The Potential Uses of ICTs

ICT applications are useful in numerous instances to facilitate the developments of various aspects of the society. This section will rely on Mansell and When, (1998: chapter 5), to examine some of these aspects:

**Facilitating public and private sector activities in areas such as in:**

**Public Administration**

Public administration is a key aspect of civil society and it includes a range of services to citizens and industry. It provides various functions that enhance the social, economic and political developments of the citizenry. Most importantly, it provides public information that is useful to the community at large. ICTs facilitate these public administration activities. For instance, e-Government, a concept that defines a situation where government activities and public information can be made available using ICTs. In South Africa the government has expressed the intention of transforming itself into an e-government where information can be accessed at any time by phone or by Internet, with public Internet kiosks provided for universal access. These kiosks are called the Public Information Terminals and there are 300 public information terminals (PIT) installed at post offices around the country. The South African Minister of Communication notes that:

_The Public Information Terminal, or PIT, entails the installation of Internet kiosks in post offices around the country. The kiosks will provide instant access to the Internet, e-mail, government and educational services as well as e-commerce. The link to government websites, for example, will provide information on aspects of regulation, legislation, welfare, support, grants and rebates. Interactive directories of various tertiary institutions will also be available_ (Matsepe-Casaburri, 2000).

The PIT is a practical example of how ICT can be used in public administration.

**Urban and Rural Development**

ICT applications are useful in facilitating development programmes in many countries. These technologies help in supporting economic and social developments. Mansell &Wehn (1998: 83) note that "diverse current and historical data sets on health, education, water supplies, sanitation, and population growth and movement can be captured, collated, manipulated, and presented" They also note that "economic development can be fostered by tele-working and tele-services in some of the developing countries" (ibid.). The establishment of telecentres in rural communities can facilitate economic empowerment. Mobile telephony can also help rural entrepreneurs in keeping in touch with their market outside their communities.
Transport

In the transport sector, ICT applications can be used to improve road, air and rail transportation. ICT applications are noticeable in the air transport control, monitoring of freight and the day-to-day transport system. For example, the development of smart cards helps facilitate the smooth operations of the transport system. These operations include payment for parking metres, identification of authorized parking space occupants. In Africa the smart card system is not widely used, however, in South Africa the smart cards used to ease the hassles of boarding public transportation. For example, the SABTA (South Africa Black Taxi Association) trial application in Bloemfontein was to address the growing demand for prepayment services. Minibus taxis are the preferred mode of transport between the townships and places of work in South Africa. These taxis are licensed to carry up to 14 passengers. The Taxi proprietors were pleased with the tighter controls the system offers and more especially that it reduced the risk of loss of cash in the system (Townsend, 1996). Currently, some Taxi operators are using the smart card system.
ICT applications are becoming valuable resources in the medical field. They support efficient exchange of information between health professionals, they enable transfer of patient records between sites and they can improve clinical effectiveness, continuity, and quality of care by health professionals (Mansell and Wehn 1998). ICT applications facilitate telemedicine - "the use of ICTs to provide medical demand independent of person-to-person contact" (ibid: 85). Telemedicine provides medical service to people in geographically diverse settings: at home and in isolated places or in emergencies. An example of the impact of ICTs on medicine is the recent operation that was performed at the Chris Hani Baragwanath Hospital. Separated by 8917km, two surgeons made South African medical history when they jointly performed an operation on a two-year-old. Dr Bob Banieghbal at Chris Hani Baragwanath Hospital in Soweto and Professor Benno Ure at his offices in Hannover, Germany, made use of the latest advancement in surgery - the telementoring system, 'Socrates' - to perform a laparoscopic surgery (Green, 2003). 'Socrates' works by linking surgeons in the operating room with colleagues anywhere in the world. A voice-controlled robotic arm (Aesop) positions and holds an endoscope (a minute camera used to view internal organs) which is inserted into the patient via the navel (ibid.)

**Special Needs (for the Physically Challenged)**

For many people with physical disabilities, ICTs can be extremely useful in providing access to communication, education and open up opportunities for them. The use of Braille keyboards and printers can help alleviate some common literacy and numeracy problems for visually impaired or blind people. Most telecommunications infrastructures are now being designed with the capabilities of meeting the special needs of the physically challenged. For instance, the Short Message Service (SMS) can be used to send and receive messages by the hearing impaired, the voice activated dialling service can be used by visually impaired.

**Education**

The education sector is arguably one major area that ICTs are playing remarkable a role. These technologies help in facilitating learniship and exchange of educational materials. ICTs are helping library professionals store and manage academic information. Libraries have migrated from the traditional Dewey cataloguing sytem to an on-line system, which is a web-based cataloguing and search application. The online learning system is another web-based application that isvolutionalising the learning platform of education. This system compliments the traditional face-to-face teaching and learning format. In the on-line system, students can access class notes, submit assignment and also join a discussion group with other learners.

**Environment**

ICT applications can help in collecting data about environmental issues. They allow access to information and provide support sytem to manage and monitor environmental issues. For example, the Geographical Information focuses on the collection, storage, analysis, display and application of geographic data (Mansell and When 1998). The Geographic Information System (GIS) is one of the Geographic Information Technology applications. The GIS can be regarded as an advanced equivalent of a traditional map from which a wide array of information can be extracted for specific purposes. The
GIS is an automated system that enables the capture, storage, checking, integration, manipulation, analysis, display, and modelling of complex spatial data (ibid.). The GIS can be useful in the integration of information on climate, soils, and terrains from different sources.

**Agriculture**

At the micro level, ICTs applications can be used to impart information directly to farmers and the farming community. There are expert system designed to handle agricultural issues such as water utilisation and management, pest control, harvest management and so forth.

**Sharing Knowledge and Improving Access to Information**

This has been one of the most recognised uses of the ICTs. Various communication technologies, ranging from broadcasting to telecommunications and to the Internet are playing effective roles in the acquisition and sharing of information. The concepts of the 'information revolution' and 'information society' are driven by enormous advancements in ICTs and their application. The Internet for example, has provided platforms for sharing information in applications such as the E-Mail and The World Wide Web.

**Facilitating Activities in the Business Sector such as:**

**Manufacturing**

ICTs applications are linking the process chains in manufacturing as opposed to improving or facilitating single steps in the production lines. The old 'Fordist' or mass production of goods and services is gradually giving way to a network-based production and manufacturing system. There has been a shift from the old production system to a new mode which is facilitated by information and communication technology. While the old production and manufacturing system is energy-intensive, standardised and departmentalised the new manufacturing system facilitated by ICTs is information-intensive, customised, networked and integrated. Furthermore, the design stage of product manufacturing benefits enormously from the use of ICTs. For instance, the use of Computer-aided-design (CAD) has improved the design stages of machine tools.

**Electronic Commerce**

Electronic commerce or e-commerce is the use of telecommunications or the Internet to carry out business of any type. Common examples of e-commerce are business-to-business e-commerce, online shopping, online banking, online stock trading etc. One of the advantages of e-commerce is the reduction of transaction costs. Electronic transaction of business activities has 'redefined' the concepts of 'market', 'seller' and 'buyers', as they all converge now on the electronic space. Billions of dollars worth of transactions are completed on the Internet. This development has warranted national government involvement in regulating e-commerce activities.

**Travel and Tourism**

The travel and tourism industry has been heavily affected by ICT applications. The Internet, in particular, has been useful in many regards to the travel and tourism sector. It is used to provide multimedia information about destination to prospective travellers. It also affects auxiliary industries, such as the transport sector, which plays a major role in the tourism industry. With the aid of ICT applications, prospective travellers can view a destination, book accommodation, book the flight and
other forms of transport and pay for all these without leaving their homes. The use of ICTs has permeated the travel and tourism industry. ICTs in this industry consist of various components that include computerised reservation systems, teleconferencing, video, video brochures, management information systems, airline electronic information systems, electronic funds transfer, digital telephone networks, smart cards, mobile communication, e-mail, and Internet (Mansell & When, 1998). These various communication technologies are being used in all sectors travel and tourism industry and related sectors (see Figure 1.1).

Fig 1.1: Integrated Information Technologies for Integrated Tourism and Local Economy Management

Source: Mansel &When (1998)