

Fact Sheet

ICT-utilisation of Small and Medium Enterprises (SME) in Tanzania¹

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Information and Communication Technologies (ICT) are regarded to be a powerful tool for socio-economic development. Effective ICT-utilisation, appropriate applications, and individually tailored solutions can create cross-sectoral opportunities and, thus, ICT can play a substantial role to address a number of goals on the development agenda. In an attempt to identify sectors that are likely to be responsive to technological change and promise high return on investment, Small- and Medium-Enterprises (SMEs) have materialised as one potential target sector to harness ICT for development.

SMEs are often considered to be a key source of productivity, growth, and job creation and, hence, their performance and the environment, in which they perform, are seen as an important factor for economic development. Though the empirical evidence to support this view is not always clear, in most developing countries SMEs, in fact, account for the majority of firms and a large share of employment.

The potential impact of ICT on an enterprise's efficiency and productivity explains why the utilisation of technology presumably has strong linkages to the enterprise's competitiveness. This is applicable to different levels: improvement of internal business procedures, lowering of transaction costs, and a better understanding of the operating environment with regard to both demand and supply. Even beyond such traditional approaches, new business opportunities seem to appear, like the formation of new business-platforms, creation of information-sharing and networking facilities, and prospects of cluster-building in emerging market segments.

However, in most cases such descriptions refer to the potential of SMEs, not their actual performances. They draw round a vision and offer a roadmap to pave the way for the road ahead. But to what extent do they reflect the situation on the ground? Are SMEs ready to take advantage of ICT or is it just wishful thinking of some IT-enthusiasts?

To approach these questions, this fact sheet provides some empirical data on the ICT utilisation of SMEs in Tanzania.² If any of the broad objectives are to be targeted, a starting point must be identified from which to proceed. This fact sheet wants to contribute to this process. Looking at the ICT-utilisation of SMEs, it tries to identify the size of the gap between reality, i.e. which applications are used for what purpose to what extent, and opportunity, i.e. areas which offer a starting point for further and more elaborated ICT utilisation.

The survey data covers a sample of 150 Tanzanian SMEs that were randomly selected and came equally from the food processing, textile, and tourist sector. Surveys were conducted in Dar es Salaam, Arusha, Mwanza, Zanzibar (Urban West) and Mara regions covering both urban and rural enterprises. General characteristics of the surveyed enterprises can be identified with regard to their employed workforce and their scope of business activities. The enterprises employed between 2 and 45 employees with an average number of 12, and the majority of enterprises employing a workforce between 4 and 16 staff. The majority of SMEs solely concentrate their business activity on the local market (66%). 10% operate nationwide, 3% in East Africa and 7% have business operations in the rest of Africa. International business beyond Africa is done by 14% of

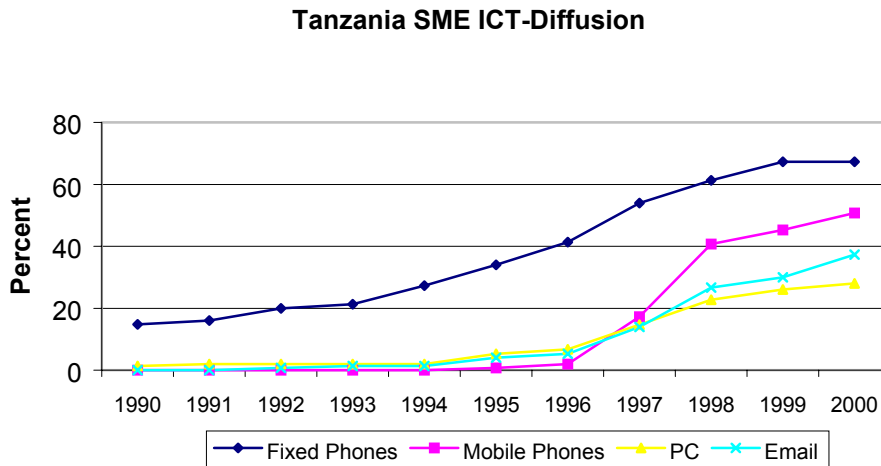
¹ This fact sheet is part of the ongoing research project 'ICT for Development: The Case of Tanzania' conducted at the Institute of African Affairs, Hamburg, and financed by the Fritz Thyssen Foundation, Cologne. The fact sheet aims to provide some preliminary results of work still in progress. Hence, comments are welcome and can be sent to nielinger@duei.de.

² I am highly indebted to Francis Matambalya (University of Dar es Salaam), who conducted the survey in early 2000 and generously made the raw data available. His excellent work has provided the basis for this new analysis, in which the given data have been re-edited and re-organised and accordingly processed to meet the new objectives. The output of Francis' work, that focused on the impact of ICT on micro-level competitiveness, can be found in: Matambalya / Wolf (2001) and Matambalya (2003).

the enterprises. Taking into account that it is mainly the tourist sector that operates internationally – though there are exceptions – the average SME in Tanzania operates on a fairly labour-intensive basis and serves mainly the local and regional markets.

With regard to ICT, the following observations can be made:

Box 1: ICT-diffusion in Tanzanian SMEs



Box 1 gives an overview of ICT-diffusion among Tanzanian SMEs between 1990 and 2000. Clearly fixed line phones present the most prevalent technology. Their steadily increasing number coincided with the rehabilitation of the telephone network by the public telephone operator TTCL since the early 1990s. The flattening growth rate since 1999 that evens out below the 70%-mark points towards a gradual saturation in this segment.

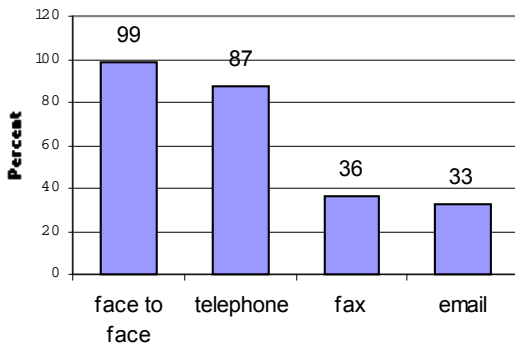
Mobile phone, PC and email penetration took off in 1996. Whereas the average ICT diffusion in Tanzania considerably caught up between 1999 and 2001 (according to ITU data, but also supported by own research findings), SMEs demonstrated significant growth rates between 1996 and 1998. Thus, they can be described as early adopters of the new technologies. They responded to new opportunities as soon as services were provided and, therewith, underlined their ability to react flexibly and immediately to a changing environment. Especially mobile phone subscription increased rapidly from almost zero in 1996 to remarkably 40% in 1998. This suggests that there was mainly a demand for basic (= telephone) communication, either in addition to fixed line phones or as their substitution that boosted the subscription numbers.

PC and email diffusion also grew substantial since 1996, but less significant than telephone growth rates. The similar growth pattern implies that email introduction has been a strong impetus to investment in computer equipment. That email is slightly higher than PC utilisation suggests that some SMEs meet their demand for ICT by using public access facilities.

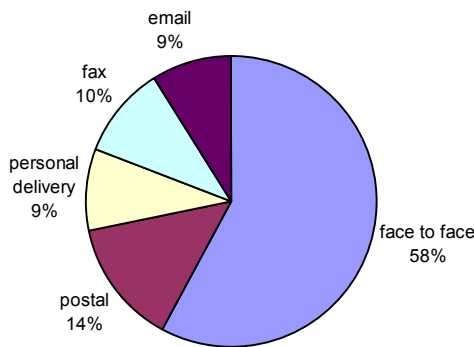
However, ICT diffusion rates have slowed down since 1999. Possible explanations might be that (1) those, who are able to utilise the technology, are already sufficiently equipped, (2) prohibitive costs prevent any further advanced ICT utilisation, or (3) any further ICT utilisation is not regarded as a means to increase the enterprises' economic opportunities.

Box 2: Means of business communication

Means of Communication



Means of business correspondence in % of total correspondence



Box 2 assesses different means of business communication. Whereas the first chart focuses on the means available regardless of their actual utilisation, the second chart quantifies different channels of business communication. Both diagrams reveal a large prevalence of face-to-face communication. Apart from the accessibility of different means of communication, personal communication is the most dominant mode to exchange information, and has remained so in spite of the arrival of alternative techniques to communicate.

Besides, telephone communication has an outstanding role in doing business. An overall diffusion of almost 90%, either fixed line, mobile or public access, underlines the importance of the telephone.

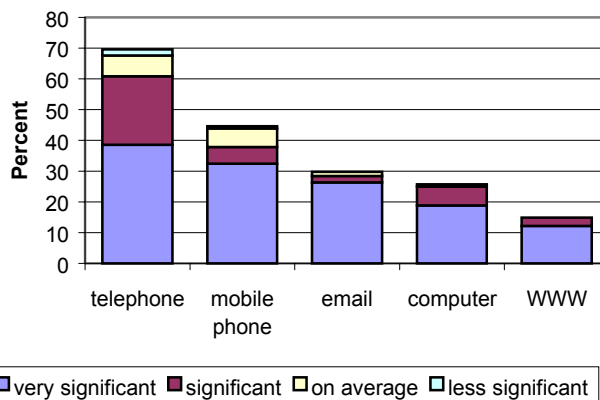
Furthermore, there is a remarkable disproportion in the availability of fax and email and their actual usage. 36% of the enterprises have access to a fax-machine and one-third have access to email. However, both means account for only 10% or 9% of total business correspondence, leaving outstanding 81% of business correspondence to traditional, non-electronic means.

Box 3: Significance of ICT for Economic Performance

Box 3 represents the perceived significance of different ICT for economic performance. The height of the bars refers to the number of responses, the different staples in each bar reflect the assigned significance ranking from very significant to less significant.

The perceived significance of technologies coincides with the rate of their diffusion, hence telephone ranked highest and the WWW lowest.

Significance of ICT for Economic Performance



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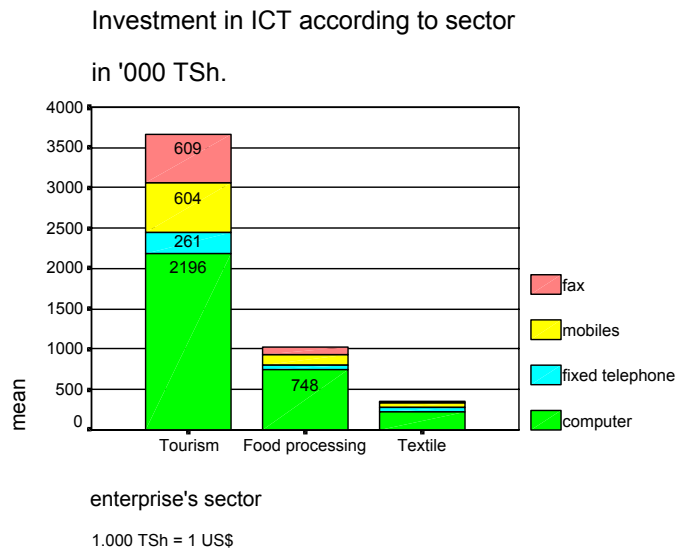
Though this box refers to the perceived and does not reflect the actual significance of the individual technology, it, again, exposes a clear ranking. 60% of respondents recognized the telephone and 38% the cell phone as 'very significant' or 'significant'. Computer based applications are led by email (28%), then come other computer applications (25%) and last is the World Wide Web with 12%.

Interestingly, responses referring to an 'average' or 'less significance' decrease as overall responses decrease, too. While about 10% or 5% regard the telephone or the cell phone to be less important, email and computer based applications count only 1-2% of indistinctive answers and the WWW counts even none. This can be interpreted that either the few users of computer-based communication are quickly convinced of the relevance of the new technology, or more likely, that the number of so-called desired or expected responses (i.e. the interviewed answer the way they think they are expected to answer) grew as the questions became more computer-oriented and the sample shrank, consequently.

Box 4: Investment in ICT according to sector and region

ICT are unevenly distributed with regard to both their sectoral and regional spreading as the two charts illustrate, respectively.

Mean investment in ICT equals roughly 1.100 US\$ per company. Divided into different components it is approx. 890 US\$ for computers, 35 US\$ for fixed telephone, 30 US\$ for cell phones and 165 US\$ for fax machines.



With regard to the total investment in computers, the investment ratio between investment in hardware and software is 7:1, indicating that only a small number of enterprises have purchased any additional or specialised software. Consequently, most SMEs felt to be sufficiently equipped with the software packages coming with the purchase of the computer, or, in fact, using illegal software copies.

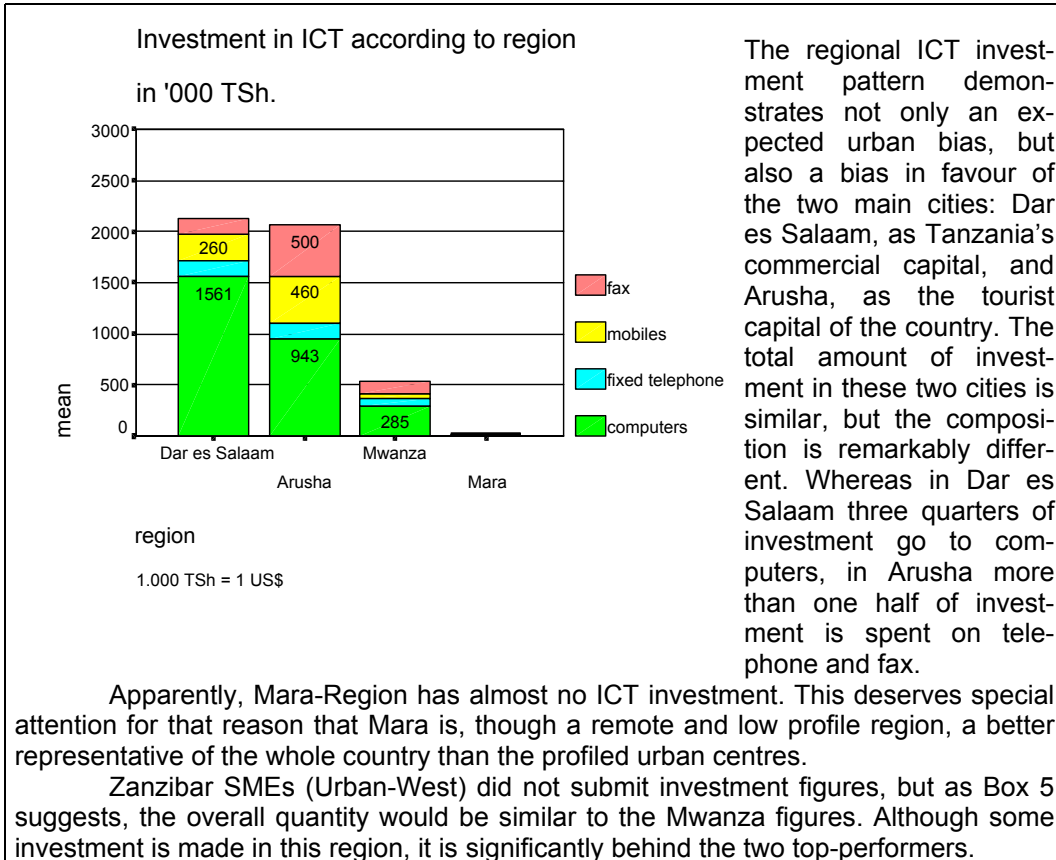
Reminded that the selected SMEs came equally from the three sectors surveyed, the tourist sector alone accounts for more than two thirds of all investment in ICT among Tanzanian SMEs. The investment rate of the food processing sector is similar to the Tanzanian average, leaving the textile sector far behind.

Though the extent to which the tourist sector leads the investment scale might come as a surprise at a first glance, it reflects two particularities of the sector: (1) the outbound perspective of tourism that requires by its nature intensive communication, and (2) the fact that mainly the premium tourist segment is targeted, which in turn demands a good provision of services.

The investment of the two remaining sectors might correspondent to their significance in the Tanzanian economy, where some renewed effort is put into food processing, while the textile sector has experienced a steady decline during the last years.

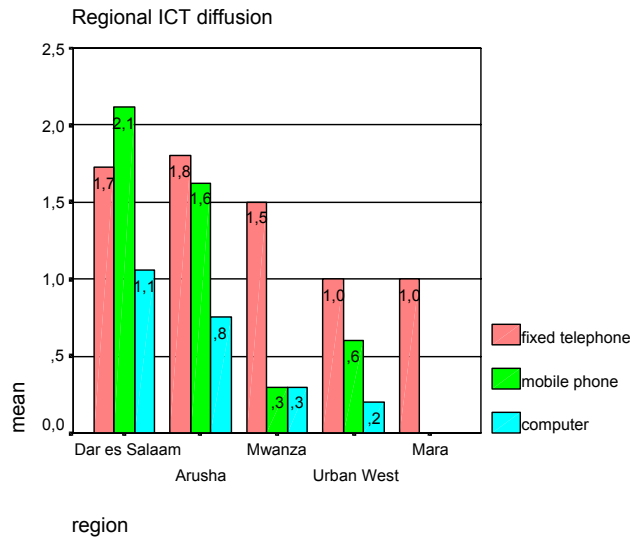
Although the sectors differ substantially in their amount of investment, they have a similar pattern in their respective investment ratios: Roughly two thirds of investment is spent on computer equipment, the remaining third is spent on telephone, cell phone and fax.

box continues



Box 5: Sectoral and regional ICT-diffusion

Box 5 provides the number of ICT components and their regional and sectoral distribution. On average, SMEs account for 1.62 direct fixed lines, 1.16 mobile phones, and 0.52 computers per company. With this numbers the sector is, according to ITU data, clearly above the Tanzanian average and they make clear that the SMEs are pioneers of ICT diffusion in the country. However, these qualities are unevenly distributed and result in a regional and sectoral bias in ICT utilization.



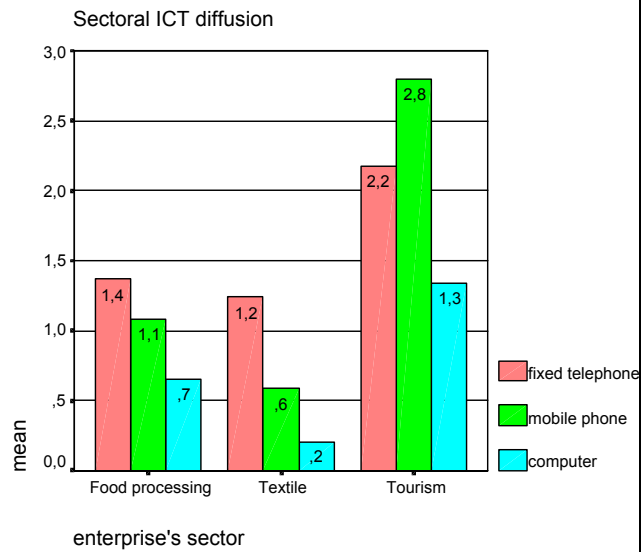
Dar es Salaam and Arusha take the lead, still Dar es Salaam with a higher cell phone penetration and a slightly higher computer density. Mwanza and Zanzibar are midfield with just a small number of computers and a clear focus on telephone services. Again, Mara comes last reflecting the marginal role of ICT in remote and rural areas and the virtual inexistence of any cell phone or internet services. Enterprises rely on one TTCL line on average.

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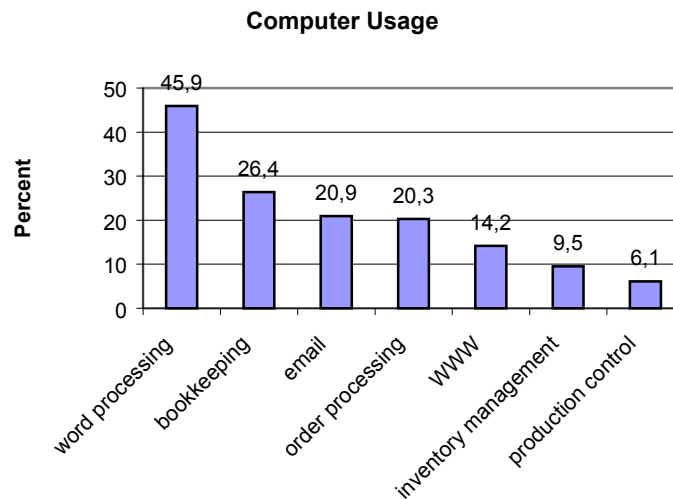
As before, sectoral diffusion figures reveal the wide above average performance of the tourist sector. Tourism companies make considerable use of ICT and are equipped with 2.2 fixed phones, almost three cell-phones and 1.3 computers per enterprise.

Next is the food sector that very much equals the Tanzanian average numbers as given above.

The textile sector is hardly utilizing any ICT. Computer numbers can almost be neglected. A clear focus is on telephone services.



Box 6: Computer usage in Tanzanian SMEs

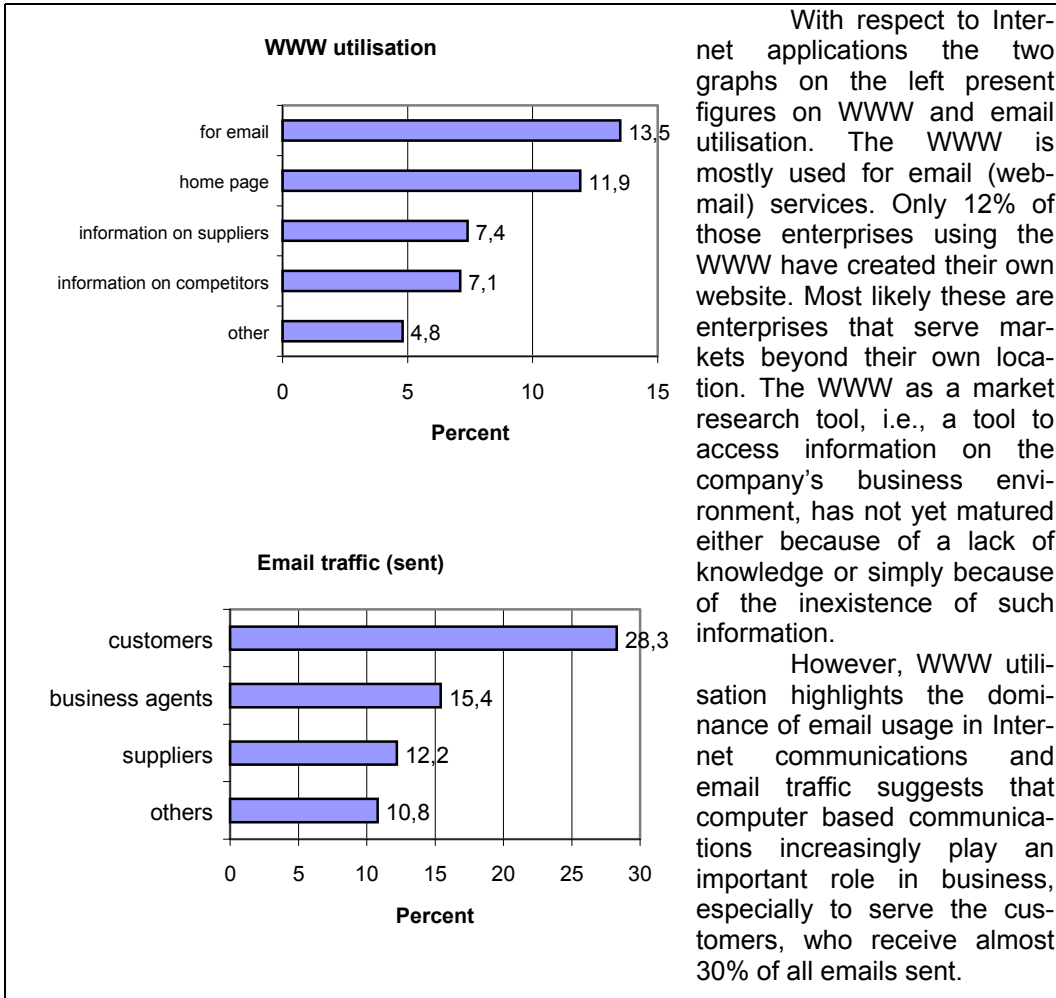


Box 6 provides information on the type of computer applications utilized in SMEs. The sample coincides with the total 28% of Tanzanian SMEs that are computer owners as given in box 1. The figures reveal a clear ranking of applications that are available and in use.

With roughly 46% word processing is the most widespread application. Internet communication (email, WWW) and other advanced office, management or controlling applications are secondary with only a modest rate of diffusion. Herein, bookkeeping and order processing as basic input and output control have some significance, advanced applications as stock listings or other managerial tools for decision making are rarely utilised.

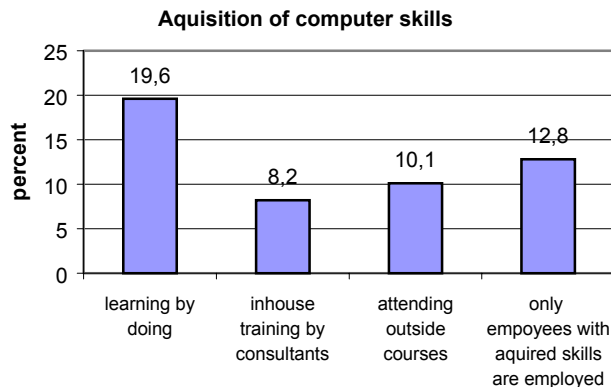
Furthermore, there is a clear hierarchy of software applications. The more complex the software, the less it is applied. This might be due to the training needed to use the software efficiently, but also to the costs of more complex software solutions.

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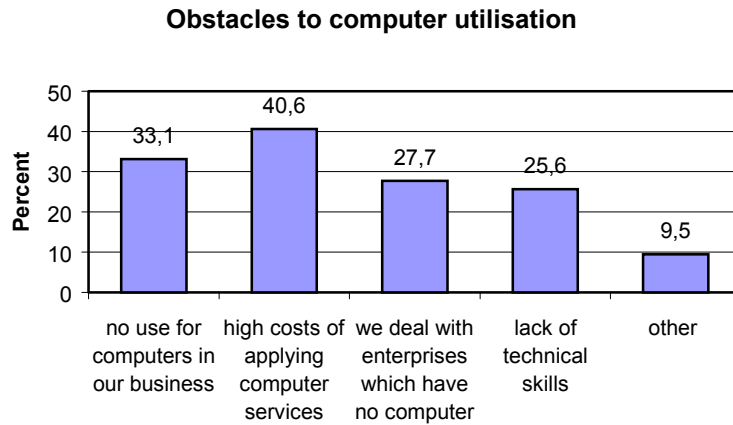
Box 7: Aquisition of computer skills

The majority of enterprises do not offer any formal computer training to their employees. 20% of the enterprises rely on learning by doing methods, which, in turn, restricts computer utilisation to basic applications. Some 13% bypass the problem of training altogether by employing only skilled employees.



Only a minority of 18% of enterprises offer formal computer training courses to their staff. The similar level of in-house and outside courses deserves attention, because in general in-house training is only suitable when a critical mass of trainees is available. This suggest that, again, the heavy ICT-users influence the picture in an over-proportional manner

Box 8: Obstacles to computer utilisation

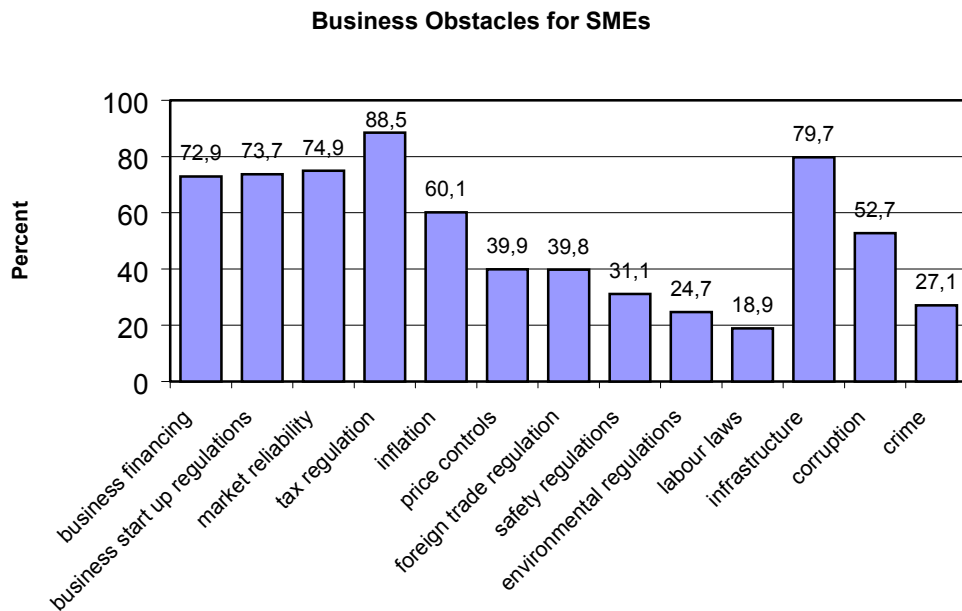


Box 8 summarises the main obstacles of computer utilisation as identified by the surveyed SMEs. Apparently, high costs represent the main impediment (41%). Together with the 26% of responses that state that a lack of technical skills prevents further growth in ICT-usage, deficient resources and capacities to harness ICT for business performances form a major barrier to computer utilisation for two thirds of the companies.

A second response set is given by those, who do not see any use of computers, because the technology is irrelevant for their business (33,1%) or for the interaction with their business partners (27,7%).

In sum, both response sets contribute to a probable vicious circle. Computers are dismissed due to high costs or skills needed. High costs or a lack of skills led to a scanty diffusion of ICT, which in turn contribute to their peripheral nature.

Box 9: Business obstacles for SMEs



box continues

Whereas the previous boxes solely focus on ICT-utilisation of Tanzanian SMEs, box 9 covers the broader picture of SMEs' general business environment. Advocating ICT as a means to improve business performances of SMEs must take into account that communication is only one factor, and according to the chart only a marginal one, that restrains a better SME performance.

Though issues of infrastructure rank second in the chart, communication infrastructure as a business obstacle accounts for 'only' 45%, if inquired separately – compared with higher values for electricity (69%) and transport infrastructure (59%) and a lower value for water (41%).

Thus, communication ranged in the lower third of perceived business obstacles. ICT can improve SME performance, but strategies that aim to strengthen SMEs must take into account the complex environment and the high number of various business obstacles SMEs are facing.

Concluding remarks

1. The data provided here reflect the situation for Tanzanian SMEs in early 2000. Although ICT-diffusion has increased since then, growth rates in the SME-segment have sizeably slowed down and are well below the exceptional 1996-1998 growth rates – an assumption based on several background interviews and observations done during two field visits in Tanzania in 2002 and 2003. Thus, the basic findings of this fact sheet are still applicable.

A notable exception is the use of mobile telephones that has witnessed a quantum leap both in terms of coverage and subscription rates from mid-2000 onwards. Most likely, SMEs like others have taken advantage of these newly available services and improved their business situation with respect to basic telecommunication services.

2. The survey reveals a substantial predominance of traditional means of communication. The notable growth period in the late 1990s, where some early adapters have developed some ICT-capacities, cannot conceal that the overall diffusion remains low. In addition, under-utilisation of ICT is a common feature and a wide spread gap between availability and effective use can be observed.

3. Figures of ICT-utilisation show a strong regional and sectoral bias. Usage is concentrated in the urban centres, particularly in Dar es Salaam and Arusha, and in the tourist sector.

The urban bias implies that usage depends on the availability of the technology and reasonable pricing. Furthermore, it emphasises the advantageous condition of an existing critical mass of IT users, because the benefits of a network increases, the more users are connected to it (=network externalities). In addition, the sectoral bias suggests that information-intensive and internationally oriented business segments make use of ICT above average.

In sum, the main stimulus to introduce ICT is to lower communication costs and to fasten communication. Therefore it is rather to lower transactions costs than the introduction of new management tools that has driven the diffusion of ICT.

4. If taken into account that the heavy ICT users distort the average usage figures and that the typical Tanzanian SME does belong to them, then ICT, in fact, are even less significant for the majority of SMEs than indicated in the graphs above.
5. If SME development is regarded as a suitable instrument to raise economic growth and issues of SME promotion are to be addressed – either from politics, the donor community, SME development agencies, or from the SMEs and their associations themselves – any approach needs to deal with the challenging mix of business obstacles and the heterogeneous character of different types of enterprises.

6. Focussing on the intersection between SME development and ICT promotion, different starting points can be identified. Generally, the idea of cluster-building and the facilitation of joint action of dispersed and isolated firms might bring new opportunities, such as information and resource sharing, joint marketing or joint lobbying. So attained “collective efficiency” could bring about better market access, flexible provision of services and products, and scaling up of business activities in emerging and lucrative market segments.

However, such approaches are more feasible for more developed and well-managed SMEs. For the majority it would mean to do the second step first. If ICT-capacities are sequenced, most SMEs in Tanzania are in a start up phase. First, there must be a necessary understanding of the potentials of ICT before basic application training can make a difference and can eventually expand to advanced applications to assist efficient decision-making procedures.

7. The overall figures and the low level of ICT diffusion among SMEs in Tanzania might allow critics to question the role of ICT altogether. But this would be short-sighted:

Firstly, it would ignore the global evolutionary process of ICT diffusion. In one way or the other most enterprises will be confronted with the new technology in the future. Therefore, a comprehensive ICT support for SMEs could establish best practice approaches that avoid hardships, dead ends, and bad investments.

Secondly, creating a sustainable strategy for SME-development has to include the anticipation of future junctions. Approaches that draw upon the strengthening of networking capacities – even in an information-poor environment – need to address the role of ICT as an important facilitator.

Thirdly, premature criticism of ICT-solutions for SMEs neglects the information intensive character of managerial decision-making. Certainly there is always a good amount of information available offline. But successful examples show that ICT can contribute to the organisation, processing, and analysis of business relevant information. Considering various business procedures, it becomes evident that the identification of a target market or the development of marketing strategies is based upon a collection and interpretation of market information from numerous internal (sales record, stock control, invoices, etc.) and external (administrations, trade associations, newspapers, etc.) sources. These are daily business routines. Effective handling of such activities can unleash the potentials of SMEs and ICT can play a role to this process.

8. The individual SME might be overburdened to implement a sustainable and well-tailored ICT Strategy to make effective use of ICT.

Decentralised SME-service centres could assist SMEs to cope with the challenge. Computer training that meets the different demands from basic to advanced business application, Internet connectivity and email services could be only one part of broad consulting and advisory services covering issues like business registration, financing, regulatory matters or business lobbying. The idea of a one-stop agency to facilitate business, for example, has a fairly good record with respect to the Tanzania Investment Centre (TIC) to attract foreign direct investment. SME service centres could form a congruent equivalent for the domestic market.

Service centres must neither be costly nor complex. Their set up could be structured alongside different service modules, where each centre provides only suitable parts of the whole package of services. Furthermore, such centres could make use of existing infrastructure as provided by organisations like SIDO (Small Industries Development Organisation), SEDA (Small Enterprise Development Agency) or the regional branches of TCCIA (Tanzanian Chamber of Commerce, Industry and Agriculture).

Literature:

Matambalya, Francis, Wolf, Susanna (2001): The Role of ICT for the Performance of SMEs in East Africa. Empirical Evidence from Kenya and Tanzania, ZEF Discussion Paper on Development Policy, No. 42, Bonn, December 2001

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