itself, but MFIs are also concerned by likely time and staff training costs of converting from manual systems. There are other factors which inhibit the introduction of computer systems, including the lack of electricity connection (common in many parts of rural Sub-Saharan

[4] MFIs interested in investing in ICTs for management information systems may access reports by DataPro, GartnerGroup and the Patricia Seybold Group, market leaders in provision of this type of information (Mainhart, 1999:2). Mainhart's *Management Information System for Microfinance: An Evaluation Framework* is a useful guide for MFIs wishing for guidance through the process of selecting the appropriate mix of hard and software.

Africa), intermittent supply and dangerous power surges, inadequate telecommunications, and low bandwidth ISPs.

Nevertheless, ICTs are already commonly used by larger and more established microfinance institutions (MFIs) as part of their management information systems (MIS), thereby increasing the reliability and timeliness of portfolio analysis and client information while reducing staff time in generating such information. However, the MFI sector as a whole contains institutions with highly divergent levels of professional competence, capitalisation and ownership of capital assets, and access to internationally accepted good practice. The institutional and human resource capacity, internal management systems, ethos and levels of professional competence within institutions in the microfinance sector also cover a wide range. The MFI sector is one where the capacity to absorb or adopt new technologies and use them effectively is highly divergent.

A number of ICT-related innovations are already being used by microfinance institutions around the world including smart cards; palm pilots for client record keeping and in-the-field loan appraisals; ATM (auto teller) machines; credit scoring software; ICT supported impact assessment and management information systems and the development and updating of Credit Bureaux (which provide credit risk scores for potential clients, based on centralised databanks) (MicroFinance Network, 2001:7).

Sensitive training of both MFI staff and clients will be necessary during the introduction of new ICT related systems. There may be location specific socio-cultural barriers to ICT use, which need to be identified and compensated for, if the adoption of ICTs is to be accommodated into the MFI system.

Conclusions for Meso Level

In general, the most effective intermediaries for facilitation, rather than direct intervention, for MSME development will be commercial organisations, and/or those able to add value to MSME goods and services by providing other marketing chain resources. However, for low-income enterprise operators who will face market failures in the provision of ICT-based, and non-ICT-based, business development services, interventions to address such constraints will be required.

Private-sector business membership organisations should be considered as effective and sustainable information providers for both livelihood and growth enterprises. ICT-capacity should therefore be built within:

- *Trade associations* – representing national (small) business sectors (e.g., tourism, legal and accounting, manufacturing, etc).
- *Chambers of commerce* – representing the private sector within districts or regions.
- *Umbrella associations* – national associations dealing with government.
- *Employers associations* – organised at a national level.

Interventions should concentrate on support for facilitation, technical assistance and incentives to encourage competitive performance of new and existing BDS providers, innovations, and the development of appropriate service products. Lessons from case studies in the Philippines, for example, suggests that BDS providers should focus on market research; define services in term of benefits to customers; focus on areas of strength and not be too broad-based (Miehlbradt 1999). These types of interventions often require relatively less financial assistance, but a higher level of skill and market knowledge on the part of donors.

The ICT uses prioritised by different MFIs are likely to relate closely to the very different core objectives found within the sector (ranging from prioritising financial sustainability to tight targeting of the poorest and most excluded micro-entrepreneurs). The long-term goals set for enabling ICT development for large and well-established MFIs in countries like India or Bangladesh, for instance, will be substantially different to those possible for small MFIs in countries like Uganda. In India and Bangladesh constraints are likely to be centred on the low levels of literacy and English language competence amongst MFI clients, whereas in Uganda key constraints may be in the rural telecommunications and power sectors.

Agencies may find therefore that divergent objectives may be found within the MFI sector, and it is likely that agencies will wish to work with MFI umbrella organisations and networks, with ICT specialists and with country offices to develop strategies which identify the role of ICTs for MFIs. Similarly agencies may find it useful to facilitate institutional analysis and skills audits within MFIs. Following this, agencies may be able to usefully support existing MFI training and mentoring networks at the national and regional level to ensure that they are able to provide the needed capacity strengthening for MFI staff.

4.33 Overall Conclusions

There should be more focus on macro-level and less on micro-level intervention.

Enterprise support agencies spend too much of their time intervening with individual small enterprises. Although this can be valuable, more often such activity has been found:

- To be costly in terms of the high overheads of treating individual enterprises.
- To have limited reach (and thus be inequitable for those enterprises – typically the majority – which are not reached).
- To frequently fail to achieve the intended impacts.

Agencies should focus more on policy advocacy pressing for better policy-level interventions.

Two particular policy areas are important:

- ***National information infrastructure***: this will require policy components in four main areas. *Technical infrastructure* to increase the accessibility of ICTs, telephone, radio, TV and newspapers. *Skills infrastructure* to increase the extent of skills in literacy, information-handling, ICT use and ICT production. *Data infrastructure* to create more local Web content, to strengthen data production from statistical services and businesses, and to support more libraries and information centres. *Information resource infrastructure* to increase the extent of knowledge, motivation and empowerment.
- ***Overall demand***: this needs policies to increase the market/demand for enterprise outputs. Policy measures would include income redistribution, export promotion, and promotion of sub-contracting links between large and small enterprises.

4.4 How to Intervene?

4.41 Informal and Formal Information Systems

MSMEs mainly use *informal information*, typically self-generated or from family and friends. Informal information is essential to sustaining existing customers and to locating new customers. It is easier to use than formal information, more flexible, and richer in detail. Agencies must ensure they recognise this. However, they also need to recognise that informal information can be poor quality and restrictive, prompting bad decisions and stunting growth.

In order to develop, MSMEs must make a *transition* to a balance of informal and formal information. This enables them to access formal sources of inputs, to address more formal customer markets, and to manage the enterprise more effectively.

Agencies must be alert to those enterprises that need help making the transition. These will typically, although not exclusively, be small enterprises in the '10-20 employee' category. Transition help should:

- Stimulate the availability of formal data, e.g., by support for its production by national institutions.
- Help enterprises access formal data, e.g., through direct or intermediated use of ICTs.
- Help enterprises assess and apply formal data, e.g., by improving entrepreneur knowledge.
- Help enterprises act on formal information, e.g., by improving production capacities.

4.42 The Role of ICTs

Need to take a systemic approach to information and ICTs in MSMEs that is:

- An integrated approach (i.e., ICTs must be seen as a means to enterprise objectives, not an end in themselves);
- A holistic approach (i.e., one that does not just focus on delivery but on the questions of whether information can be accessed; be understood and applied; and, most important, be acted upon?).

A *holistic view* of means agencies using ICTs in enterprise support must ensure data delivered by ICTs can actually be used and acted upon. It means a multi-resource information package – not just ICTs alone – must be provided.

The *integrated* approach means agencies must: a) be information-centred, recognising that the value of ICTs comes from their new abilities to handle information; b) address the full range of technologies that handle information – not just digital ICTs but also intermediate (radio, TV, telephone), literate (books, newspapers, manuals) and organic (human-based) technologies; and c) understand the ‘context’ that shapes MSMEs and their information practices, including their use of ICTs.

Agency interventions must also be integrated: start with goals, then identify the information needs of those goals; then identify the role of information-handling technologies. Training, for example, must: a) take an enterprise development goal as the starting point; b) then work with trainees to understand how information helps meet that goal; and c) only then see where ICTs and other technologies can help handle the information. A training programme should be, for instance, ‘Better Marketing’ not ‘Using the Internet’. The same applies for other agency interventions.

Technical assistance should be, for instance, ‘to improve the enterprise's accounting systems’ not ‘to introduce computers’.

4.43 Inside-Out or Outside-In

Contrast the typical "inside-out" supply-driven nature of support for MSMEs with the better "outside-in" demand-driven approach for ICT-related interventions.

Enterprise-support agencies too easily fall into one of two traps:

- ***Being too top-down/supply-driven***: this means agencies plan what they *should* provide for enterprises on the basis of what they *can* provide. If the agency has strength in training, then it always sees training as a solution to enterprise problems, even when a different solution is needed.
- ***Being too bottom-up/demand-driven***: this means agencies plan what they *should* provide for enterprises on the basis of what enterprises *say they need*. This sort of participatory approach is valuable. But it is flawed. When asked what they need, entrepreneurs have a tendency to overemphasise finance and to under emphasise skills and demand, and a tendency to try to second-guess what agencies can supply.

A third ***‘needs-driven’*** viewpoint is required: an objective, third-party investigation of what enterprises actually need in order to survive or grow. A balanced approach to planning information/ICT (and other) interventions would therefore combine the three approaches emphasising: a) listening to entrepreneur demands and involving them; b) bringing in an independent understanding of needs to avoid distortions; c) making final choices within the constraints of what the agency can supply.

4.44 Who are the Infomediaries?

ICT intermediaries are organisations that own ICTs and that act as gatekeepers between non-ICT-owning small enterprises and the digital world of computers and the Internet. A number of issues arise about ICT intermediaries:

Who should the infomediaries be? They should be:

- Commercial ventures if possible;
- Able to add value to the information they provide by helping supply missing information chain resources where possible; and should
- In direct face-to-face contact with the enterprise for the 'last mile' of connectivity.

Enterprise suppliers can also be considered as infomediaries:

- They have the advantage of better 'fit' with enterprises since, unlike most enterprise support agencies, they are a business operating within the private sector.
- They are in a position to provide added value because they supply more than just information.
- They are connected to other business contacts.
- They have a clear and direct commercial incentive to ensure that the entrepreneur (as a customer) makes effective use of the information provided.

If enterprise support agencies are used, then – for stronger enterprises – private sector agencies are better. Where non-profit agencies are used as intermediaries, they should move towards more entrepreneurial processes, staffing and structure in order to emulate a more commercial mode of operations. For weaker/poorer enterprises, community-run/-owned intermediaries such as telecentre models will be better.

ICT intermediaries often struggle to sustain themselves. They face sustainability pressures:

- *Finance*. ICT intermediaries in developing countries suffer the twin problems of higher-than-average technology costs and lower-than-average income-generation opportunities.
- *Human capacities*. Installing and operating ICTs requires high-tech skills and knowledge. These are in short supply in developing countries – particularly outside urban centres – leading to significant downtime when technical problems arise. Non-profit ICT intermediaries often revolve around key individuals; as and when they move on, the intermediary may not sustain.
- *Technology*. Access to spares is far better in developing countries than it once was. However, for more remote intermediaries supply chain problems can again lead to significant downtime or closure.
- *Purpose*. Some donor-supported/non-profit ICT intermediaries are being set up on a wave of current hype and interest. As the wave moves on to the next development fad, sustainability of purpose may be lost.
- *Opportunity Cost*. Questions of opportunity cost must be put in perspective. Is it better to spend US$1 on an ICT intermediary or US$1 on digging a well. In many cases, money is not always fungible.

Nonetheless, donors and governments who fund ICT intermediaries at least must be aware that there may be other – even better – things to do with money invested in ICTs. This is particularly of issue in developing countries given higher technology cost/lower income and demand. It is also particularly of issue given the far greater penetration of radio, of television and of newspapers.

5. Summary Action Plan

When considering ICTs for enterprise development, it is important to emphasise that for the great majority of MSMEs in developing countries, ICTs are only a means to acquire and exchange information (i.e., as value chain support as defined in Section 3). The newer, digital ICT is only one tool, out of many, that enterprises (and support agencies) could use for communications and the management of information. The principal question for enterprise development practitioners and policy is, therefore, whether and how the information available and accessible to MSMEs is adequate for their needs, and how market failures contribute to low quality and quantity of information for MSMEs, and how ICTs can be used to redress this.

The assessment of options for supporting poverty-focused enterprise development, involving ICT applications, must be undertaken in a way that is integral to the strategy for enterprise development generally and integral to the general strategy for the development of information and communications systems. The greatest contributions from ICTs for enterprise development may be through the wider framework of telecommunications development or through ICT applications within wider enterprise development programmes. With this in mind the following prioritised action plan can be considered:

Prioritised Action Plan

a) Supporting the enabling environment for supply- and demand-related macro-level interventions, and adopting national strategies for ICT development.
b) Awareness raising among donor and enterprise support agency staff about the role of ICTs for productivity and competitiveness.
c) Development of demand-driven information services incorporating e-partnerships and development of local content with a sustainability requirement.
d) Development of an authoritative knowledge base of good practice on ICTs through support for networking, including e-networking with business partners.
e) Support the development of the ICT sector and ICT technical capability, and the localisation of IT sector support services.
f) Development of integrated e-business support and productivity enhancement packages for MSMEs through sector strategies and demonstrators, such through the use of as e-appraisal tools.

Areas of particular attention for ICT-related interventions for MSMEs will include:

a) The policy and regulatory environment, specifically to enable adoption of e-commerce

The policy and regulatory environment that affects the contribution of ICTs to enterprise development embraces telecommunications and broadcasting policy as well as enterprise development and commercial policy. There is a strong case for developing country governments to adopt national strategies for ICT development, in view of the cross-cutting nature of their development contribution.

b) S*upport for increasing awareness of ICTs, and their benefits and pitfalls, amongst policy makers, donors, BDS providers, enterprise associations and enterprises*

Awareness raising with policy makers, with donor staff and with enterprise support agencies of the contribution to poverty reduction that ICT-based enterprises (IBEs) are making, as well as the broader contributions to raising productivity and competitiveness of MSMEs. Awareness raising could also include development and pilot testing of e-commerce or e-business support packages for developing country MSMEs.

c) T*he development of content relevant to the information needs of MSMEs, including development of the institutional arrangements and mechanisms to maintain and update relevant content*

While access to ICTs can be provided through various models, there remains a need to address the lack of useful, relevant digitised content. Improving the availability of information about markets and the operating environment through ICTs requires a system to provide this. The commercial provision of this information (i.e., BIS) will focus on supplying enterprises that can already access markets effectively. This requires investment in the digitisation of information, making it accessible (through incorporating local languages) and ensuring that there is a system in place to maintain and update it. This could be done through existing BDS providers and/or enterprise associations.

*d) S*upport for an authoritative knowledge base of good practice on ICTs for MSMEs including support for networking using ICTs amongst BDS providers and MFIs to exchange good practice*

This will include knowledge-building to understand more about the contribution to poverty reduction and development that ICT-based enterprises (IBEs) are making in four main areas: jobs and growth; enterprise linkages/provision of goods and services; knowledge creation; and gender and environmental impacts. More effective networked communications for the wider enterprise sector should be the main focus. In the first instance, this means helping to forge more effective forward and backward market linkages, business networking and access to critical market information. If ICTs can contribute to these objectives, they should be supported – through telecommunications access/ local networks (LANs)/ Internet/ email/ mobile.

e) Support for the development of the ICT sector and ICT technical capability

At present, the local ICT-industry (products and services) in most low-income developing countries is dominated by the subsidiaries of large multi-national computer/ consultancy companies. Support for nascent locally-owned ICT-enterprises (i.e., the local ICT sector) should be supported. Individual enterprises will be most effectively assisted through facilitating private sector provision and encouraging collaborative arrangements – within enterprise clusters, for example – overseen by sector-led business associations, suppliers and other market intermediaries (such as local consultants).

f) *Inclusion/integration of ICTs in other enterprise development programmes*

The potential for development of integrated e-business support and productivity enhancement packages will be found across the whole MSME sector. Sector focused strategies should seek to use demonstrators to highlight good practice. Evidence suggests that service-based enterprises (business, financial, technical) and importers/exporters (tourist sector, manufacturing and services), and the ICT sector will reap most benefit from ICTs, and will be in a better position to transmit benefits to the wider community.

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