Just miserable and bored – but think also

Art & Culture, Music

Just for a momentimagine a world without information and communication technology. What wouldyour life be like without ICT? You would have no mobile phone, no MP3 player, no television, no internet for email and web browsing, no computer games – no computersat all! All these you could probably live without, even if you were miserableand bored – but think also about all the ICT in use around us – we rely on ICTto provide us with power for lighting and transport and as a way of managingcar engines, and keeping airlines, buses and trains running to time withoutwhich our life would, as we know it, be impossible. There are places andpeople in the world today that manage quite well without all the informationand communication technology that we take for granted but theywould find itimpossible to run many aspects of their lives the way we do. Our modernsocieties would not be as pleasant and may not survive as weknow it without ICT. ICT is all around us, in our homes, in our schools and businesses and in the infrastructure thatallows our society to work and function.

A computer is aprogrammable machine that follows a set of instructions. Early computers weremechanical with levers and cogs such as Charles Babbage's Difference Enginewhich was an automated, mechanical calculator, large enough to fill a smallroom! Babbage's Analytical Engine was designed to be a general purpose computerbut was never built, some believe, because the technology of the day was eithernot good enough or too expensive. Babbage was stillworking on the design when he died in 1871. A working model was built in 1992and can be seen in the Science Museum in London Analogue computersexisted long before digital computers were invented.

Guns were targeted usingmechanical analogue computers during World War I and the Korean War by theUnited States Army Air Force. Modern computers are not mechanical but areelectronic and, while some analogue computers are used in universities forresearch, most computers now are digital. Computers can followor execute a set of prewritten or recorded instruct ions, called a program, andrespond to commands entered by a user. All computers used today have the samebasic structure, although the way the components are arranged in the structurediffers depending on the use to which the computer will be put. Personal computersinclude netbooks, laptops, notebook computers, palmtops, desktop computers, tablet computers, PDAs and handheld computers.

Modern mobile telephones canalso carry out many of the tasksnormally associatedwith personal computers with the added advantages of being able to keep incontact with friends by text message or telephone, having an inbuilt camera andplaying music or video files or using applications when out and about away fromhome. Personal computers areoften found in businesses and are used for general tasks such as runningdatabase management systems, business spreadsheets and for specialised businesspurposes such as computer-aided design and computer-aided manufacture such asmaking cars or televisions. Also, personal computers can be used for capturingand monitoring data received from sensors such as for recording temperaturesand pressures of the weather Large organisationssuch as banks, insurance firms and utility companies (these supply gas, electricity and water) may use mainframe computers. Mainframe computers arecomputers which work not as a single computer but as if they were many,

oftendozens or hundreds, of computers each running their own operating systems andcarrying out many tasks at once. The term ' mainframe' is now somewhat out ofdate but it originally referred to the construction of mainframe computers on aset of ' frames' or racksthat held thecomponent parts. Mainframe computers are used where large amounts of data needsto be processed in bulk, e. g. the processing of bank statements, utility billsor stock control.

Supercomputersare the fastest computers that exist in terms of the speed of calculation andare used, for instance, in university research departments where fast andcomplex calculations need to be carried out. This includes the complexcalculations needed for simulations or modelling scenarios such as those neededfor modelling climate changes. Here large amounts of data collected from manyareas will need to be used to try and predict what will happen to the climate. Thedistinction between mainframe computer and supercomputer is often not thatclear today but supercomputers are usually ' one of a kind', built for a particularpurpose, although supercomputers often contain the same components as othercomputers – just more of them! At the other end ofthe scale, embedded computer systems are found in everyday devices and carryout only one or two tasks so they do not need to be as flexible as a personalcomputer.

An embedded computersystem controllingtraffic lights at a road junction does not need to do anything else. Musicplayers, mobile phones, microwave ovens, washing machines, digital watches andcalculators all contain embedded systems. The components andsoftware in these devices only

have to carry out their designed function and noother; for instance, in an iPod there is only a need for software to organiseand play music and videos. A mobile phone will contain software that controlsthe connection, address lists and text messages but will not usually have to domuch else. Of course, as the device such as an iPhone becomes more complicatedand able to carry out more functions, the embedded software has to be added to, but simple devices like a washing machine will probably only ever be requiredto wash clothes. The physicalcomponents of a computer system are called the ' hardware' and the instructionsthat make the system work and which the system follows are called ' software'. Hardwareis all of the physical components that can be touched, held and seen. Dependingupon the type of computer system in which they are fitted, the hardwarecomponents will look different and be larger or smaller in sizebut will perform thesame function.

Hardware include: Input devices, Processor, Output devices, Internal memory, Backing storage, CPU etc Software is used to'program' the computer system which means to create a set of instructions, usually stored or saved for later use, that the computer will follow. Differenttypes of software are used for different tasks, e. g. the software that controlsthe hardware and allows a user to interact with a computer system is theoperating system while software that enables users to carry out tasks is calledapplication software – or simply applications. Other types ofsoftware include utility software that does a specific task such as checking adisk drive for errors, and ' drivers' that allow the operating system tocommunicate with, e. g. a printer.

Today, many utilities and drivers areincluded in the operating system and are already present after the operatingsystem has been installed but if new hardware is added then new drivers mayhave to be installed.