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The Impact of ICT In The Community

Southampton is the largest city on the south coast of England. It is a major port and the closet city to the New Forest. It lies roughly in the centre of the coast, at the northern-most point of the Southampton Water where it is joined to the River Itchen and River Test. Southampton is a port, and it is used for many things such as ferrying, imports and exports.

Security Guards watching CCTV monitors

CCTV is one of the most obvious pieces of technology in the community in use. It stands for closed-circuit television and is used for surveillance. Even though it has television in the name it is not exactly like the 'normal television' that we watch on our TV's at home, that is broadcast television which gets openly transmitted, this closed-circuit television gets transmitted only to specific monitors. These monitors have people, such as security guards watching them to keep 'an eye out' for any crime that may be going on.

Many people are against CCTV because they believe it to be an invasion of privacy. They believe that CCTV displaces crime, rather than stopping it, that crime-doers would just go somewhere where there are no cameras instead of just stopping. Because of CCTV being in housing areas now some people believe it to now be a social control measure instead of it being a way to stop crime. 'In *2*00*7*, the *UK* watchdog CameraWatch claimed that the majority of CCTV cameras in the *UK* are operated illegally or are in breach of privacy guidelines. In response, the Information *O*ffice denied the claims adding that any reported abuses of the *D*ata *P*rotection *A*ct are swiftly investigated.' This is a major reason for people to be against CCTV.

But many people are for CCTV because it can help them feel safer around their neighbourhood or shopping centres. Businesses like CCTV because it is an easier and cheaper way to have security in their building; they only have to have one or two security guards, who don't have to do patrols.

ICT is used largely in hospitals there are C*A*T scanners, MRI scanners and *U*ltrasounds to name a few.

C*A*T (Computed *A*xial Tomography) scans originally were known as EMI scans and also can be known as CT scans. *A* C*A*T scan is when you are placed on a bed, the bed then moves and lots of x-rays are taken of you in seconds, slices of

A CT Scanner

your body are in these photos, which can then be studied by a doctor, this is called tomography. There are many types of CT such as:

- Electron Beam CT
- Helical or Spiral CT
- Multislice CT
- Dual Source CT
- 256+ Slice CT
- Inverse geometry CT

All of these types of scans are third generation, third generation is obviously the third generation of CT scanners developed, there are five generations that are widely known and third generation is the one most commonly used. It has *256-1000* detectors, its beam is wide fan, its configuration is rotate-rotate and its minimum scan time is *0.5* sec.

Magnetic resonance imaging or MRI is used in medical imaging to visualise the structure and function of the body. MR is a softer way to look at the body than CT and is normally used in muscular or tissue diseases. It uses no ionizing radiation like CT. The scanner makes a magnetic field which aligns the magnetization of hydrogen atoms in the body. Again there are different or specialist types of MRI scans, these are:

- Diffusion MRI
- Magnetic resonance angiography (MRA)
- Magnetic resonance spectroscopy (MRS/MRSI)
- Functional MRI (fMRI)
- Interventional MRI
- Radiation therapy simulation
- Current density imaging (CDI)
- Magnetic resonance guided focused ultrasound (MRgFUS)
- Multinuclear imaging

People can find MRI scans to be very disconcerting; many people are put under general anaesthesia when undergoing a MRI scan. Pregnant women and children especially find it hard not to move. People with claustrophobia normally have to go under anaesthesia too. Other people can wear headphones to listen to music or watch a movie while in the scanner.

Ultrasound is cyclic sound pressure with a frequency greater than what the human ear can hear. It is mainly used to se e fetuses in a mother womb. Ultrasounds are used to:

- Date the pregnancy
- Confirm fetal viability
- Determine location of foetus
- Check the location of the placenta in relation to the cervix
- Check for the number of fetuses
- Check for major physical abnormalities
- Assess fetal growth (for evidence of intrauterine growth restriction)

- Check for fetal movement and heartbeat.
- Determine the sex of the baby

Ultrasounds also have many other uses, such as detecting pelvic abnormalities, cleaning teeth, liposuction, tooth and bone regeneration, cataract treatment, therapeutic ultrasound and treating benign and maligent tumours to name a few.

Ultrasound is also used in the industry business, it is used primarily to measure the thickness of objects and to find any flaws in materials and sometimes it is used for heat transfer in liquids. It can also be used to clean small objects such as jewellery, lenses, watches, dental instruments, surgical instruments and industrial parts. An ultrasonic cleaner works by energy released from the collapse of millions of microscopic cavitations near the dirty surface. The bubbles formed by cavitation collapse forming tiny jets directed at the surface.

GPS or Global Positioning System is the only fully functional Global Navigation Satellite System (GNSS). It uses at least 4 satellites that transmit microwave signals. This allows the GPS in question to determine its location, speed, direction and time. It is a useful tool for map-making, land surveying, commerce, and scientific uses. It also provides a precise time reference used in many applications including scientific study of earthquakes, and synchronization of telecommunications networks.

Unlaunched GPS Satellite

The current GPS consists of three major segments. These are the space segment (SS), a control segment (CS), and a user segment (US).

The space segment comprises the orbiting GPS satellites, or Space Vehicles (SV) in GPS parlance. The GPS design originally called for 24 SVs, 8 each in three circular orbital planes, but this was changed to 6 planes with 4 satellites each. The orbits are sorted so that at least six satellites are always seen from almost everywhere on Earth's surface.

The US Air Force has monitoring stations in many countries such as Hawaii, Kwajalein, Ascension Island, Diego Garcia, and Colorado Springs, Colorado. The information is sent to Air Force Space Commands main base in Colorado Springs, where they get regular updates from the other monitoring stations.

The user segment is the GPS receiver. Generally GPS receivers are made of an antenna which is tuned to the frequencies transmitted by the satellites, receiver-processors and a stable clock. It may also contain a display for providing information to the user. A receiver is often described by its number of channels, which has progressed over the years from 3 or 4 to (in 2006) twelve and twenty channels.

GPS is a easy way to travel around, making it simpler and quicker to get somewhere, SatNav is commonly used now to find a way to get to somewhere the driver doesn't know how to. There are choices of routes, the

user can choose to go the fastest, shortest, most scenic, longest, slowest, least use of motorway, most use of motorway to name a few. The user can choose to have a voice to tell them where to go so that they don't have to keep looking at a screen to see where to go so that they don't get distracted.