

# Information Systems and Technology in South Africa

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## INTRODUCTION

South Africa, like most of its African neighbors, has a dual economy that sees formal and informal trading taking place side by side. Walking down many of the main streets of South African cities, one can immediately see the informal traders conducting their trade on the doorsteps of established retailers. Many of the formal traders complain about the informal activity and its impact on their businesses. However, there seems to be a symbiotic relationship that ensures their peaceful coexistence. For many foreigners, there is the perception that South Africa is a jungle with lions and tigers running around the streets and wind-up telephones as a means of communication. This is, however, far from the reality. Technology in the formal economy is almost as good as and sometimes better than it is in the United States and other first-world countries. Cellular telephone technology is one generation ahead of the United States. However, like the economy, a technology divide exists, where some parts of the population have access to technology, while others do not. This article will examine the trends in technology, outlining the use of technology in South African industry. The digital divide will also be discussed, looking at the problems and how the State in partnership with the private sector can bridge the gap.

## BACKGROUND

Technology has always been existent in South Africa. However, it has never kept pace with the developments in first-world countries. During the apartheid era, trade sanctions resulted in extremely high costs in acquiring technology, and as such, South African organisations were unable to keep pace with the latest developments in technology in developed countries. However, at present, organisations are capable of implementing the latest systems and technologies as they roll off the production line, as is evidenced by the following scenarios.

## The Private Sector

### Manufacturing

According to Hodge and Miller (1997), the manufacturing sector spent about R900 million on hardware and a billion Rand on software. In order to improve productivity and manage costs more effectively, manufacturers rely heavily on MRP (materials requirements planning) software (Faull, 1995). Toyota South Africa has one of the most technologically advanced production lines in the country. SAPREF (South African Petroleum Refiners) monitors and controls the entire petroleum refining process from a centralized control room.

### Retail

The retail industry has seen an evolution of systems from the basic adding machine to the latest in scanning and optical character recognition systems. Companies such as Pick 'n Pay use their point-of-sale systems not only for calculating and receiving payments but also for EFTPOS (electronic funds transfer at point of sale). Pick 'n Pay is linked electronically to almost all South African banks, allowing customers to draw cash and make account payments to third parties at the supermarket cashier.

### Banking

According to the Reserve Bank, the banks and financial services sector spends almost as much on technology as the manufacturing sector. SASWITCH was introduced in the 1980s and linked the various institutions' ATMs (automated teller machines) on a single network, allowing customers to use any bank's ATM to access their accounts at another bank. Standard banks were among the pioneers to offer electronic account payments from an ATM. They also formed a relationship with MTN (a cellphone network operator) to allow customers to top up

their cell phone airtime from an ATM. All the banks offer Internet banking facilities. Investment houses such as Old Mutual, Sanlam, and Liberty have Web sites where the customer can view his or her investment portfolios, check exchange rates, and conduct secure transactions.

Banks have been moving steadily in developing their offerings electronically, with a long-term vision of reducing branches and services by developing self-service centres. Reducing branches and staff would lower overheads, allowing the banks to become lower-cost providers and enabling them to become more profitable and competitive.

## Telephony

Telkom is South Africa's sole provider of fixed-line telecommunications. Most of South Africa was connected via copper wire. However, in 1981, fibre optic was introduced in the then Transvaal. Beltel, a text-based service, was introduced in 1986, allowing subscribers to gain access to banks, entertainment, adult entertainment, and static text-based advertisements. ISDN was introduced in 1994, and the first cellular phone networks were introduced (Highlights of the..., 2004). MTN, Vodacom, and Cell-C are the only cellular service providers. Apart from providing voice communications, they also offer WAP (wireless application protocol), GPRS (general packet radio service), SMS (short message service), and MMS (multimedia messaging service). The cellular phone industry is extremely advanced and also offers value-added services, such as mobile banking. The advances in telephony have come about due to the lifting of trade sanctions imposed during the apartheid era. Accessing the latest technologies from foreign developers as they unfold is much easier than in the past. South African companies have also chosen, in some spheres, to leapfrog certain intermediate developments in technology rather than gradually evolve from one technology to the next. This is why, in certain areas of technology, South Africa is ahead of some Western countries.

However, according to Weidemann (2004a), South Africa is losing its role as Africa's technology leader due to its restrictive information and communications technology (ICT) legislation. He goes on further to state that legislation is affecting new technologies, such as voiceover Internet protocol (VOIP) and wireless fidelity (WIFI). South Africa has been active in attracting international call centres to its shores. However, according to Jones (2004), because of the prohibitively high costs of fibre optic based communication, providers want to use VOIP, which would drive tariffs down and allow South Africa to compete with call centre hubs in India.

Videoconferencing came into being in 1991, and today, 80% of the top 500 companies in the country use it

(Weidemann, 2004b). Videoconferencing is being used extensively for meetings across provinces, e-learning and training, and, more recently, for conducting interviews, saving on travel and accommodation costs. The University of Kwazulu Natal uses videoconferencing to conduct meetings across its five campuses.

## The Public Sector

Unlike the private sector, the public sector has trailed significantly behind with regard to technology implementation and technology usage. According to Hodge and Miller (1997), it was estimated that seven in 100 government employees had access to computers; this figure has hardly changed, with approximately 16 in 100 employees having access to a PC (Source Withheld). The Home Affairs department that handles birth, identification, travel, and death documents does not have PCs at the counters. Information is recorded manually in books, causing long delays in the event of a query. Furthermore, there is no document management system to track documents sent from regional offices to national offices and vice versa.

In order to improve IT skills, usage, and backup service, SITA, the State Information Technology Agency, was set up as an "outsourcer" organisation to ensure that proper procedures were developed and implemented in procuring IT, providing end user support, and training, developing, and maintaining information systems. However, there are departments that believe that SITA has not delivered on its mandate due to its being an organ of the State. It is believed that SITA has only benefited central government officers and offices, whereas provincial departments do not enjoy the same service delivery, and local and municipal governments are totally excluded.

Although there are departments that have inadequate information technology (IT) and information systems (IS), there are others that have very sophisticated systems. NATIS (national traffic information system) is a database of all driver details and records of road offences. Traffic officers on the street, armed with laptops can access the database and determine if someone who has been stopped has previous unpaid fines or active warrants of arrest. The Prince Alfred Luthuli Hospital in Durban is the first paperless hospital in the country. All records are stored electronically and can be easily accessed, ensuring proper patient care and administration of medication. The Prince Alfred Luthuli project will be used as a case study and benchmark for the conversion of other state hospitals to paperless institutions.

The use of technology in education displays a digital divide of its own. Public primary and secondary schools use outdated technologies for administration and teaching, such as pentium® 1 computers and software such as

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