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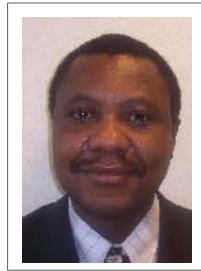


CONNECTING PEOPLE

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MOBILE COMMUNICATIONS IN AFRICA

Dr. Tim Kelly

Abstract:

Mobile communications have been one of Africa's biggest success stories. In 2003 some 13 million new mobile subscribers were added, a figure equivalent to the total number of African telephone subscribers in 1995. Africa's mobile market has been the fastest growing of any region over the last five years. The article also looks at the most significant socio-economic impacts of mobile phones on the lives of individual Africans.

The phenomenal development of mobile communications since the turn of the new millennium demonstrates the potential of Information and Communication Technologies (ICTs) to transform economic and social life on the African continent. After years of being an ICT laggard relative to other developing regions of the world, mobile communications have pushed Africa to the forefront in a new information revolution.

Consider these facts:

- Africa has attracted more ICT users since 2000 than in the previous hundred (since ICT is a recent technological revolution, '...the previous hundred years' sound more impressive than it really is);
- Africa was the first region in the world where the number of mobile users overtook the number of fixed lines (in 2001) and by the start of 2004 there were more than twice as many mobile users as fixed lines (see Figure 1, top chart) (where are these charts?)
- Africa has had the fastest growing mobile sector of any world region over the last five years and has the highest percentage of mobile users as a per-

centage of total telephone subscribers (Figure 1, bottom chart);

- More than three-quarters of African states now have competition in the mobile market and more than 95 per cent of African users enjoy a choice of operator.

Yet, paradoxically, this success story was not anticipated. The majority of forecasts regarding the adoption of mobile communications in Africa vastly underestimated the real demand for communications on the continent.

These failings in forecasting and measurement were based on the fundamental misapprehension that Africans were too poor to afford high quality modern telecommunications. The subsequent experience of growth in mobile communications has shown this to be false. Yet, there remains a temptation to repeat this myth in a different form. In particular, much of the current debate concerning the so-called "Digital Divide" seems to assume that the current *status quo* in access to information and communication technologies (ICTs) will continue to exist long into the foreseeable future and that market mechanisms—letting users decide what they want—will not succeed in closing the divide.

Africa has added more ICT users in the first few years of the new century than in the previous hundred

CANADIAN GSP EXTENDED

The Canada GSP scheme (officially called Generalized Preferential Tariffs or GPT) for both developing and least developed countries has been extended from June 2004 till June 2014 (Bill C-21, Amending the Customs Tariffs). No other amendment has been introduced, meaning that with regard to products and countries eligibility criteria and coverage the "old rules" remain fully applicable. As in the case of the EU GSP scheme, possible revisions of the Canadian GTP will be considered in light of the negotiations at WTO within the Doha Round.

Finally, following the same path of all major trading partners providing GSP treatment to the EU newly acceded countries, effective May 1, 2004 (C.N.569) all goods that originate in Cyprus, the

Czech Republic, the Republic of Estonia, Hungary, the Republic of Latvia, the Republic of Lithuania, Malta, Poland, the Slovak Republic, and the Republic of Slovenia were withdrawn from the General Preferential Tariff. Such goods are now accounted for under the Most-Favoured-Nation (MFN) Tariff.

LDCs are countries with a per capita GNP of less than \$1500 a year in 1998 (World Bank)

Sources

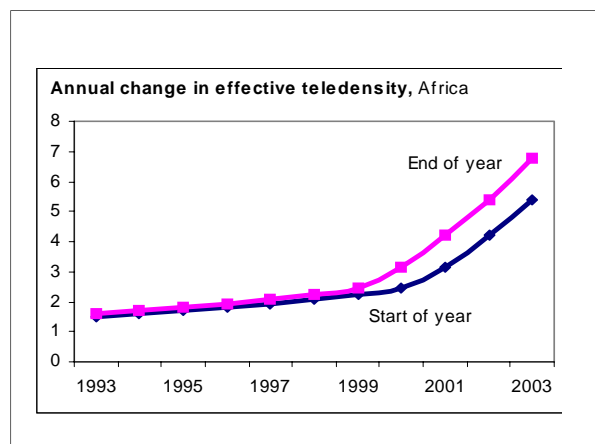
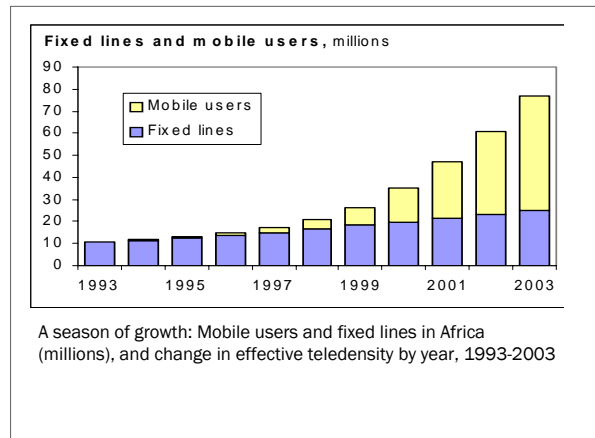
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Revolutionary growth

Since 1998, the growth rate in effective teledensity has been 24.6 percent per year is more than *four times higher* than that of any comparable period in the past (ITU) This steep change is confirmed by the impact on annual change in effective teledensity (see Figure 2, bottom chart). For many young Africans, their first experience of ICTs will be in using a mobile phone. But is there a danger that this will be their *only* experience? The popularity of mobiles in Africa may be to the detriment of growth in the fixed line Internet. Africa's share of global Internet users (1.8 per cent) is far below its share of global mobile phone users (3.8 per cent) and mobile phones outnumber personal computers by five to one. At some stage in the future, the mobile phone network (or more accurately, wireless technologies in general) will provide a viable solution for low-cost, high-speed access to the Internet, but this is not likely to happen within the next five years. Thus take-up of Internet in Africa may be constrained by the lack of growth in the fixed-line network.

Do ICT's in Africa matter?

Does it matter that there are now twice as many mobile phones on the continent of Africa as there were 18 months ago? Does the rise of mobile phones simply mean that already rich corporations that provide mobile phone service become richer, at the expense of poor Africans, who would be better



off using lower cost fixed-line telephones? Should policy attention be focussed on addressing the "digital divide" as some have suggested, as a better way of raising productivity, than on addressing "digital opportunities" in ICTs?

ICTs do matter. It is no accident that Africa is currently enjoying its fastest rate of economic growth for almost two decades, and that this period coincides with the rise in mobile communications. But how do ICTs contribute to increasing productivity and general economic and social development? Although much research work on the links between telecommunications and development have focussed on evaluation of specific projects (e.g., creation of a multi-purpose telecentre, a telehealth project or distance learning university) the more profound impact is likely to be more modest, and to operate at a micro-scale. Arguably, the most significant socio-economic impacts of mobile phones on the lives of individual Africans in rural areas would include:

Entrepreneurship

- Turning under-employment into self-employment and entrepreneurship. For the many Africans who work in the informal economy, access to a mobile phone can greatly extend the pool of possible clients. Resale of telephone service, e.g., through privately owned teleshops, is also an important source of employment.

Remittances

MOBILE COMMUNICATIONS IN AFRICA CONTINUED.....

- Income, in the form of remittances sent from family members working in towns, or outside of the country, play an important part in the economic life of rural areas in Africa. Access to mobile phones and other ICTs can make the payment of remittances more reliable, more efficient (fewer middlemen) and possibly more regular as communication helps to keep the extended family unit in closer contact.

Price harmonisation

- Any ICT that assists in the flow of information, for instance, the price of goods in different locations (town versus rural areas), will tend to improve the functioning of markets and combat excessive price gouging.

These beneficial effects of mobile phones may be less high profile than, say, the establishment of a major telehealth project, using leased lines to transmit X-Ray images to consultants in foreign countries, but they arguably reach more lives and are potentially more sustainable.

African Investors

Another interesting factor of the current mobile communications boom is that much of the investment has come from within Africa itself, rather than from outside the region. The leading five African mobile consortia, account for 32.8 million subscribers, on a proportionate basis, or 63 per cent of Africa's total. The top three (Vodacom, MTN, Orascom) are headquartered on African soil and a fourth one (CelTel) has mainly African investors. It seems that foreign investors may have been scared away by the pessimistic outlook for African telecommunications that was promoted as the orthodoxy of the 1990s. This left the market open to local investors who have, on the whole, made a very profitable business out of supplying Africans with cell phones. Four out of the five consortia, for which separate profit and loss accounts are available, made US\$0.73 billion in profits in 2003 on revenue of over US\$6 billion. This profit level of 11 per cent would be enviable in many developed regions of the world.

Conclusion

There is an old saying, that a glass can be described as either half-empty or half-full. Both descriptions may be statistically accurate, and fully supported by scientific observation, but the former is backwards-looking and pessimistic while the other is forwards-

looking and optimistic.

Dr Tim Kelly is Head of the Strategy and Policy Unit (SPU) at the International Telecommunication Union (ITU), an intergovernmental agency based in Geneva, Switzerland.



Dr. Tim Kelly

The same is true of the phrases "digital divide" and "digital opportunity". The former is accurate, and it is possible to show the persistence of incontrovertible differences in level of access to ICTs, both within Africa and between Africa and the rest of the world. But the latter is more likely to attract the investors, and is more in tune with what is currently happening in the region.

To quote from Benjamin Compaine (The Digital Divide 2001): "My policy recommendation: declare the war against the digital divide won and move on to issues with higher stakes." Although this was written in a different context, it seems to apply very well to Africa. If we choose to focus only on Africa's problems, we will be doing a huge disservice to the men and women who have been busy creating a revolution in the field of ICTs in the last few years. Let's instead focus on Africa's potential, and let us welcome Africa as the newest member to the global Information Society.

Acknowledgements

I wish to thank Lara Srivastava, ICT Policy Analyst at the SPU. The views expressed in this article are those of the author and do not necessarily reflect the opinions of ITU or its membership. For more information on this topic, and for background data, please see "African Telecommunication Indicators" (ITU, 7th edition, May 2004), www.itu.int/ti.

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Fake palm trees holding mobile phone transmission equipment: Zambia
Source: Steve Romaine, GeckoBeach.com



FINANCING TECHNOLOGY: THE NETHERLANDS DEVELOPMENT FINANCE COMPANY

Abstract

The Netherlands Development Finance Company (FMO) supports the private sector in developing countries and emerging markets in Asia, Africa, Latin America and Central and Eastern Europe. It provides loans, guarantees and other investment promotion activities to contribute to the structural and sustainable economic growth by bridging the gap between entrepreneurs and capital.

The Netherlands Development Finance Company (FMO) provides financing solutions and know-how for companies and financial institutions in developing markets. It supports the private sector in Africa by providing loans and risk finance to enterprises investing in Africa, manages special funds focusing on local small and medium-sized enterprises and takes the lead in investments in more high-risk countries and sectors. The goal is to contribute to the structural and sustainable economic growth in Africa *and together with the private sector*, and generates healthy returns through joint activities with the local private sector. These returns make FMO a valuable risk partner. FMO is a joint initiative of the Netherlands Government, Dutch financial institutions, and industry and trade unions. The Dutch development bank supports businesses and financial institutions in developing countries and emerging markets with capital and know-how. It is one of Europe's largest bilateral, private sector oriented development banks.

FMO is a sound financial institution with a Triple-A rating from Standard & Poor's. It has two business units, FMO Finance and FMO Investment Promotion.

FMO Finance extends financing at its own expense and risk and manages special funds with special attention to local small and micro enterprises and pioneering investments in riskier countries.

FMO manages special funds, among others:

- Investment Facility Emerging Markets (IFOM) stimulates the

investment of Dutch SMEs in emerging markets by providing subordinated loans.

- Netherlands Investment Matching Facility (NIMF) provides both long-term risk capital and specific sector expertise.
- Infrastructure Fund for Least Developed Countries (LDC-fund) supports the development and improvement of social-economic infrastructure in LDCs. The fund provides risk capital to catalyze additional private funds for investment in private or public-private infrastructure projects in these countries.
- Financial Sector Development Fund contributes to the improvement of financial services for small businesses, micro entrepreneurs and lower income groups. FMO concentrates on strengthening the financial intermediaries who target these groups in the market.
- FMO Investment Promotion manages programs on behalf of the Dutch government, by providing subsidies grants for capital goods export transactions and technical assistance, facilitating non-commercially viable activities as a way of catalyzing private sector activity.

FMO also manages various Dutch Government funded programmes such as::

- Development-related export transactions programme (ORET/MILIEV): awards grants to developing countries for buying capital goods, services and works from Dutch enterprises.
- Investment Promotion and Technical Assistance to Developing Countries (IPTA-DC): provides grants for feasibility studies, temporary management and technical assistance, and job related training and education, among others.

FMO supports the private sector in Africa by providing loans, financing solutions and know-how to companies and financial institutions

FINANCING TECHNOLOGY: FMO

- **Technical Assistance in Emerging Markets (TAEM):** promotes investments by Dutch SMEs by subsidizing financing knowledge transfer activities supporting an investment, such as temporary management and education, for Dutch SMEs located in Sub-Saharan Africa, Asia, Latin America, and Eastern Europe.

At the end of 2003, FMO's investment portfolio amounted to €1.9 billion of which 77 percent was in countries with low and low-medium levels of income. A little over 40 percent of its portfolio is made up of projects in the financial sector. Other focus sectors are infrastructure including, telecommunications (such as an equity investment of USD 15 million, for telecom operator Celtel to expand its networks in Africa; energy (including an investment of USD 17 million in an energy project in Tanzania); water projects (like water treatment installation in Winneba (in Ghana); and other export industry and trade projects. FMO supports

several microfinance institutions in Africa, for example in Mozambique NovoBanco was established through FMO collaboration in order to improve financial services for small entrepreneurs.

If you have investment plans including plans for a take-over you can solicit support in the form of loans, equity or long-term risk capital. For these and further questions, contact the Africa desk by phone at +31 (0) 70 314 96 13 or send an email to africa@fmo.nl

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BUSHMAIL OVERCOMING DISTANCE



Mr. Justice Malanot
CEO Bushmail

One company that is connecting people in Africa is Bushmail. Bushmail is Email that works via HF Radio in remote Africa. The system is widely used in tourism lodges in locations such as the Okavango Delta and the Serengeti and carries bookings, logistics and personal communication. An annual airtime fee allows an unlimited amount of emails to be sent by the users which turns out to be much cheaper than expensive satellite alternatives.

The drawback of Bushmail is that it is generally slower and a bit trickier to use the first time around –as it works via radio waves, which are bounced across the horizon. The fact that the system is so

much more robust than anything else on the market more than makes up for the limited speed. All you require to send email from anywhere (even a vehicle whilst driving) is a HF radio, modem and HF antenna. Most of the time this means a wire over a tree, 12 Volt batteries and a Laptop plugged into a cigarette lighter.

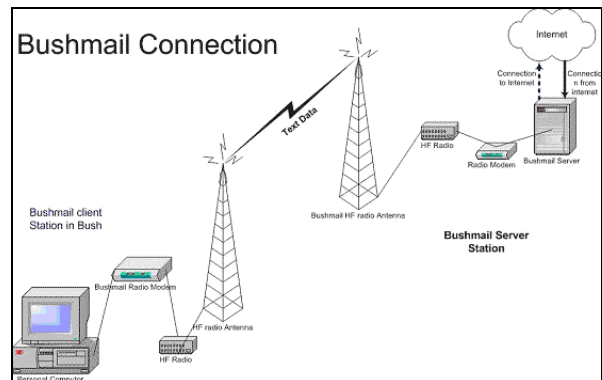
Bushmail is quite rightly called the frontlines of the Internet in Africa as most of its users are pioneer business people in very remote and challenging locations. The recent influx of Pioneer farmers from Zimbabwe and SA into countries that are opening up their agricultural sectors- such as Zambia and Mozambique-has meant that pioneer farmers can access their email even though they are out in the Bush under the tropical convergence zone in the peak rainy season. At \$500 per annum most farmers prefer to have instant contact with their loved ones in the first world and use the system extensively for logistics, orders and marketing purposes year round. The fact that the cost is

fixed means that the person who pays the bills does not have to lock up the system in a safe or keep the teenagers away –as often happens with \$1 a minute satellite phones.

Bushmail employs technology that has been around since World War one and has been in use by Sailors and Yachts from the days of Marconi, the inventor of the wireless radio. Recent improvements in modem technology and the advent of the Internet has meant that the ability to send simple text messages from a remote location in Africa to an Email address globally, or a GSM cell phone anywhere has greatly improved. Bushmail has also had a dramatic impact on the family lives of remote camp managers and lonely “Bush men” and has raised the calibre and frequency of love letters substantially in areas where Snail mail literally could take months. The fact that users are in daily contact with family and loved ones means less time off site on R&R trips in order to battle loneliness which result in substantial cost savings at lodges, mining sites and remote cattle ranches.

Bushmail has been around for 7 years. The successful renewal of African agricultural Industry, the railway system and rural electrification may depend on effective and cheap outside communication through Email in places where GSM towers do not reach and where Telecommunication cost are disproportional to the needs.

For more information on Bushmail www.bushmail.net



THE POCKET IMMUNOASSAY: A POTENTIAL DIAGNOSTIC SYSTEM FOR DEVELOPING COUNTRIES

Information provided by *Robert Benson*

Abstract

To cure diseases doctors need the right diagnosis preferably on time. Thus far Immunoassays such as ELISA are the most reliable and widely used methods for detecting antigens and antibodies, but they are expensive, bulky and time consuming. This hampers it being used in countries that lack electricity, trained personnel or require low-cost or compact equipment. This article describes an integrated approach to a miniaturized immunoassay called a "POCKET immunoassay" which is inexpensive, operable with minimal equipment and technical skills, and shows an analytical performance approaching that of enzyme-linked immunosorbent assays (ELISA) performed in a bench-top format in clinical laboratories.

Technological applications for resource poor communities have to be inexpensive, easy to operate, low maintenance and work with minimal infrastructure support. This is important if the technology has to be deployed widely in areas with limited skilled

resources and far from urban centres. In many cases, it means compromising the quality.

Researchers at Harvard University have developed a miniaturized immunoassay system called the POCKET (portable and cost-effective). The team employed advanced technologies to create an easy to use, battery operated (9V) and cheaper diagnostic system whose level of accuracy is similar to bulky and expensive equipment that require electricity to use.

The POCKET detects disease-induced proteins in the blood sample. The blood contains thousands of different molecules that include molecules produced by our immune system (antibodies) to fight invading organisms such as malaria, tuberculosis and HIV. Detection of these disease-induced proteins in the blood is an indirect way of quickly identifying the organisms responsible for the infection.

Diagnostic systems such as the widely used enzyme-linked immunosorbent assays (ELISA) are based on detection of antibodies. However, ELISA systems are bulky and expensive equipment, and require electricity, lengthy incubation periods and multiple pipetting stages.

The POCKET integrates the immunoassay and detection device in a single unit. The detector consists of a semiconductor laser diode powered by a single 9 volts

battery. The performance of the POCKET is similar to that of ELISA when tested to distinguish HIV infected samples from those not infected. The prototype was assembled at a cost of \$45. It is useful for in-the-field diagnosis and can be handy to highly mobile teams such as the military and flying doctor services.

Currently Harvard University's Office for Technology and Trademark Licensing is negotiating with a start-up firm to commercialize the POCKET. Once the start-up has developed the invention to the point where it can be mass-produced the start-up and/or Harvard have a goal of finding

a partner willing to develop the POCKET device for use in the developing world. Either party could negotiate a non-exclusive license for sale in GAVI (global alliance for vaccines and immunization) countries and a world-wide non-exclusive license for manufacturing.

For further technical details visit our website, <http://www.techtransfer.harvard.edu>.

For commercial interest contact Robert Benson at Robert_benson@harvard.edu or by telephone at 617-496-3830.

THE AFRICAN GROWTH AND OPPORTUNITY ACT

M. Hayashi, L. Roffarello, C. Bartel

A number of African leaders have attributed some upsurge in trade to the African Growth Opportunity Act (AGOA). For example exports from the *Common Market for Eastern and Southern Africa* (COMESA) went up 52 percent from \$456.7 million in 2002 to \$880.5 million in 2003. There have also been some successful cases in the apparel industries in some African countries. The trends of clothing exports from 2000 to 2003 of the AGOA countries showed substantial growth of clothing exports to the US during the period. Except Mauritius, South Africa and Zambia, large part of the clothing exports entered the US under the programme as opposed to the MFN status. However these successes could have more to do with the Special Rule of origin than actual benefits from AGOA. For example, the relatively low rates of AGOA preference utilization rates for Mauritius and South Africa are due to non-application of the "third-country" fabric rule to these countries. Zambia was the only country whose clothing export to the US did not develop.

Rules of origin are the major factor determining whether AGOA would contribute to the development of the local textiles industries. If the rules are strict, i.e.

requiring the use of US fabric and yarns for preferential treatment, the AGOA could discourage the vertical integration of production chains in the region, and the manufacturers could end up assembling low-value added garment. Asian countries have mostly used the special rule that allows countries to import fabrics from third countries. However this rule is applicable only to countries that are categorised by the World Bank as lesser-developed countries (LDCs).

Still successes in export diversification have been minimal, except for a few countries whose governments have actively promoted diversification. Other countries have been slow to exploit AGOA at all. Others, such as Mali, Rwanda, and Senegal, have implemented AGOA-related projects, but have made insignificant gains thus far.

The African Growth Opportunity Act (AGOA) was enacted into law as part of the Trade and Development Act of 2000 in the US. It encompasses 48 African countries which are defined as the Sub-Saharan African countries. The objective is to encourage trade to further economic growth in Sub-Saharan Africa and to help integrate the region into the global economy. Currently 37 countries are eligible with the latest comer being Angola designated on January 1, 2004. On the same date, however, Central

Rules of origin are the major factor determining whether AGOA would contribute to the development of the local textiles industries.

Special Rule of origin: allows use of third country fabric

For example, Mozambique can import fabrics from any country, and still be entitled to export clothes to the US.

African Republic and Eritrea were removed from the list of eligible countries. Last year, petroleum products dominated Sub-Saharan Africa exports to the US under AGOA accounting for 80 per cent of all the AGOA exports. Last year, US Oil imports from sub-Saharan Africa alone were US\$17.9 billion. This is 69.6 per cent of all US purchases.

The first amendments to AGOA, also known as AGOA II, went into law on August 2002 as part of the Trade Act of 2002. AGOA II extended the preferential treatment to knit-to-shape articles or "wholly assembled" apparel articles (previously not eligible), it doubled the apparel cap for apparel made in Africa from regional fabric made with regional yarn (although did not modify that overall cap under the special rule for lesser developed beneficiary) and finally, it also granted Botswana and Namibia the status of AGOA lesser developed beneficiary country thus extending, to their producers, the benefits of the special rule that allows for the use of third country fabrics.

The existence of this special rule, although subject to a cap, is generally viewed as essential for AGOA to be meaningful for its lesser-developed beneficiaries. This rule was bound to expire on 30 September 2004 and the uncertainty regarding its extension was a great concern for both the beneficiary countries and international investors.

On July 12, 2004 the President of the United States signed the AGOA Acceleration Act, or AGOA III. This recent bill extends the AGOA trade benefits, which are currently set to expire in 2008, until 2015, as well as the special rule on the "third-country" fabric rule until September 30, 2007. As in the case of AGOA II, the AGOA III bill does not increase the quota for apparel made under the special rule but retains the same formula used previously (although, in the last year, it is foreseen to phase down the current cap by 50 per cent). In addition, among other provisions, the AGOA III bill makes technical corrections to AGOA rules of origin to allow apparel with components such as collars, cuffs, drawstrings and waistbands sourced outside AGOA countries to receive duty-free benefits. Previously, it was up to customs to decide whether such garments would or would not qualify for such treatment.

While it would be too early to make a conclusive observation with regard these recent amendments, the extension was warranted, inter alia, on clear indications that AGOA has had -owing largely to the special rule- a significant positive effect in increasing clothing exports from the beneficiary countries and, to a certain extent, in attracting investments.

Yet, it is not clear whether the current rules of origin (although revised and made more flexible by AGOA II and III) would be sufficient to promote the integration of the local production chain in the region and to move up to the high value-added production. Some researchers have argued that AGOA rules of origin would increase imports of American textiles to these countries and hinder the development of their textile industries, particularly of cotton based ones. For example, AGOA sets the quota for apparel assembled from non-US fabrics, and this quota was noted as a limitation of AGOA.

Under AGOA, apparel assembled from "third-country" fabric and yarn, as well as those assembled in Sub-Saharan Africa from US or Sub-Saharan African yarn are subject to quantitative restrictions with a limit of 4.68% of total US imports of clothing in 2003 rising to 7% in 2008. The quota is not allocated among countries, but it will be filled on a "first-come, first-served" basis. Within the quota there is a sub-limit on imports under the special rule of origin which allows for global sourcing of fabrics of 2.06% of total US clothing imports. A recent study found that the utilization of the quota has been quite low (*Paul Brenton and Takako Ikezuki*). Between October 2002 and September 2003 the overall quota was 36 % filled. Within this the limit on products subject to the special rule was 62% utilized. The quota on products assembled from regional fabric was less than 10% filled.

The fact that fill rate of quotas for apparel assembled from regional inputs has been quite low so far, suggests that either the local textile industries have not developed as expected, or that they are not sufficiently competitive. The key question for the future of AGOA (and other preferential arrangements) revisions would be how a country benefiting from preferential market access for clothing could move up either vertically or horizontally without being confined to assembling low

value-added garment. The AGOA could be a stepping-stone for further development. Yet, together with the provision of more lenient rules of origin like, for example, those available under the special rules, there is a strong need for appropriate national policy guidance and business strategies, including supply side support measures, if the value of the AGOA is to increase substantially for beneficiary countries.

The fact that African countries are not using fabrics from the US or from the region as expected indicates that this sources of intermediate parts are either not available in the quantity or quality expected or, more plausibly, the preferential margin that is offered to African exporters is not sufficient to compensate for the cost of intermediate parts.

This result should not be surprising because it simply reflects the current dynamics in world trade and economic spe-

cialisation. On the other hand AGOA has only been in place for 3 years. Many countries have been late to implement it. Perhaps more investment in the future will go towards increasing the competitiveness of regional fabrics and intermediate inputs, which is incidentally one of the objectives of AGOA.

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A TALE OF TWO COUNTRIES: ICT STRATEGIES FOR MALAYSIA AND MALI

Abstract

There has been significant debate on the potential of ICTs to facilitate development in developing countries. Yet, there seems to be a divergence in what countries perceive to be the benefits of ICTs. This difference is reflected in their strategic plans, projects and measure of success. Here we provide a summary based on the approach of Malaysia and Mali as told by their senior policy makers.

Malaysia's ICT Strategy

By the mid 1990s, Malaysia lost competitiveness in basic manufacturing to some of its neighbouring countries that could produce similar products cheaply. In order to remain competitive, the government devised a plan to developed projects based on information technology.

In 1996, the Multimedia Super Corridor (MSC) programme, a 15 by 50 km stretch between the international airport in Kuala Lumpur and the city centre, was

launched. Support infrastructure (highways, a new airport) and a new administrative centre was put in place.

The Multimedia MSC hosts more than 900 multinationals, foreign and domestic companies focused on multimedia and communications products, services and research and development. Malaysia's Promotion of Investment Act grants companies MSC Status. *MSC status includes a Pioneer Status that grants 100% exemption from taxable statutory income for a period of 5 years and the Multimedia Development Corporation (MDC) can grant an extension for another 5 years. Additionally, companies can get a 100 percent Investment Tax Allowance for investments made in the first 5 years of the company's operation*

The government worked with global industry leaders to establish what was needed to attract them to invest in IT-related industries. This led to the development of '10 Bills of Guarantees' or promises to companies prepared to invest in the sector, and to qualify for the MSC status. They include: freedom to source capital,

In Malaysia government worked with global industry leaders to establish what was needed to attract them to invest in IT-related industries.

100 per cent foreign ownership, free sourcing of personnel and free movement of capital.

A high-level implementation council, chaired by the Prime Minister, consisting of government and private sector leaders was established.

Qualifying MSC-Status companies that choose to develop innovative multimedia technologies and applications are eligible for R&D grants. All companies that are resident in Malaysia and seeking opportunities for MSC related exports get double deduction on expenses they incur for promotion of exports. The government also guarantees a 48 hours visa processing.

The first phase has been successful and the second phase will extend the programme to other parts of the country. The flagship programme covers tele-health(?), electronic government and smart schools. The Smart School pilot project involved 90 schools. The target is to provide Internet connectivity to 10,000 primary and secondary schools in the country by 2004.

Mali's ICT Strategy

Mali has thousand years of history of knowledge and writing on cultural, economic and social evolution. Today, the government has quickly realised that in certain areas, ICT can permit certain shortcuts. Some examples illustrate the vision and experiences of Mali in ICTs.

A multipurpose community telecentre, sponsored by UNESCO, FAO and others, has been established in the historic city of Timbuktu. Religious leaders, scholars, craftsmen, tourist guides and traders use this service to communicate with clients at home and abroad. The aim is to replicate this experience in other cities and rural areas where there is no market for ICTs.

Timbuktu has some 300,000 old manuscripts, dating from the 9th century A.D. to the present, covering all aspects of society. A project to save and archive these manuscripts has been launched. It is an example where the past meets the future. An institute has gathered about 20,000 manuscripts, with some 700,000 archived pages. These are being scanned and saved in databases that will be available online.

Similarly, Swisscom (Switzerland) and the Lycée School of Timbuktu have developed a project that allows students in Timbuktu to collaborate, exchange and work with students from a Swiss school.

In health, a tele-medicine project between the University of Bamako and the University Hospital in Geneva, Switzerland, has been developed. They exchange technologies and experiences on tropical diseases. Another project in health allows radiologists to compress data and send it to Bamako, where specialists can interpret the information and send back their diagnosis by e-mail to local clinics.

These examples illustrate that our vision to use new ICT uniquely as a tool for development.

Discussion

The approaches adopted by the two countries are very different. The difference cannot be fully explained by difference in national wealth or human resource availability. The Malaysian approaches places emphasis on industry participation while that of Mali is centred on donors (public or private). Secondly, Malaysia sees ICTs as critical to competitiveness at all levels (governance, production and services) while that of Mali approaches ICTs as another means of communications and storage. The level of commitment and what is seen as or termed "successful" by the two countries are very different in both cases. Another contrast is the prominence given to the ICT sector. In Malaysia, the Prime Minister Chairs the high-level ICT team to ensure the project is working but that is not the case for Mali. In Mali a community telecenter, scanning documents and collaboration is a success.

Mali's experience is not unique in Africa. Most countries in Africa are not providing support to the young but quickly growing local ICT industry. (For example, countries have been complaining of lack of skilled manpower since the 1980s. If they provided training, they would have produced millions of graduates. They should assist local industries to source capital, import machineries and intermediate goods and engage them in developing national development plans.

Source:

1 and 2 based on ICT4D as told by Leo Moggie, Malaysian Minister of Energy, Communications and Multimedia and Mamadou Diallo, Chief of Mission of Informatics and ICTs, Ministry of Communication and New Information Technologies

Discussion by ATDF

.....our vision is
to use ICT
uniquely as a tool
for development.

Mamadou Diallo,
Chief of Mission
of
Informatics and
ICTs

SATELLITE APPLICATION CENTER: AFRICA IN THE SKIES

The Satellite Applications Centre is a business unit of the South African Centre for Scientific and Industrial Research (CSIR) focussing on remote sensing and geo-information products and solutions, Telemetry Tracking and Command (TT&C) provision and engineering support. SAC is ideally geographically positioned as a centre for Tracking, Telemetry and Command (TT&C) for geo-synchronous, polar orbiting and scientific spacecraft.

Capacity Building

SAC capacity building in curriculum development relevant to space science and earth observation in partnership with stakeholders and tertiary educational institutions and image interpretation for development, safety and security. It also delivers training courses and applications development for students from other African countries. The intensive training programme at SAC includes satellite telemetry, tracking and command as well as skills in the use of applying the images that will be captured from the satellite to real world problems.

For example SAC has trained Nigerian engineers and scientists involved in the Nigerian satellite programme at the CSIR Satellite Applications Centre (SAC). The training is part of the bilateral agreement between Nigeria and South Africa. NigerSat 1, the first wholly owned Nigerian satellite was launched in 2003. This made Nigeria the third African nation, after South Africa and Algeria, to launch a satellite into space. The Nigerian government - through its Federal Ministry of Science and Technology - regards the NigerSat 1 project as an opportunity to jump-start a beneficial space programme for Nigeria. "It is a technology that would help in the management of land, air and water resources. It also deals with meteorological factors, the study of atmospheric and weather sciences, using satellite data to facilitate the effective management of the environment.

SAC has over 40 years of experience in TT&C support and has served international agencies and firms such as NASA, the French Space Agency (CNES), Boeing and Hughes among others. It has a staff of over 70. SAC currently operates antenna systems in the L, S, C, X, Ku and DBS bands and is an affiliate member of the Committee on Earth Observation Satellites and an observer agency of CCSDS, participating in Panel 3. These engagements keep SAC at the forefront of technology and up to date with all issues related to protocols, cross-support and inter-operability.

Excellence and achievements

The culture of quality and business excellence at SAC was rewarded when the South African Excellence Foundation (SAEF) named SAC the winner of the 1999 SAEF deployment excellence prize, the equivalent of the Malcolm Baldrige National Quality Award in the USA. Since 1980, SAC has provided launch and orbital support for all CNES space missions within its coverage, including missions for other agencies supported by CNES such as the NASA/DOD Clementine project, the IRS 1-C critical manoeuvres, the Lockheed Martin Launch Vehicle and the Ariane-5. Since 1982 more than 100 successful launch support operations have been performed (mostly for Ariane 4), while TT&C supports have been provided on a continuous basis for polar orbiting and geostationary satellites.

In October 1997, SAC won a competitive bid for a long-term contract with Hughes Space and Communications (HSC) to provide Transfer Orbit Services (TOS) in the DBS/Ku bands. SAC has upgraded its facilities with a new 13.2m antenna system that is now fully operational and has successfully completed several mission supports. In 1999, SAC won a further long-term contract with CNES for Ku/DBS band services.

Track record

A rigorous technical process and thorough understanding of the business and TT&C operations has been a landmark of SAC's 100% success record.

SAC supported Afristar, Asiastar, Helios-1B, Helios-1A, Spot-4, Clementine, Hotbird-2, Hotbird-3, Hotbird-4, Hotbird-5, Hispasat-1A, SWAS, Hispasat-1C, TC2-A, TC2-B, TC2-D, TC1-C, TC2-C, TDF-1, TDF-2, SJ5, LEWIS, Sirius-2, IRS-1C, SZ-1S, SZ-2, Hispasat-1D, Bonum-1, JCSAT-6 (backup only), Astra-2A (backup only), Sirius-3, Eutelsat W1, Atlantic Bird-2, Eurasiasat-2, PAS-1R, PAS-10, DTV-1R, DTV-4S.

Experience

SAC has gained valuable experience in successfully implementing TT&C support projects involving upgrading of facilities, interfacing existing capabilities with customer furnished equipment, setting up data communications links, and training operations teams for new support and services. SAC has the capabilities and facilities to support any ground segment requirements, from the establishment of an antenna facility to operations and maintenance. The Ground Segment Establishment (GSE) unit at SAC performs upgrading or modi-

SAC MANAGING THE SKIES

fication of ground facilities and that of antenna systems to meet specific mission requirements. The list of satisfied customers includes, Boeing Satellite Systems (12m XM Radio antenna, 13m Ka band antenna), CNES (Stentor, Argos, Euridis, Doris and other projects), Eutelsat (6 Ku band antenna for remote spectrum monitoring), Intelsat (Remote Spectrum monitoring system), Europestar (3.8m Ku band antenna for payload monitoring) and Boeing launch Vehicles (2.4m Ku band uplink system).

Site location and security

SAC owns 4000 hectares of land with a 28 hectare antenna farm at the current site, located approximately 90km west of Pretoria and 60km north of Johannesburg or latitude 25° 53' South, longitude 27° 42' East. The site is located on the Magaliesburg mountain range, 1530m above sea level.

SAC is classified as a National Key Point, and therefore benefits from priority security support. Guards and security cameras monitor the site 24 hours per day. The site perimeter fence comprises of two parallel 3-metre high wire fences, with an infrared neural-network based beam detection system monitoring the 3-metre gap in between. This system is built by the CSIR and has been installed at international key points eg. NATO air base in Turkey.

Data Communications

The station is connected to the Telkom Earth Station by an 8 MBPS fibre optic cable ducted 2 metres under the ground. This cable is part of the National Fibre Optic Network to which Telkom gives the highest priority whenever maintenance is required. Telkom provides a National Data Network Management Node on SAC premises for real time monitoring and control of data circuits. In addition, the station has all the modern communication systems backed up by dedicated cellular phones for TT&C voice and fax lines, independent from SAC's power sources and the fibre optic connection.

Technology for Development

The Centre for Scientific and Industrial Research (CSIR) contributes to the empowerment of the disadvantaged in South Africa and the region through appropriate technology-driven sustainable socio-economic development. The CSIR Technology for Development (TfD) programme mobilises resources into selected projects in partner communities.

The premium has been on generating and capturing learning which can then be made available to other parties, which have the ability to replicate on the requisite scale for necessary impact. The outcome of Technology for Development programme is to impact on job and wealth creation, contribute to black economic empowerment, contribute to poverty alleviation and eradication, increase access to basic services such as housing and water, reduce food and water insecurity, develop human resources and support sustainable development. For example activities that focus on food security involves the facilitation of multidisciplinary research to develop an in-depth understanding of the strategies upon which the poor base their livelihoods and the role that science and technology can play to enhance those strategies.

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SAC delivers training courses and applications development for students from other African countries.

ICT4D CONNECTING PEOPLE FOR A BETTER WORLD

Information and communication technologies (ICT) have dramatically changed the way individuals, organisations and enterprises do business. But are they a priority for development cooperation, empowerment and poverty reduction? key innovators, government leaders, development experts, grass-roots practitioners and leading CEOs offer new and often unexpected answers to this and other questions. In addition, readers of "ICT4D – Connecting People for a Better World" will find a wealth of information related to concrete implementation of ICT for development projects.

The book brings together more than 60 leading representatives from international organisations, national governments, civil society, business and research. With a focus on the human and implementation dimension, they discuss the potential and limits of information and communication technologies for development (ICT4D) sharing their considerable knowledge and insight with a wider audience. As a result, the book not only provides an excellent overview of the actual state of the international debate but also identifies critical areas of ICT4D which have yet to be fully addressed.

Among the many contributors are such well-known experts, visionaries and practitioners as M.S. Swaminathan, one of the "fathers" of the green revolution in India and a leading ICT4D pioneer, Shashi Tharoor, UN Under-Secretary-General for Communications and Public Information, Paula Lehtomäki, Finland's Minister of Foreign Trade and Development, Tengku M.A. Shariffadeen a key player in Malaysia's highly successful ICT strategy, and Maria Cattau, Secretary-General of the International Chamber of Commerce (ICC).

The book has five chapters, each devoted to an important aspect of ICT4D, such as "access", "policy and implementation", "human capacity and empowerment", "communication for development", "local content". An additional three chapters deal with overarching themes such as "multi-stakeholder partnerships", "poverty

reduction" and "financing mechanisms". They are preceded by an introductory chapter providing a state-of-the-art overview from a development perspective. The author firmly places the role of ICT4D in its overall historical, political and development context and identifies important trends and future developments.

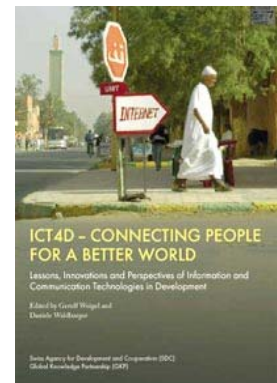
"ICT4D – Connecting People for a Better World" thus serves both as a starting point for readers new to the field, as well as a must-read for those already familiar with ICT4D who want to be kept up to date on the on-going debate. Both groups will particularly appreciate the lists of practical toolkits, web resources and publications at the end of each chapter. The biographical section lists close to 100 people thus virtually providing a "Who's who?" of ICT for development.

The book leaves little doubt that computers, mobile phones, radio, TV, video and the Internet are indeed powerful tools that can make development effective on a large scale for disadvantaged people. This is summed up by Gerolf Weigel, one of the book's editors: "The issue is whether we accept that the poor should, besides being deprived of income, food, health services etc., also miss out on new opportunities to improve their livelihood. The strategic choice is whether to accept the rapidly growing gap caused by a very asymmetric architecture of opportunities or whether to use ICT in a creative manner to level the playing field in economic, social, cultural and political terms."

ICT4D - Connecting People for a Better World, Lessons, Innovations and Perspectives of Information and Communication Technologies in Development; Edited by Gerolf Weigel and Daniele Waldburger; Swiss Agency for Development and Cooperation / Global Knowledge Partnership, Berne 2004, CHF 28.-

The book can be ordered at: www.docudisp.ch/en/bestsellers.php . Further information is available from ICT4D Division of SDC ict4d@deza.admin.ch.

The lists of references and practical toolkits provided at the end of the "ICT4D Today" and thematic chapters, will be further expanded and updated in the online version of this book at www.globalknowledge.org/ict4d .



The book addresses the potential and limits of ICTs, provides an excellent overview of the actual state of the debate and identifies critical areas to be addressed

THE BUDDING INFORMATION TECHNOLOGY SECTOR IN TUNISIA

Abstract

Tunisia has developed and put in place ICT policies, programmes and projects, including infrastructure, education and science and business development support. It has also created an environment for supplementary ICT initiatives driven by various non-governmental stakeholders. The government did identify and outlined the future challenges it is facing as regards its ICT development agenda in its Tenth Plan, covering the period 2002–2006.

Tunisia presents a unique example of a country that have taken significant strides to industrialize and diversify its economy. Its manufacturing sector exports have increased at an annual growth rate of about 20%. Concurrently, the Information and Communication Technologies (ICTs) sector in Tunisia has witnessed an increase in turnover of 260 per cent in software and IT services between 1997 and 2001. The progressive liberalization of the market for mobile communication is bearing fruit. The costs for mobile phone calls are significantly lower than in most other Arab countries and since the entry of the second mobile phone provider – Tunisiana, a subsidiary of Orascom, there has been a marked increase in the number of mobile phone subscribers.

Government policies

Tunisian government policies are geared towards enhancing the ICT infrastructure and providing finance, upgrading skills and education. Emphasis is put on cooperation and partnerships among Tunisian firms or with foreign companies. This would support innovation since joint efforts and complementary skills would reduce investment risks related to innovation.

The government has also established legal texts regulating the ICT sector including a postal code (1998), a law of commerce and electronic signatures (2000), the regulation of a technological pole (2001) and a telecommunications code (2001). This has significantly assisted the management of the ICT economy. However, partnerships present a

very specific management challenge and would require a stronger engagement in the development of management skills for the coordination of partnerships, inter-firm processes and decision-making procedures (Mansour, 2003).

The ICT sector is divided in two main categories.

1. Software development and software engineering services, such as software customization and integration, IT consulting, web development, and translation; and
2. IT-based services, such as database management, data mining, data conversion, and data extraction.

Public ICT producers such as the Centre National de l'Informatique (CNI) are the principal rivals of private software and IT service companies. 80 per cent of software development for the public sector and public administration is carried out by CNI. In the domestic and export markets, the Centre des Etudes et Recherche en Télécommunication (CERT) is active in the field of IT services and software development. It supplies and supports public administration and firms in the public sector. Private software and IT service companies have expressed their concern about the dominance by CNI and CERT markets.

ICT Providers and infrastructure

Tunisia has two main providers of mobile telecommunications, Tunisiana and Tunisie Telecom, offering GSM service in the 900 MHz band and 12 Internet service providers (ISPs) with an international transfer rate of 152 Mbits/s. Other mobile telecommunications providers include local players like TMI and BFI and multinationals including Ericsson, Alcatel, and Siemens. The public ISPs address specific needs, such as the Internet bandwidth of different institutions. For example, the Réseau National de Santé (RNS) connects hospitals and the Réseau National de Recherche et de Technologie (RNRT) connects research institutions. The five major private ISPs are Planet Tunisie, 3S Global Net, HexaByte, Tunet

Tunisia has witnessed an increase in turnover of 260 per cent in software and IT services between 1997 and 2001.

and Topnet. In addition, there are so-called Publinets, publicly supported Internet access points across the country. There were 305 Publinets in 2004 (ATI, 2004). These developments increase competition and hence provide greater affordability and access to the Internet.

Tunisia now has a modern communications network with an Internet network that covers the entire country. Between 1997 and 2001, the Tunisian Government invested about US\$ 1 billion in ICT infrastructure, including telephone networks, Internet backbone, and other digital communication networks. By 2006 it should have invested another US\$ 2.1 billion. Estimates for 2006 are as high as 3,000,000 compared to 503,900 mobile phone subscribers in 2002. At the present, there are about 2.15 computers for every 100 Tunisians. The "Family PC" Programme aims to increase the number of home computers in Tunisia by offering low interest rates for the purchase of a computer and printer.

ISET'Com has been establishing enterprise incubators in order to promote entrepreneurship in the ICT sector, by linking research, higher education and financial support. One major project is the technopole Elgazala in Ariana, created in 1999. By 2003, the number of Tunisian and foreign firms located in the park had increased to 40, with about 520 engineers and has established partnerships with technopoles in Bari (Italy) and Sophia Antipolis and Marseille (France). Similar technopole projects about to be launched include Sakiet Ezzit in Sfax and Hammam Maarouf in Sousse.

Challenges and opportunities

Tunisia's main challenge is to create optimal conditions for rapid and sustainable growth of the IT sector. There is need to address the structure of spending, the revenues of firms (returns per investment) and public investment. Only twenty-three per cent of the overall turnover generated by ICT companies relate to exports compared to 77 per cent from the domestic market. 29 per cent of software and IT service companies did not export at all. This share is expected to decrease to 6 per cent, as firms are increasingly trying to extend their business in export markets. In the future, up to 94 per cent of all software and IT service companies will partly or exclusively serve foreign markets.

Strengths	Weaknesses
Exemplary legislative and regulatory framework, particularly in electronic commerce.	The size of businesses in the ICT sector, mainly small and medium sized enterprises, limiting sector based synergies.
Balanced basic telecommunications network that could gain from being reinforced, particularly the internet and mobile phones.	Costs are still too high for international communication and high bandwidth (ADSL, leased lines, etc).
Elite graduates, probably the best in the region, but still too few.	Shortage of venture capital for enterprises specialized in ITC.

The overall public budget for hardware, software and IT services is projected to increase from US\$ 664.6 million for the period from 1997 to 2001, to US\$ 1.3 billion between 2002 to 2006. The Government budget for software and IT services is estimated to increase annually at 18.6 per cent (2002 - 2006) compared to that of hardware (12.3 per cent).

Exports and growth

Increased investment has let to an overall turnover of the ICT sector. Software and services grew steadily making them important growth areas in the sector. Tunisia's main export countries include France, Germany, Spain, Italy, the United Kingdom, the United States, Canada, Algeria, Morocco, the Libyan Arab Jamahiriya, Mauritania, Mali, Rwanda, Cameroon, South Africa, the United Arab Emirates and Oman.

The Government estimates turnover of software and IT service companies to grow at an average annual rate of 42.5 per cent, from US\$ 58.3 million in 2002 to US\$ 477.2 million in 2006. The average growth of other industrial sectors in Tunisia is put at 5.7 per cent. As a result, the share of software and IT services in the gross domestic product (GDP) is projected to increase significantly, from 0.27 per cent in 2002 to 1.5 per cent in 2006.

The key inputs and determinants of growth in the ICT sector are human resources, capital, ICT infrastructure, and science and research. The number of graduates in IT-related areas is projected to increase from 1,900 in 2002 to 5,000 in 2005. Given Tunisia's high standards of education, the quality and quantity of personnel is guaranteed. If the sector

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ICT SECTOR IN TUNISIA

	1990	2002
Tunisia's GDP (\$ billions)	15,5	20
Total exports merchandise (\$ billions)	3.5	6.8
Share of manufacturing sector (%)	69.1	80.7
Total exports Services (\$ billions)	1.7	2.7

Investment

Risk capital is an important prerequisite for innovation and business development. For this the government of Tunisia supports a number of public venture capital initiatives. For example, the Régime d'Incitation à l'Innovation dans les Technologies de l'Information (RITI) offers ICT firms the possibility of participating in projects related to research and development (R&D). Another source of venture capital is the Tunis Information Technology Fund (TITF). Yet investments and project financing continuous to be an obstacle for software and IT service companies because risk capital is still scarce.

Some funds such as the Fonds d'Accès aux Marchés d'Exportation (FAMEX) concentrate on the promotion of exports across all economic sectors. FAMEX was established in collaboration with the World Bank. The fund covers up to 50 per cent of marketing consulting costs and business travel. The collaboration with FAMEX includes intensive management consultancy for the company, which transfers the expertise of the fund to the new export business. The Fonds de Promotion et Développement d'Exportation (FOPRODEX) is also an export promotion fund, which covers 15–50 per cent of costs for certain activities undertaken by a company, such as participation in trade fairs and certain kinds of advertising material.

The main objectives of the funds are to reduce market access barriers as it per-

mits companies to market products abroad with less financial effort. The government hopes that in the long term, companies may be able to approach the market without the support of the funds.

Internationalization

Tunisia offers partnership opportunities for foreign firms in the sectors of mobile cellular phones, the wireless market, short messaging services (SMS), and industrial messaging services. The main competitors for Tunisian IT exporters are from Eastern European countries and Morocco (ITC, 2004). Tunisia also faces competition from companies located in Western Europe and, companies from North Africa and Arab countries that are entering the local market. Over half of the companies target the financial services and public administration industries.

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Conference Announcement

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13 - 19 March 2005

Global Conference on
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Traditional Medicine
Johannesburg, South Africa
16 - 18 March 2005

Global Forum on Bioethics in
Research VI
Blantyre, Malawi
17 - 19 March 2005

Traditional Healing & HIV/
AIDS
Dakar, Senegal
11 - 13 April 2005

Fifth International Triple Helix
Conference
Turin, Italy
18 - 21 May 2005

Improving Quality of Care:
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30 May - 10 June 2005

12th International Product
Development Management
Conference
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TRADE IN TELECOMMUNICATION SERVICES

The telecommunications services industry is worth over half a trillion dollars per year, and the global trade in services is rapidly growing. This is forcing WTO members to take another look at the rules on trade in services. In Africa though, out of 51 countries where information is available, 28 saw a fall in their services share of the GDP during the period of 1990-2001, while three remained unchanged.

In 1997 sixty-nine governments that incidentally make up 90% of telecommunications revenue worldwide as well as forty developing countries signed an agreement to liberalize the world telecommunications market. The GATS agreement allows countries to select the sectors that they wish to liberalize. They can also indicate how long the liberalization process would take. The agreement makes it possible to reverse the liberalization process as long as firms that may be affected are compensated for any losses by the host country. There are two exceptions though: services provided to the public in the exercise of governmental authority, and, in the air transport sector, traffic rights and all services directly related to the exercise of traffic rights are not subject to liberalization.

Telecommunications services sector have the potential to contribute to economic growth and social development. It is also a key input in determining the productivity of other industrial and service sectors. However unlike goods, which can be built by a company in one continent and shipped to another to be stored until sold, telecommunications services require direct and simultaneous interaction between the service producer and the service consumer. Telecommunications and services in general depend on infrastructure, which is not mobile across borders. Therefore service providers need access to existing infrastructure on a fair and non-discriminatory basis. For example, if Uganda Telecom wants to sell long-distance telephone service to consumers in Ghana, it must either build the network linking the two parties who want to talk to each other, or buy access to the network already established. Consumers in both countries must have continuous access to the network so that caller, receiver and

supplier can simultaneously interact, allowing the call to go through.

Countries with strong telecommunications services industry want to gain better access to international markets while countries without such an industry are not convinced that it is in their best interest to liberalize their service sectors. Yet many developing countries are already opening their markets in order to benefit from lower prices, new investment and better service brought about by liberalization. The GATS telecommunications agreement or 'Fourth Protocol,' was mainly used by countries to promote the liberalization of trade in telecommunications services as a response to growing demands for cheaper and efficient telecom services and to facilitate trade and investment by opening markets and taking advantage of new technological and market innovations to enhance the flow of information. In the future, attention will probably focus on new markets and technologies that are not covered in earlier negotiations. These include the integration of telecommunication services; new types of services providers and transmission technologies that make it hard to distinguish between sub-sectors.

Key features The telecommunications services industry

- Fast-growing services sector, driven by new technology, with a turnover of £19 billion and employing about 200,000.
- The regulatory framework is crucial and liberalisation in the EU and elsewhere offers opportunities.
- Sector is global and fiercely competitive.
- All businesses depend on effective communications.
- The US dominates the world market.

Key Challenges

- Telecommunications markets are rapidly globalising, with ever-quicker technology change. Moreover, telecommunications, information technology and broadcasting technologies and markets are drawing ever closer together.
- The pace of this change is set to increase with the liberalisation of the EU and global telecommunications markets.
- This is stimulating innovative responses from the industry, with key players increasingly looking to build global alliances.

Developing countries have shown a preference towards commitments that facilitate commercial presence by foreign firms. They are making commitments to open their telecommunications sector by indicating how open the sector will be. This determines foreign firms' ability to establish a commercial presence in the country and/or sell telecommunication services, both domestically and across borders (TESS briefing series). Some countries though are hesitant to open up their markets to the cross-border supply of telecommunications services over which governments could not exercise regulatory control. Rather than 'giving up' something by binding themselves to liberalized telecommunications sectors, they view their liberalization commitments as a means to attract investment, increase export opportunities and facilitate economic development.

Some are calling African countries to take a gradual approach to liberalization because they argue that regulatory capacity in Africa is impeding the benefits of liberalization. Developed countries are likely to accept that African countries adopt a gradual programme of liberalization if they formulate clear policies that justify their developmental agenda. In this regard, African countries could link their pre-commitments to reform in the GATS to targets in Capacity building. This would directly link the promises of developed countries to build capacity in developing countries to undertake service liberalization in the telecommunications sector.

In the context of the Doha Development Agenda, the outcome of services negotiations should ensure better prospects for developing countries to benefit from trade liberalization. Service trade liberalization will help overcome poverty only to the extent policy space is preserved in the international trading system for service suppliers from developing countries.

There is growing concern that services are failing to deliver in developing countries, especially in areas with strong social content such as cultural services, education and health. Other areas of concern include fostering competitive supply capacities in developing countries, especially in business services and physical infrastructure and network services, such as energy, transportation and telecommunications. Achieving competitiveness in these infrastructure services and ensuring affordability and universal access to essential services are among the keys to

The GATS agreement identifies two categories of telecommunications services

1. Private and public telecommunications that involves end-to-end transmission of information, such as voice and data transmission (both fixed line and wireless), facsimiles and paging;
2. Telecommunication services that add value to customers' information by enhancing form or content or by providing storage and retrieval, including on-line data exchange and management, e-mail and voice mail.

success. They are likely to determine how effective developing countries will be in their integration into the international trading system, and how development gains could be transferred to the populations at large.

Source:

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Conference Announcement

The International Dairy Federation (IDF) Dairy Science and Technology Week "Innovation through Innovation"
28 February – 3 March 2005
Maddingley Hall, Cambridge, UK

IAMOT 14th International Conference on Management of Technology in Vienna, in collaboration with UNIDO
May 22-26, 2005

International Conference on Agricultural Research for Development
European Responses to Changing Global Needs
27–29 April 2005,

International workshop on community level adaptation to climate change
Dhaka, Bangladesh
16 - 18 January 2005

Technologies and Applications of Genomics, Proteomics and Bioinformatics
Dubai, United Arab Emirates
25 - 29 January 2005

Science: Practitioners Dialogue on Science and Technology for Sustainable Development
Washington DC, United States
18 February 2005

The burden of diseases in poor resource countries: meeting the challenges of combating HIV/AIDS, tuberculosis and malaria
Arusha, Tanzania
21 - 24 February 2005

The role of biotechnology for characterisation and conservation of crop, forestry, animal and fishery genetic resources
Turin, Italy
5 - 7 March 2005

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