Information, Technology and Small Enterprise

A Handbook for
Enterprise Support Agencies
in Developing Countries

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Introduction

This handbook is for staff in agencies that support the development of small, medium and micro-enterprises in developing countries (DCs). It aims to provide those staff with a better understanding of the role of information and of information and communication technologies (ICTs) in enterprise development.

The handbook will also be of value to staff in donor agencies, government departments and professional business associations, and to researchers and students dealing with ICTs, with enterprise, and with development.

ICTs provide tremendous opportunities for DC small enterprises. This handbook identifies some of those opportunities. However, there are also tremendous dangers of failure and waste unless information and ICTs are properly understood. This handbook provides that understanding, based on research surveys and analysis in developing countries.

The handbook is divided into three sections: one on information in small enterprise; one on ICTs in small enterprise; and one on enterprise support agency strategy.

Each section is further divided into a number of sub-sections, each dealing with a key issue. Each issue will typically be covered on a single page with discussion followed by key questions that agency staff need to be addressing.

A glossary of ICT terms and some pointers to sources of further information are provided towards the end of the handbook. You are also encouraged to give feedback on the form enclosed as a final page.

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Section 1: Information in Small Enterprise

1A. Why Is Information Important?

Our whole world – including enterprise support agencies and the enterprises they support – runs on resources. Four tangible resources:

- ***Money***
- ***People***
- ***Materials***
- ***Technology***

And one intangible resource:

- ***Information***

The trouble is, while we are good at working with the tangible resources, we have been very poor at handling the intangible resource: information.

That's a problem because information is critical to two activities:

- ***Decision making***
- ***Learning***

Without good quality information, bad decisions are made and learning does not occur. This is true everywhere in the world, but it's a major problem in developing countries. Why? Because they are so *information-poor* and because their *information infrastructure* is so poorly developed.

How does information poverty affect small enterprises in developing countries? It means that entrepreneurs fail to make decisions or make the wrong decisions. It means that entrepreneurs fail to learn or learn the wrong things. That has a direct effect that means they waste money, waste time, lose out on income and, often, go out of business. Information poverty makes entrepreneurs isolated, uncertain and risk-averse.

Put this the other way round. What if the agency can help the entrepreneur access better quality information; information that is more *CARTA*: more complete and/or more accurate and/or more relevant and/or more timely and/or more appropriately presented? Then costs can go down and income can go up.

Given this direct value of information, no wonder the 21st Century is being called "The Information Century".

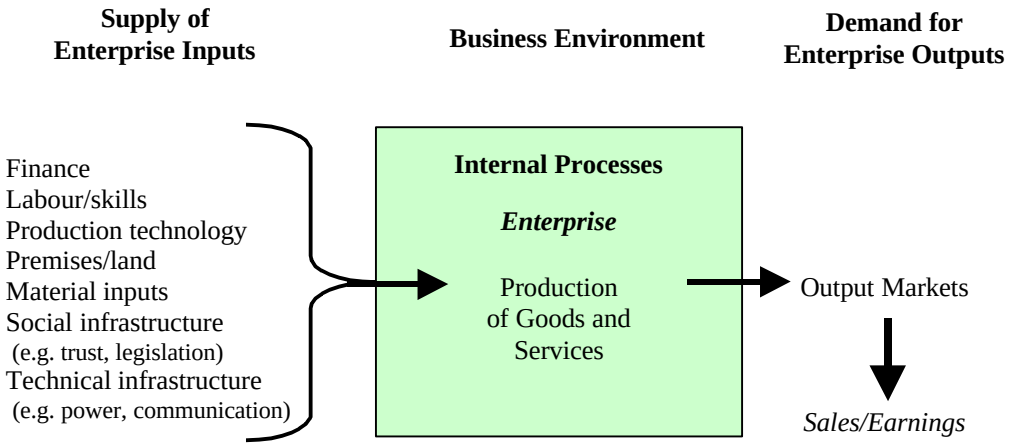
Agency Questions

- Has your agency recognised the importance of information?
- Is there a staff member with responsibility for helping enterprises with information?
- Is there a strategy for helping enterprises with information?
- If not, why not?

1B. What Information Do Small Enterprises Need?

Small enterprises (see diagram) need information about four main things:

- ***Supply***: of inputs (e.g. information on where to get materials for their business).
- ***Demand***: for outputs (e.g. information on new customers for their goods/services).
- ***Environment***: around their business (e.g. information on relevant government regulations).
- ***Internal Processes***: within their business (e.g. information on which staff are performing best).



Our research shows that entrepreneurs mainly lack information in three key areas:

- ***Demand***: information on new and existing customers.
- ***Finance***: information on how to get more finance for the business.
- ***Skills***: information on how to get more/better skills for the business.

Should all three be given equal weight? No. Above all, agencies should focus on helping entrepreneurs get *demand-related information* for two reasons. First, if sufficient demand can be found, many other enterprise problems sort themselves out. Second, agencies are already quite good at providing supply-related information (e.g. on finance and skills). They have been poor at providing demand-related information and must improve.

Entrepreneurs need information to answer questions such as:

- Who are my best customers right now?
- Who else might buy my goods/services?
- How can I access those new customers?
- How much would they pay?

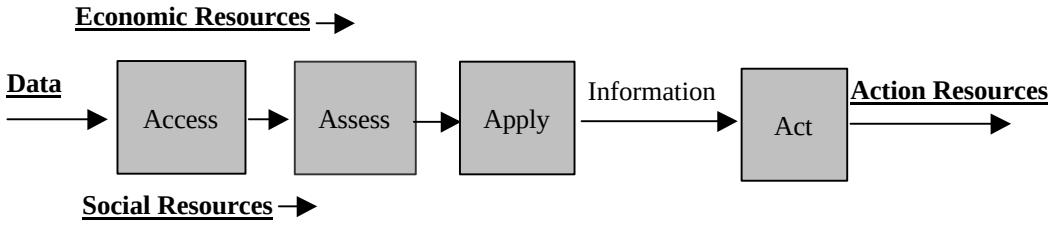
Agency Questions

- What information do the entrepreneurs you serve most need?
- How could you help them get that information?
- How do you help entrepreneurs get information on demand for their goods/services?

1C. How Do Small Enterprises Use Information?

If you give information to an entrepreneur, it is always useful? No. To understand that answer, you must first understand that you don't give information to anyone. You give *data*. Data is unprocessed facts and figures which might or might not be useful. Only if the entrepreneur processes that data and finds it useful; only then does it become *information*. And it will only be useful if the entrepreneur uses it to make a decision that is then acted upon. If the entrepreneur can't process the data, or doesn't take a decision with it, or doesn't take action on it then the whole activity is worthless.

We call this set of activities, the *information chain* (see diagram).



What do entrepreneurs need to make this information chain work? They need four resources:

- ***Data Resources***: they need relevant data to be available in the first place.
- ***Economic Resources***: they need the money, the skills, and the technology in order to access the data.
- ***Social Resources***: they need the motivation, confidence and knowledge to access, assess and apply the data, and they must trust the source.
- ***Action Resources***: they must be able to act on the decisions made with the information. This will require enterprise inputs (e.g. money, skills, technology, raw materials) plus resources like empowerment.

For small enterprises in developing countries, though, the problem is that these resources are often absent. Too often we find:

- ***Data is not available***: about customers, about prices, about suppliers, about laws, about business services, etc.
- ***Data is available but entrepreneurs can't access it***: e.g. they don't know who has details about government support schemes, or they can't afford to get those details.
- ***Data is accessed but entrepreneurs can't assess and apply it***: e.g. they don't understand the contents of the government directory they've been given.
- ***Information is created but entrepreneurs can't act on it***: e.g. they have identified new customers but can't afford to purchase materials to supply those customers.

Agency Questions

- Is you agency working to support the development of a local 'data infrastructure'?
- When your agency provides information, or information-related services such as training, does it ensure that the whole information chain will work for the entrepreneur?
- Is your agency working to provide an 'information chain package': not just data but the economic, social and action resources that entrepreneurs must have in order to turn that data into decisions and actions of value?

1D. Who Provides Information For Small Enterprises?

When information is provided for an enterprise, we can ask four questions:

- ***Content***: what is the information?
- ***Source***: who provides the information?
- ***Channel***: how is the information communicated?
- ***Recipient***: who in the enterprise receives the information?

Focusing on the second question, we see that small enterprises get their information from three different kinds of sources:

- ***Social sources***: families, friends and other social contacts.
- ***Business sources***: suppliers, customers, collaborators and competitors.
- ***Institutional sources***: government, NGO and other business support organisations.

In general terms, agencies need to help enterprises link to more sources and to a wider variety of sources. They should also help more information flow along those linkages. However, other aspects may be more important. Agencies must help improve the quality of information content/channel (judged in CARTA terms: see sub-section 1A). They must help ensure the linkage is with the right recipient in the enterprise. And they must also help improve the other information chain resources provided by the linkage (see sub-section 1C).

In these terms, for poorer enterprises, social and institutional linkages may be a higher priority. For growth-oriented enterprises, business linkages may be a higher priority.

How do you build business linkages? In various ways:

- arranging trade fairs and other meetings between entrepreneurs;
- facilitating collaborative ventures;
- creating enterprise clusters;
- encouraging sub-contracting;
- supporting mentoring schemes;
- funding ICT/information demonstrator enterprises.

Agencies should also provide inputs (finance, training, technology, etc.) via existing private sector providers. The agency itself should not provide these. This creates a more-valuable business linkage rather than a less-valuable institutional linkage.

Agency Questions

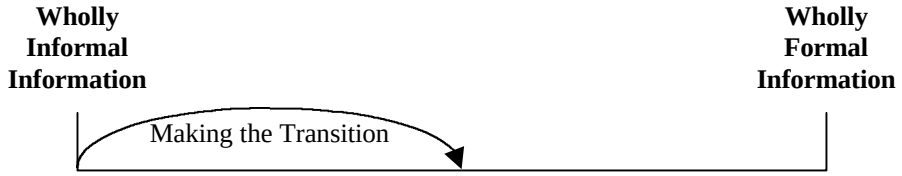
- What are the information source/linkage priorities for the enterprises you serve: more sources; more different sources; more information content; better quality information content/channel; a different recipient; and/or more information chain resources?
- What are the implications for the type of linkages you should prioritise for the enterprises?
- Should there be a shift in emphasis away from provision by the agency and towards provision by existing private sector firms?

1E. What Type Of Information Do Small Enterprises Use?

DC small enterprises 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 and don't lock themselves into an irrelevant formal information bubble.

But … informal information can also be poor quality and restrictive, prompting bad decisions and stunting growth.

In order to develop, small enterprises must make a *transition* (see diagram) 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 be in the '10-20 employee' and/or 'few tens of thousands of US dollars of annual turnover' categories.

Transition help should cover all of the information chain:

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

Agency Questions

- What is the balance of use between informal and formal information in the enterprises you serve?
- What is the balance of value and of need between informal and formal information in the enterprises you serve?
- Are any of the enterprises at or near the transition point?
- How can you help them make the transition to balance between formal and informal information?
- For those enterprises well below the transition point, do you need to focus more on supporting informal information provision?

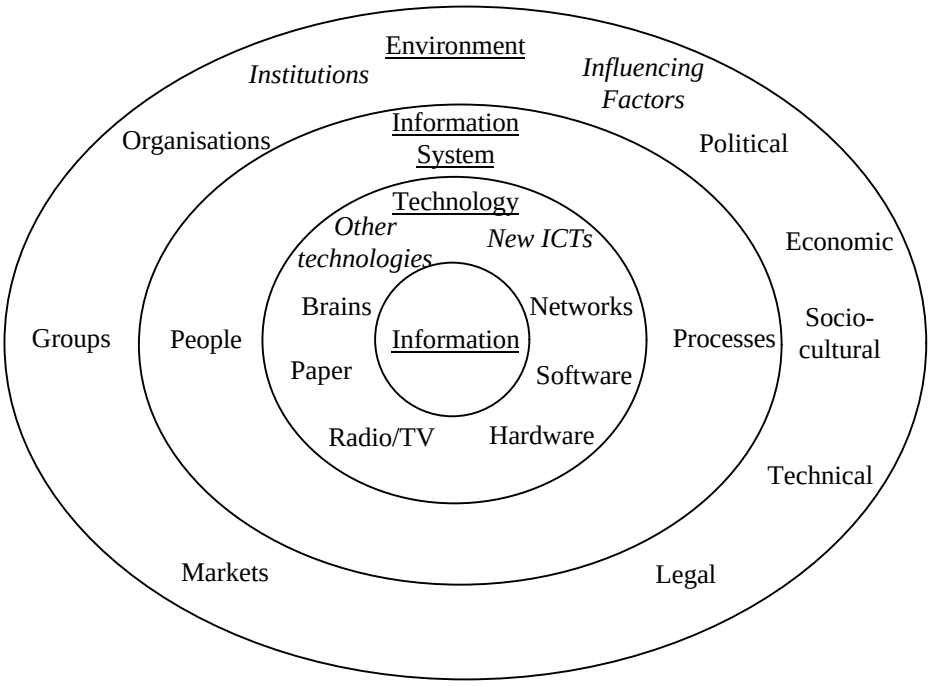
Section 2: Information and Communication Technologies in Small Enterprise

2A. What Approach Should Be Taken To ICTs?

Enterprise support agencies must take a *systemic approach* to ICTs. This has two parts.

The first part – a *holistic view* of information handled by a process chain – is described in sub-section 1C. It means agencies using ICTs in enterprise support must track the entire chain to ensure data delivered by ICTs can actually be used and acted upon. It means a multi-resource information chain package – not just ICTs alone – must be provided.

The second part is an *integrated view* of ICTs (see diagram).



The integrated approach means agencies must:

- ***be information-centred***, recognising that the value of ICTs comes from their new abilities to handle information;
- ***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
- ***understand the context*** that shapes enterprises 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:

- take an enterprise development goal as the starting point;
- then work with trainees to understand how information helps meet that goal; and
- 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".

Agency Questions

- Is your agency's approach to ICTs holistic: taking the whole information chain into account? If not, how should it be changed?
- Is your agency's approach to ICTs integrated: starting with overall goals, then seeing how information meets those goals, and only then seeing how ICTs and other technologies might help? If not, how should it be changed?
- Is your agency's approach to other interventions integrated: including information and all information-handling technologies (including ICTs) but as a means not an end? If not, how should it be changed?

2B. What ICTs Can Small Enterprises Use?

In keeping with the integrated approach, ICTs will be discussed in this sub-section but so, too, will some other key information-handling technologies.

Fixed-line Telephone/Fax

Fixed-line telephone/fax is currently the most cost-effective communication technology for DC small enterprise. It has four main uses for small enterprise:

- Making initial contact with potential customers/suppliers and arranging meetings with business contacts.
- Direct marketing of products and services.
- Obtaining information from suppliers and customers, saving both time and journeys.
- Keeping customers up-to-date and informed, e.g. about production or delivery problems and opportunities.

Mobile Phone

Mobile phones are particularly suited to business users. They let entrepreneurs answer customer calls immediately, and reach staff or business contacts while working away from business premises. This can make the difference between winning or losing an order. Although tariffs can be high, mobile phones provide greater flexibility, faster customer response and time savings compared to a fixed-line phone. They can also be obtained far more readily.

Digital mobile phones offer additional benefits:

- International coverage and use.
- Ability to send text messages.
- Access to the Web and Internet email (WAP phones only).

Electronic Mail (Email)

Email is the exchange of messages between computers. It offers DC small enterprises a number of benefits, particularly compared with post, fax or phone:

- Provides the cheapest, quickest and most reliable way to exchange business information with those customers, suppliers, etc. who are also connected to email.
- Allows a variety of information to be sent – not just messages but documents, photographs, drawings, etc.
- Messages can easily be protected, recorded and organised.
- Messages can easily be sent to multiple recipients.
- Services can be accessed by the entrepreneur while away from the office.

In order to use email, enterprises need access to a network-linked computer. Owning this is costly, but email services can increasingly be accessed from shared facilities. Potential sources and recipients must also have access to email, so email is of particular benefit to enterprises that import or export.

The Internet and World Wide Web (WWW)

The Internet is a global network of computers which can communicate with each other. Internet use by small enterprises in developing countries is growing very fast but is still very limited. For small enterprise, the Internet offers three main uses:

- email (see above),
- the Web (see below), and
- electronic commerce (see below)

The Web

A Web site contains pages of data (words, pictures, sounds, video) that are linked together electronically. A Web site can be accessed by anybody who has access to the Internet. Therefore it links DC small enterprises to a potential world-wide market.

A small business user can use a Web site to promote the business, to advertise products and services, to accept enquiries and orders, and to accept payments using credit cards. Of course, this all comes at a price – the space to store the Web site must be paid for and, for a site to be effective, it must be professionally designed and updated regularly. Enquiries from the site must also be given a quick response.

Those most likely to benefit from having a Web site include:

- Manufacturing exporters wishing to expand their sales abroad.
- Tourist businesses whose customers come from abroad.
- Businesses whose products/services can be converted to digital format – such as those working in printing and publishing, music and video publishing, software, professional and consulting services.

A broader range of firms will benefit from getting market, commercial, technical, product/service and other information from the Web sites of other enterprises and organisations. This leads to faster, cheaper, better decision making and reduces the sense of isolation felt by DC small enterprises.

Electronic commerce

E-commerce means undertaking business transactions electronically, such as buying an item at a firm's Web site by typing in a credit card number and other details. Some DC small enterprises have moved into e-commerce but this is very rare. Costs of setting up e-commerce are high, and requirements include computerised internal processes and high-bandwidth network connections. Despite this, 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.

Agency Questions
See next sub-section.

2C. What ICTs Are Being Used By Small Enterprises?

Not just in theory but also in reality, ICTs are bringing benefits to DC small enterprises. Our survey indicated that ICTs can reduce time and money costs of business processes, and can improve the certainty and quality of those processes. In terms of popularity:

- word processing remains the dominant application,
- email and spreadsheet use fight it out for second place, and
- Web use is a little way behind.

Growth rates are fastest for use of email and the Web.

ICT-using enterprises typically meet two criteria:

- ***Size***: enterprises with a turnover less than c.US$20,000 per year are unlikely to have ICTs because of the costs (see box).
- ***Sub-sector***: ICT use is concentrated in a few sub-sectors in which there are either common applications of ICTs within the primary value chain (e.g. printing or publishing) and/or linkages with ICT-using suppliers or, particularly, customers (e.g. enterprises with customers abroad).

Total Costs of ICT Ownership

Enterprises tend to be fairly good at recognising the immediate, overt costs of ownership:

- *Hardware*: the computer and peripherals (e.g. printer, modem, UPS).
- *Software*: the operating system and application programs (where not pirated).

However, they are not so good at recognising the other components that make up the total cost of ownership (TCO). TCO estimates suggest that other costs may make up as much as 60-70% of total costs. These ongoing and/or hidden costs can include:

- *Operational costs*: printer ink/toner, paper, disks, electricity, insurance.
- *Internet access charges*: local call charges plus those charged by the Internet service provider; there may be extra costs for email and for Web page hosting.
- *Upgrade costs*: new hardware and software necessary to keep up with trends.
- *Training costs*: for attending formal courses or for self-training.
- *Entrepreneur/staff time costs*: expended on planning the introduction of ICTs, on installation, on climbing the learning curve, on dealing with viruses or hackers, on playing games or searching non-work-related Web sites, etc.

The vast majority – at least 90% and probably more like 99% – of all DC small enterprises do not currently use ICTs. Why? For various reasons such as:

- Lack of money.
- Lack of skills or knowledge.
- Lack of technological infrastructure, e.g. electricity, telecommunications.
- Lack of other information chain resources (see sub-section 1C).
- Lack of 'critical mass': not enough local people/organisations use computers/email or provide Web content or are able to buy via e-commerce.

Some of these problems can be overcome by using ICT intermediaries (see sub-section 2E), but many cannot. Because of this, technological priorities for agency support should be (in descending order):

- ***Telecommunications services***: phone then fax.
- ***Other intermediate/literate/organic technologies***: personal contact, radio, newspapers, TV, newsletters.
- ***ICT-based communication applications***: email then the Web; with a priority for help transmitting data *from* enterprises before delivering data *to* enterprises.
- ***'Reality-supporting' ICT applications***: e.g. word processing.
- ***Other ICT applications***: e.g. accounting.

Wherever possible, ICTs should supplement rather than substitute for other information-handling technologies.

Agency Questions

- Which of the technologies described in sub-sections 2B and 2C are in use by the enterprises your agency serves?
- What should be the information-handling technology priorities for the enterprises that you serve?
- What benefits are those technologies likely to bring? What are the main constraints that have to be overcome? What are the likely total costs of ownership? Do the risks and costs justify the benefits?

2D. What ICT Support Should Be Provided To Different Enterprises?

The summary of priorities provided in sub-section 2C is very generalised. In reality, different enterprises need different information/ICT interventions. These differences are summarised below.

Five different ICT-related enterprise categories emerged from our survey. Recommendations for each will be addressed here though, for ease of discussion, the *networked ICT user* and *intensive ICT user* categories are combined.

Non-ICT Users: *Other Technologies First, Then ICT Intermediaries*

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 DC small enterprises.

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:

- strengthening of backward/forward business linkages,
- provision of better local market/demand information, and
- building of social capital through community networking, the development of personal communication skills, and support for more effective interpersonal networking.

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. Phones:

- support the current reality of informal information systems,
- can help extend social and business networks (thus eating into the problems of insularity that informal information systems can bring),
- clearly substitute for journeys and, in some cases, for brokers and traders and other business intermediaries, and
- meet the priority information need of this group for communication rather than for processing of information.

Fax would be a secondary priority. Telecommunications like phone/fax should mainly be provided via a communal model or – for those with a higher turnover – via an enterprise-owned model.

Other information-handling technologies should also be addressed for this group. As well as using organic social networks, the majority of current non-ICT users access information via intermediate channels (radio, TV) and literate channels (newspapers, newsletters, manuals). Such channels must be seen as the main formal information delivery mechanism for these small enterprises.

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 again 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. In communication of information, though, ICTs can substantially reduce costs and greatly increase access, and the third priority would be email followed by the Web.

However, it must be recognised that Internet-based applications are no panacea, and that many complementary inputs and actions are required if enterprises are to make use of the technology (for external marketing, for example), even via intermediaries.

Non-IT Users: *ICT Intermediaries and Better Information Practices*

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:

- interpersonal communication skills,
- enhanced financial management skills to improve business efficiency, and
- sales and marketing techniques.

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 via email and the Web 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 objectives of 'enterprise' for some in this category relate more to social purposes and to reduction of vulnerabilities than to Western models of risk-taking and entrepreneurialism.

Non-networked ICT Users: *Rounded Support for ICTs*

Non-networked ICT users are 'first-footers' in small business computing: they have access to computers on the premises, 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.

Nevertheless, there are greater ICT-related pressures within this group than felt in the previous two categories:

- Enterprises may require specific ICT support, as in the printing and publishing sector, where competitive pressures driven by rapid technological change mean enterprises must 'adapt or die' in relation to utilisation of new technology.
- Enterprises may need to expand their use of ICTs in order to achieve compatibility with customers or suppliers.
- 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 and technical assistance initiatives.

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.

Networked/Intensive ICT Users: *Priorities for Assistance with ICTs*

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 is deficient.

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.

Agency Questions

- Which user categories do the enterprises you serve fall into?
- What are the implications for agency support interventions?

2E. What Issues Do "ICT Intermediaries" Face?

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:

Identity

Who should the intermediaries be? They should:

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

Enterprise suppliers should be considered more as intermediaries:

- 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.

Similar arguments apply for other commercial intermediaries.

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 along telecentre models will be better.

Sustainability

ICT intermediaries often struggle to sustain themselves. They face sustainability pressures on at least four fronts:

- ***Finance***. ICT intermediaries in developing countries suffer the double whammy of higher-than-average technology costs and lower-than-average income-generation opportunities. Direct costs for an urban ICT-linked PC will be – at best – US$1,000 per year, much higher for many developing countries, and higher still if indirect costs are included. In rural areas, microwave, radio and satellite-based systems can rack direct costs up to US$1,000 per month. Donor or government funding may cover initial investment costs, but user charges have to be introduced to cover operation and maintenance costs. With low incomes and low demand, the economics simply do not add up in many non-urban DC locations and intermediaries fold up as funds run dry.

- ***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. No-one can say conclusively whether it is better to spend US$1 on an ICT intermediary or US$1 on digging a well. In many cases, money is not fungible: ICTs are flavour of the month and money can be spent on them alone.

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.

Agency Questions

- Are ICT intermediaries already operating to support some of the enterprises you serve? How could they be assisted by the agency?
- Could the agency facilitate access to existing ICT intermediaries for the enterprises it serves?
- If a new ICT intermediary seems a possibility for client enterprises, how will the issues of identity, sustainability and opportunity cost be addressed?

Section 3: Agency Strategy

Some further recommendations can be made relating to the overall direction of agency support for information, ICTs and small enterprise.

3A. One Size Does Not Fit All

Sub-section 2D showed that "one size does not fit all". It gave examples of the different help needed by different ICT-related categories of small enterprise. Another example is the difference between *start-ups* and *existing enterprises*. For instance, start-ups need basic locational information about input supplies; existing enterprises need information on supply improvements.

Perhaps more important than these is the difference between:

- ***Survivalists***: who have no choice but to take up the income-generating activity because they have no other source of livelihood. Income provided may be poverty-line or even sub-poverty-line. Most 'entrepreneurs' in developing countries are of this type.
- ***Trundlers***: whose enterprise turnover is roughly static and who show no great desire or no great capacity to expand. Income provided will be enough to meet basic needs. These form the second-largest group of small entrepreneurs in developing countries.
- ***Flyers***: true entrepreneurs who have taken up enterprise because they see opportunities for growth. Income levels may meet more than basic needs, and enterprises may graduate to the medium-scale category. Only a very small proportion of developing country small entrepreneurs fall into this category.

These groups need to be treated differently:

- ***Survivalists/trundlers***: 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. ICTs are of limited value.
- ***Flyers/potential flyers***: 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. ICTs 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 ICTs, and they provide a greater capacity to generate wealth, employment, exports and innovations.

Agency Questions

- Is your agency tailoring its help to the different needs of different enterprises, or is it trying to impose a "one size fits all" approach?
- What are the different categories of enterprise you serve: start-ups vs. existing enterprises; survivalists, trundlers and flyers; one sector vs. another; male-headed vs. female-headed; export vs. domestic-oriented; rural vs. urban; etc?
- What are the different information and ICT needs of these differing enterprises?
- How can you go about supporting these different needs?

3B. Be More Needs-Driven

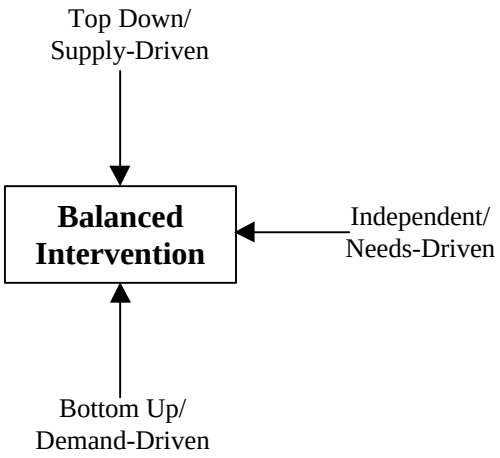
Enterprise-support agencies too easily fall into one of two traps:

- ***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 a 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 underemphasise 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 (see diagram):

- Listening to entrepreneur demands and involving them.
- Bringing in an independent understanding of needs to avoid distortions.
- Making final choices within the constraints of what the agency can supply.



Agency Questions

- In planning interventions in your agency, what is the balance between supply-, demand-, and needs-driven inputs?
- Is this balance distorted? If so, how can it be corrected?
- How could you provide an independent, needs-driven input to plans for information/ICT interventions?

3C. More Pull, Less Push

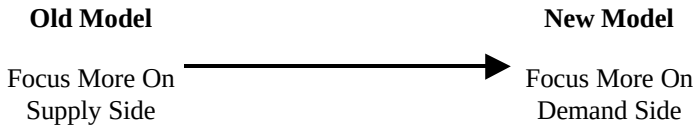
Enterprise support agencies think far too much about *supply/push* factors and far too little about *demand/pull* factors.

For example:

- They help enterprises too much with information about *input supply* (finance, skills, technology, etc.) and too little with information about *output demand* (new and existing customers). But enterprises need demand information most.
- They help enterprises too much on the *supply side* (providing microfinance, giving training, developing new technologies) and too little on the *demand side* (customer surveys, market research, sales/marketing assistance). But the impact of supply-side measures has been weak.

The same is true for information and ICTs. Agencies think and act too much on the supply-side factors (money, skills, access to ICTs) that are *enablers* to more formalised information handling, including use of ICTs. Agencies think and act far too little on the demand-side factors (linkages with ICT users, pressure from competitors, value chain processes amenable to computerisation) that are *drivers* to more formalised information handling, including use of ICTs.

Agencies must rebalance their perspective (see diagram), or else they will not achieve their information/ICT goals, and they will waste time and money on ineffective supply-side efforts.



Agency Questions

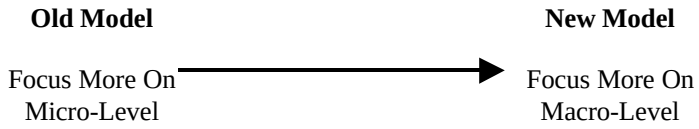
- In your agency, how do interventions – including provision of information and support for ICTs – divide between supply-related and demand-related?
- Could interventions be more balanced? If so, how: What new demand-related interventions could be introduced? What existing supply-related interventions could be phased out?

3D. More Policy Advocacy, Less Single-Enterprise Activity

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); and
- to frequently fail to achieve the intended impacts.

Agencies should focus more on policy advocacy (see diagram), 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 chain 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.

Agency Questions

- In your agency, how do interventions – including those relating to information and ICTs – divide between micro-level (supporting individual enterprises), meso-level (supporting development of other institutions), and macro-level (policy advocacy)?
- Could interventions be more balanced? If so, how: What new policy advocacy interventions could be introduced? What existing micro-level interventions could be phased out?

3E. Improving The Agency's Own Information Systems

There is a saying: "The shoemaker's children have the worst shoes". This is a warning to agencies that, in worrying about information systems in their client enterprises, they should not ignore their own internal information systems.

Agencies should be asked three key questions about their own information systems:

1. Are You Following an Integrated Approach?

In designing agency information systems, are you ensuring that ICTs are seen as a means to an end, not as an end in themselves?

In very simple terms, agencies should be following three steps in designing information systems:

i. Identification of agency change objectives.
ii. Identification of the new and/or reengineered information systems requirements needed to meet those objectives.
iii. Identification of the role that ICTs and other information-handling technologies have to play in meeting those information requirements.

To date, such an integrated approach has not been present. ICTs have been *ignored* within agencies, or have been *isolated*: treated as an independent factor that can be viewed in isolation from the rest of the agency. Alternatively – and increasingly – ICTs are *idolised*: placed centre stage and regarded as the main solution to agency problems. None of these three represents an adequate approach. They must be changed if the potential of ICTs is to be realised for enterprise support agencies.

See sub-section 2A for more details.

2. Are You Following a Holistic Approach?

A whole series of questions can be asked here:

- In designing agency information systems, are you ensuring that the whole information chain is understood and designed?
- Are you ensuring that data generated by agency information systems can be taken through the whole information chain?
- Are you ensuring that designs include provision not just of data but also of key economic resources (money, skills, technology), social resources (motivation, confidence, knowledge, trust) and action resources (including the power to act on information)?
- Are you ensuring that key information chain errors are avoided in agency information systems: data not available; data available but staff unable to access it; data accessible but staff unable to assess or apply it; information created but staff unable to act on it.

See sub-section 1C for more details.

3. Are You Closing Design-Reality Gaps?

Most agency information system initiatives fail, either *totally* (no working system is produced) or *partially* (major goals are unattained).

This failure often arises from the gap that exists between two things:

- the *design conceptions* of the agency information system (IS), and
- the *organisational realities* of the agency into which the IS is introduced.

Closing the design-reality gap will be a key priority for enterprise support agencies. How can this happen? Gap-closure techniques include:

- ***Legitimising reality***: encouraging staff to spell out the difference between rational, textbook models of what they *should* be doing and real descriptions of what they are *actually* doing.
- ***Customising to match reality***: ensuring that agencies avoid trying to install off-the-shelf solutions that have been designed for very different realities (e.g. from Western agencies or from private sector firms).
- ***Active client-vendor relationship management***: adopting innovative approaches to build mutual understanding and shared objectives between agencies and the sub-contractors who help build their information systems.
- ***Limiting change***: building *modularity* (supporting one business function at a time) and *incrementalism* (providing stepped levels of support for business functions) into agency IS projects.

Basic ICT Jargon Explained

Analogue
Describes the way in which data is transmitted – as waves – by traditional radio, phone lines and early-model mobile phones.

Bandwidth
How much data a phone line or computer network can carry, measured in *bps*: bits per second.

Byte
A measure of data storage. *Megabyte* (MB) means roughly one million bytes of data. *Gigabyte* (GB) means roughly one billion bytes of data.

CPU/Chip/Processor
Central Processing Unit: the 'brains' of the computer that undertakes calculations and controls other parts of the computer system. On personal computers, also known as the *microprocessor*. Chip speed is often measured in *Megahertz* (MHz).

Database Management System
Application software that handles storage and selective search of data on a computer.

Digital
Describes the way in which data is transmitted – as 1s/0s – by computers and modern phone lines and mobile phones.

Directory
A collection of computer files stored in one place.

Disk
A special disk that stores data or semi-permanently. Some are magnetic disks: a *hard disk* is held inside the computer; a *floppy disk* can be carried around. Some use optical compact disks: *DVD-ROM* (digital versatile disk read-only memory) has at least seven times the capacity of *CD-ROM* (compact disk read-only memory).

EDI
Electronic Data Interchange: computer-to-computer exchange of electronic documents for business.

Email
The transfer of messages between computers.

File
When work is done on a computer and then stored on a disk, the result is a called a file.

GSM
Global System for Mobile communications: a digital phone network standard.

Hardware
Physical items of ICT: computers, cables, etc.

Home Page
The first page you see when you connect to a Web site on the Internet.

HTML
HyperText Markup Language: a computer language used to create Web pages.

Hyperlink
A connection linking different Web pages via the Internet.

ICT
Information and Communication Technology: electronic means of handling digital data.

Internet
World-wide communication system – a network of networks – that connects computers and allows them to exchange data.

ISDN
Integrated Services Digital Network: a digital phone line capable of transmitting data more quickly than a standard line.

ISP
Internet Service Provider: a company that provides you with access to the Internet.

Modem
Modulator/demodulator: a device that allows computer signals to be transmitted over analogue phone lines.

Network
Computers joined together so that they can communicate with each other. A *local area network* (LAN) covers a single building; a *wide area network* (WAN) covers a broader area, typically linking computers in different towns or countries.

Peripheral
Anything that is not part of the main computer case but connected to it. This includes devices such as the *keyboard* (for typing); *mouse* (for moving the pointer on screen); *scanner* (scans words/images on paper into the computer); *monitor*/*screen* (that produces the image on a computer); or *printer*.

RAM/ROM
Two types of computer memory that store data on special computer chips. *Random access memory* (RAM) loses its data when the computer is switched off; *read-only memory* (ROM) does not lose its data.

Search Engine
Software that helps you find what you are looking for on the Web.

Software
The instructions that make a computer work. A particular set of instructions that performs a function is called a *program*. If offered for general sale, this is a *package*; if produced for a single, specific customer, this is *custom software*. There are three main types of software: *systems software* (that controls basic computer operations, like the operating system); *application software* (that carries out a particular task, like word processing); *programming software* (that builds other software).

Spreadsheet
Application software that handles numerical (and other) data on a computerised matrix of cells.

WAP
Wireless Application Protocol: a system that allows mobile phones to access the Internet and its services.

World Wide Web (WWW)
A collection of linked documents (*pages*) connected via the Internet. The pages can hold words, pictures, sound and video.

Web Site
A collection of Web pages published by a company, organisation or individual.

Word Processing
Application software that handles documents on a computer.

Sources of Further Information…

…on information, ICTs and small enterprise:
Web Site: http://www.man.ac.uk/idpm/ictsme.htm

…on information and ICTs generally:
Book: Laudon, K.C. & Laudon, J.P. (2000) *Management Information Systems*, 6th edn, Prentice Hall, Upper Saddle River, NJ.

…on building information systems:
Book: Bell, S. & Wood-Harper, T. (1998) *Rapid Information Systems Development*, 2nd edn, McGraw-Hill, London.

…on closing design-reality gaps:
Book: Heeks, R. (2001) *Reinventing Government in the Information Age*, Routledge, London.

…on ICTs and development (including relevant donor initiatives):
Web Site: http://www.man.ac.uk/idpm/devtlinx.htm#itdev

…on small enterprise development:
Book: Mann, C.K. et al (1989) *Seeking Solutions*, Kumarian Press, West Hartford, CN.

Web Site: http://www.man.ac.uk/idpm/devtlinx.htm#sed

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