Unit 3A

Social implications and trends
The impact of ICT on Individuals, communities and environments

Individuals
- Online addiction – such as social networking and online games, the need to be on the internet to socialise and play games.
- Online addiction can lead to health and mental problems in the future, unable to cope with everyday activities.
- Public safety (issue) – on social networking such as sharing private information.
- Can have a positive effect meaning that you can share information and resources online between other individuals.

Communities
- Impact on the labour force – replacing actual employees to robots/ new technologies.
- Violation of privacy.
- Location anywhere in the world (GPS)
- Business Boost (Collecting useful geographical location, Airline company)
- Social Media (Self-expression, communication of others online)

Environment
- E-waste – old technology will contain hazardous chemical which can cause harm to the environment.
  - Electronic waste can last for a long time, so therefore the space is required for landfills of waste to be made. – To do this an area will need to be wiped out.
- Climate change – due to some technologies releasing greenhouse gases, or through E-waste decomposition.
- With improper use of paper, trees will be wasted, so therefore recycle.

Finance and the economy
- Decreased profit in the retail sector (e.g. Harvey Norman, Good Guys etc...) due to the fact that it is cheaper online to buy electronics or other goods.
- Online retail will increase – due to the majority of people are now online, and is using the internet as a source to buy products and services.

Values, ethics and inclusivity
- Values - the accepted principles or standards of a person or a group.
- Ethics - Moral principles that govern a person's or group's behaviour.
- Inclusivity - An intention or policy of including people who might otherwise be excluded or marginalized, such as those who are handicapped or learning-disabled, or racial and sexual minorities.
- Changing societal values and ethics in the use of ICT (MySpace, Facebook)
  - Cyber bullying
  - No use of body language
  - Some information posted on social networks can be misinterpreted.
- Implications of identity theft
  - Identity theft - The fraudulent acquisition and use of a person's private identifying information, usually for financial gain.
  - Consequences are the loss of money and bad credit history
  - Social impacts – people that lose their identity can look like frauds, and so others won’t trust them.
- Inclusivity in the design of ICT products and services
For websites — the integration of inclusive features on the website, such as the search bar, sitemap, voice recognition, text resizer, colour changer and language changer.

Hardware — equipment to suit the user, so therefore ergonomics is used to do this.
- Ergonomics - the study of how a workplace and the equipment used there can best be designed for comfort, efficiency, safety, and productivity.

Others — subtitles for the death when watching videos on ICT devices.

- **The digital divide** — refers to the inequality between groups, broadly construed, in terms of access to, use of, or knowledge of information and communication technologies (ICT).
  - Ways to reduce the digital divide:
    - Donate old technologies to poorer countries who can’t afford them.
    - Increase the coverage range of the internet service throughout the continent.
    - Offer free information and services on using ICT technologies (seminar etc...)

- Ethics of employer and employee relationships regarding the appropriate use of ICT technologies in the workplace.
  - Code of conduct — employees have to follow to stay on task with the job

- **Legislations:**
  - Spam Act 2003:
    - The ACMA enforces the *Spam Act 2003* and accepts complaints, reports and enquiries about spam in Australia. The Spam Act specifically relates to messages sent to Australians by email, SMS, MMS and instant message that:
      - offer, advertise or promote the supply of goods, services, land or business or investment opportunities
      - advertise or promote a supplier of goods, services, land or a provider of business or investment opportunities
      - assist a person to dishonestly obtain property, commercial advantage or other gain from another person.

  - Copyright Act 1968
    - Enforces that the intellectual property of the intellect will not be reproduced in any shape or form.
    - Therefore protecting:
      - textual material
      - computer programs
      - compilations
      - artistic works
      - dramatic works
      - musical works
      - cinematograph films
      - sound recordings
      - broadcasts
      - published editions

    - Key points:
      - Copyright protection is free and applies automatically when material is created.
      - There is NO registration system for copyright in Australia.
      - Copyright does not protect ideas, information, styles or techniques.
      - Copyright does not protect names, titles or slogans.
      - There are no general exemptions from copyright law for non-profit organisations.
There are some situations where copyright law allows people to use copyright material without permission for their own personal use, but these are narrow and specific. Australian copyright law applies to actions that take place in Australia, even if the material used was created or first published in another country.

Privacy Act 1988
- Prevents and regulates information privacy.
- States that everyone will have the right to have their personal information secure and protected.

**Past and emerging trends in ICT**

- **Present and emerging trends**
  - Examples:
    - Sport: Real time updates
    - Education: integration of social media for teacher/student help
    - Advertise online, extend target audiences

- **Convergence of multimedia trends**
  - Digital convergence is the transformation putting IT, electronics and entertainment together. An example includes an iPad. An iPad is an electronic device that allows you to read books, make notes, watch movies and do productive things like learning and writing up documents.
  - Haptic Technology - is a tactile feedback technology which takes advantage of the sense of touch by applying forces, vibrations, or motions to the user.
  - Human Kinetics - is the study of human biomechanical movement.
  - Robotics - the science and technology relating to computer-controlled mechanical devices such as the automated tools commonly found on automobile assembly lines.

**Hardware and software**

**Hardware components and functions**

<table>
<thead>
<tr>
<th>Windows</th>
<th>Mac</th>
<th>Linux</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pros:</strong></td>
<td><strong>Pros:</strong></td>
<td><strong>Pros:</strong></td>
</tr>
<tr>
<td>Compatibility: Almost every application, driver or game will work on Windows.</td>
<td>Viruses: Apple Macs get almost no viruses. This is mostly due to Window's superior market share.</td>
<td>Price: Free</td>
</tr>
<tr>
<td>Technical support: Having so many users, you can usually find someone (either online or offline) who can help you with Windows.</td>
<td>Reliability: Macs only run on Apple computers, and are thus less prone to hardware and software crashing.</td>
<td>Variety: Linux is not a full operating system. It is just a kernel. To use the kernel, additional software needs to be bundled with Linux. Several hundreds of these bundles exist. The most popular ones include Ubuntu, Mint and Fedora.</td>
</tr>
<tr>
<td>Huge quantity of function: When you get to know Windows well, you'll find out that there</td>
<td>Looks: Better User Interface.</td>
<td>Viruses: Although being more vulnerable to viruses</td>
</tr>
</tbody>
</table>
are so many functions that you can do almost anything quite easily. than Mac (because it is open source), Linux still has very, very, very few viruses.

### Cons:
- Viruses: You may need to buy an antivirus program, although free ones exist.
- Slow: Windows, especially Vista and 7, requires a lot of computer resources (memory, processor, disk space), and thus, runs slower.
- Price: It easily costs over a hundred dollars.

### Cons:
- Expensive: Mac costs even more than Windows.
- Only available on Apple computers: If you already have a computer, you cannot install MAC on it unless it's an Apple. Otherwise, you must buy a new computer.
- Compatibility: Only a few programs will run on Mac, and almost no games.

### Cons:
- Complicated: most of them will require a good deal of computer knowledge in order to get them to work.
- Compatibility: Like Mac, representing only a few percent of the market share, Linux does not have as many programs and games as Windows.
- Vendors: You won't find a lot of vendors selling Linux computers. Usually, you'll just end up having to buy Windows computer, reformatting the hard drive, and installing Linux yourself.

- Windows is ideal for the business environment, while Mac is ideal for the multimedia manipulation environment due to the improved graphic system.

### Hardware specifications
- CPU – Central Processing Unit
- Primary Storage – The RAM and the ROM
- Secondary Storage – HDD (Hard Disk Drive), SSD (Sold State Drive)
- Graphics Output – Graphics card
- Sound Input/output – headphones, speakers, microphone.
- Visual Output – Monitor
- Peripherals – mouse, keyboard, graphics tablet etc...

### Current Specifications Hardware:

#### Desktop

<table>
<thead>
<tr>
<th></th>
<th>Home</th>
<th>Business</th>
<th>Multimedia</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel Core i3-3220 Dual Core @3.3GHz Processor</td>
<td>Intel Core i5-3470 Quad Core @3.6GHz Processor</td>
<td>Intel Core i7-3770 Quad Core @3.9GHz Processor</td>
</tr>
<tr>
<td>Primary Storage</td>
<td>8GB DDR3 @1333MHz RAM</td>
<td>8GB DDR3 @1333MHz RAM</td>
<td>16GB DDR3 @1600MHz RAM</td>
</tr>
</tbody>
</table>
### Applied Information Technology 2012 3AB Notes

<table>
<thead>
<tr>
<th>Secondary Storage</th>
<th>750 GB @7200 RPM HDD</th>
<th>1 TB @7200 RPM HDD</th>
<th>2 TB @10000 RPM HDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor Size</td>
<td>19 inch</td>
<td>21 inch</td>
<td>30 inch</td>
</tr>
<tr>
<td>Other</td>
<td>Network Card, WIFI Card.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Laptop**

<table>
<thead>
<tr>
<th></th>
<th>Home</th>
<th>Business</th>
<th>Multimedia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Intel Core i3-3110M Dual Core @2.4GHz Processor</td>
<td>Intel Core i5-3210M Dual Core @2.5GHz Processor</td>
<td>Intel Core i7-3520M Quad Core @2.9GHz Processor</td>
</tr>
<tr>
<td><strong>Primary Storage</strong></td>
<td>4GB DDR3 @1333MHz RAM</td>
<td>8GB DDR3 @1333MHz RAM</td>
<td>16GB DDR3 @1600MHz RAM</td>
</tr>
<tr>
<td><strong>Secondary Storage</strong></td>
<td>750 GB @5400 RPM HDD</td>
<td>1 TB @7200 RPM HDD</td>
<td>2 TB @7200 RPM HDD</td>
</tr>
<tr>
<td><strong>Screen Size</strong></td>
<td>15.6 inch</td>
<td>16.1 inch</td>
<td>18.4 inch</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Network Card, WIFI Card.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Specialised functions of peripheral devices:**
  - Graphics Tablet - a device consisting of an electronic pen and an electronically sensitive surface, used to enter designs into a computer by drawing them.
  - Interactive whiteboard - large interactive display that connects to a computer and projector. It provides user interaction between the whiteboard and the computer, e.g. touching a point on the whiteboard can indicate to the computer that it is clicking.
  - Video Capture cards - used to provide TV capabilities to the computer, for watching television on and recording programs.

- **Help and support**
  - Online forums – enables users to discuss and solve problems relating to the hardware and software functionality.
o Live chats with technicians – allows direct communication between experts to solve problems.
o Online tutors – uses live chats to help the users.
o Video conferencing – allows video and audio contact between the users.
o Bulletin boards – an online forum used to exchange e-mails, chat, and access software, basically a ‘Online forum’
o Remote Desktop Connection – provides a way to connect a computer to a specialised expert to fix problems, over the internet.

Applications and systems software
- Operation and maintenance of system utility tools and accessories:
  o Disk clean-up tools ⇒ clean up temporary files, registry files, and internet cache to free up space on the HDD.
o Disk backup tools ⇒ back up files, information for future use and to protect data by restoring damage files.
o Disk fragmentation ⇒ the correction to existing fragmentation is to reorganize files and free space back into nearby areas to optimise read/write operations of the HDD.
o Antimalware/ virus/ spam/ spyware – provides protection for an ICT device from threats on the internet. By detecting and removing malicious programs and software.
- Use and manipulate application software to combine media to create information products:
  o Animation, audio and image software ⇒ Adobe Photoshop, Adobe Dreamweaver, Windows Live Movie Maker etc...

Design and acquisition of hardware and software
- Benchmarking
  o The process in which a product or service is compared with a similar product or service in terms of its performance.
     Can be business related or ICT related
  o Purpose: To discover what is the best performance achieved, to be compared to another product or service to see if any upgrades or changes are required.
o Types of benchmarking (Majority of these are related to business):
   Internal benchmarking – used when a company already have established and proven best practices.
   Competitive benchmarking – evaluating the position within its industry.
   Strategic benchmarking – used when identifying and analysing world class performance.
   Functional benchmarking – investigates the performance of core business functions.
   Best practices benchmarking – assess work processes and business management practices.
   Product benchmarking – reverse engineering a product to assess the design of the product.
- Selecting hardware and software for a specified purpose
  o Hardware considerations to run software (minimum requirements) = processor, processor speed, RAM, hard disk drive (storage space), monitor, graphics card, sound output, video output etc..
o Recommended requirements = better performance.
o Warranty, help and support services.
- Compatibility issues of running the latest software on current hardware
o Some software will require higher processor or graphics card to run, so therefore the overall performance of the software is decreased or would not run if the minimum requirements on the package of the software are not met.

o 32 bit programs are compatible with 64bit systems, but 64 bit software will not be compatible with 32bit system due to the fact of the memory usage.
  - 32 bit = 32bit processor and 4GB RAM (Max)
  - 64 bit = 32/64 bit processor and 8GB RAM +

**Digital data and information**

*The nature, forms and transfer of digital data*

- The impact and use of different file formats on transferring data
  - Things that need to be taken into consideration between file sizes:
    - The security of data, which file format allows for encryption of data.
    - The compression of data, some file formats such as images have compression settings which can be used to reduce the size of the data.
    - The software requirement to view the data of that specified file format.
    - Quality of the data.
  - Impacts:
    - By using a high quality bigger size file format, it will take a while for that data to be transferred.
    - No security = easier access to the data, not ideal for sending private information.
    - If the data download cannot be read by the program on the ICT device, due to the limited capabilities of that devices.
      - Can be avoided by downloading additional software to read/view the data.
    - No use downloading corrupted data, as it will be unable to open.
    - Some data can be missing via the transferring stage = corrupted data.

- Impacts on communication connections such as wireless, cable and satellite

<table>
<thead>
<tr>
<th>File Types</th>
<th>Wireless</th>
<th>Cable</th>
<th>Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Able to transfer data such as music, videos, information and images. But the rate in which these file types are transferred depends on the medium.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost</th>
<th>Wireless</th>
<th>Cable</th>
<th>Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cheap, as it only requires little hardware for the transmission of data. Some hardware might include the wireless card, the cables etc...*Depending on the type of cable, Fibre optics = expensive, UTP = cheap.</td>
<td>Expensive, requires additional hardware such as radar dish, and signal transmitter/receiver for the transfer via satellite.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (size of transfer per second)</th>
<th>Wireless</th>
<th>Cable</th>
<th>Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td>802.11 = 1 or 2 Mbps</td>
<td>Standard Ethernet = 10Mbps to 1Gbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>802.11a = Up to 54 Mbps</td>
<td>Fibre Optics = 1Gbps to 100Gbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>802.11b = Up to 11 Mbps</td>
<td>Up to 1Gbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>802.11g = 54Mbps + 802.11n = 108Mbps+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interoperability</th>
<th>Wireless</th>
<th>Cable</th>
<th>Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange of data through the use of wireless radio</td>
<td>Exchange of data through electronic signals</td>
<td>Exchange of data through wireless radio waves and</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Location</td>
<td>Anywhere, requiring you to be close to a Wireless access point. As wireless networks will have a limited range in transmitting signals.</td>
<td>Stationed at a location where there is an Ethernet cable connected to your device. No Mobility.</td>
<td>No restrictions, Anywhere in the world, if the satellite covers the continent.</td>
</tr>
<tr>
<td>Access</td>
<td>Requires a wireless card to communicate between devices. Wireless access point.</td>
<td>Requires a network interface card, for the cable to be connected.</td>
<td>Requires a Radar dish and signal transmitter/ receiver for stationary ones, or a satellite card (like 3G/ 4G on mobile phones) for the mobility.</td>
</tr>
<tr>
<td>Availability</td>
<td></td>
<td>24/7</td>
<td></td>
</tr>
</tbody>
</table>

- **Network bandwidth requirements for storage and retrieval**
  - Certain file types will be big, so therefore compression should be taken into consideration to transfer these files faster to free up the network, instead of having large files to download therefore effecting the download and upload speeds of the network; hence bandwidth.
  - Some file types will include information that is highly personal, and if that information is leaked then the business will face the consequences. To avoid this encryption should be taken into consideration, as it turns readable data into non-readable codes. This would not affect the bandwidth at all, but provides extra security measures to keep data private.
  - If the data is being transferred over the internet, take into consideration the time in which data is being transferred. During peak times where people use the internet the most which is in the evening and the mornings, the bandwidth will be significantly decreased due to the load of operations traveling through the ISP for an internet connection. So downloading and uploading at time later than peak hours will provide faster transfer speeds.

**Processing and managing data**
- **Techniques and processes relating to data in a multimedia environment**
  - **Sources of Data**
    - Data is gathered by many methods, but the most common are:
      - You gather it yourself i.e. it is original data.
      - You get it from someone else i.e. indirect data.
      - You work on some original data and generate a new set from it.
      - Archives.
    - **Original Source** – collected as part of a transaction in shops (e.g. credit cards), collected in surveys and collected from sensors.
    - **Indirect Source** – An indirect source is where data is now used for a purpose other than that for which it was originally collected.
By Product of processing - Sometimes it is much more useful to look for patterns and relationships in the data, rather than use the raw data itself.

Archive - You never know when data might be needed in the future, and so people make efforts to keep the data safe in an archive.

Processing of Data
- Processing transforms the data into useful information.
- Making use of computers - quite often, there is a vast amount of data to be processed and so it is loaded (input) into a computer.

Transactions
- All data processing systems are concerned with transactions – data that needs to be recorded. Three methods of when data can be processed: Real-time, Transaction and Batch.
  - Real-time → No Delay
  - Transaction → Short Delay
  - Batch → At a later time
    - Real time processing occurs instantaneously.
    - In transaction processing data is entered and processed “straight away”; however, there may be a short delay.
    - Batch processing is used when there are a large number of similar transactions to be processed. All the data to be processed is collected together BEFORE being processed in a single operation. Processing is delayed (e.g. Bank billings)

The use of Databases to source, organise, process, manage and store data
- Two types of Databases:
  - Flat-file Databases - simple database that stores all data in a single table. E.g. Records (birthdates, age), Field (Name) and File (whole document).
    - Useful for address books, contact book, CD collection,
    - Used for more simple data that is not private.
  - Relational Databases - is a more complex database that stores data in multiple tables that are interrelated (does not need to be duplicated).

Issues and Benefits

<table>
<thead>
<tr>
<th>Flat-file Database</th>
<th>Relational Database</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issues:</strong></td>
<td><strong>Issues:</strong></td>
</tr>
<tr>
<td>Redundancy: large amounts of duplicated data (can become big very quickly).</td>
<td>Hard to Set up</td>
</tr>
<tr>
<td>Needs to create new records every time.</td>
<td></td>
</tr>
<tr>
<td>Uses up disk space and makes database slower.</td>
<td></td>
</tr>
<tr>
<td>Reduced to data integrity: More likely to be inaccurate due to data input errors and inconsistent data entry.</td>
<td></td>
</tr>
<tr>
<td>Difficult to Update: If entries change, all instances have to be updated.</td>
<td></td>
</tr>
</tbody>
</table>
Security: All users have access to the same set of data.

Program-Data Dependence: The user interface is tied to a specific file. To create new views of data you would need to create a new data files.

Benefits:
- Easy to Set up

Benefits:
- Reduced redundancy
- Improve data consistency
- Improve data integrity
- Better security
- Program-data independency (less queries)

Ensuring accuracy, reliability and validity of the data
- The majority of errors are introduced at data entry. E.g. entering wrong product codes, add up cost incorrectly, faulty connections between hardware components such as the processor.
  - Transmission Errors (when data is manually copied) – writing errors, voice errors (bad reception)
  - Transmission Errors - Data that has been entered correctly in a system can become corrupted when it is transmitted within a computer or when sent from one computer to another.
  - Processing Errors - Errors can occur due to incorrectly written software.
  - Reduce errors:
    - Validation - is about making sure that the data entered is sensible and possible and within reasonable bounds – e.g. allows only a certain number of characters to be inputted. What Validation can do, is to check that the data is sensible, reasonable and allowable.
    - Verification - is used to check that data is entered correctly and that there are no transcription errors – asked to enter email or password twice.
    - CAPTCHA – Completely Automated Public Turing test to tell Computers and Humans Apart.

Data validation techniques
- Alphabetic/Numeric Check ensures that users enter only alphabetic data into a field. Numeric check ensures that user enter only numbers into a field.
- A range check determines whether a number is within a specified range.
- A consistency check tests the data in two or more associated fields to ensure that the relationship is logical and their data is in correct format.
- A completeness check verifies that a required field contains data.
- Check Digit – is a number(s) or character(s) that is appended to or inserted in a primary key value.

Minimisation of threats to the integrity and security of data
- Threats:
  - A virus is a small piece of software that piggybacks on real programs. Each time a program runs, the virus runs, too, and it has the chance to reproduce.
- An e-mail virus travels as an attachment to e-mail messages, and usually replicates itself by automatically mailing itself to dozens of people in the victim's e-mail address book.
- A Trojan horse is simply a computer program. The program claims to do one thing (it may claim to be a game) but instead does damage when you run it.
- A worm is a small piece of software that uses computer networks and security holes to replicate itself.

Minimise damage by:
- Biometrics - Biometrics means to measure and analyse human characteristics in order to correctly identify an individual. E.g. fingerprints, voice patterns, facial patterns, palm prints. Believe to be more secure than many other methods because the physical characteristics are unique to every individual and cannot be stolen, lost or copied.
- Logical Methods - Backups, firewalls, encryption, software patches_updates, antivirus software, access rights, user IDs and passwords
  - Backups - A copy of the backup should be stored onsite so that if the system fails or is corrupted, then the system can be reinstalled or updated quickly form the backup. Many companies are beginning to use online data storage for their backups. (Cloud Storage)
  - Firewalls - A firewall is a program or hardware device that filters the information coming through the internet connection into your personal computer or into a company's network. They protect hackers from breaking into networks.
  - Encryption - Method of scrambling data in such a way that only the people who have the 'secret key' can encrypt or unlock the data to read. Encryption works by scrambling the original message into codes and characters.
  - Software Patches/ Updates - Although new software is rigorously tested before it is release for sale, it is impossible to test every single line of code. As soon as a security issue is identified with the software, the manufacturer will work quickly to create a 'fix'.
- Physical way to minimise threats to the data are:
  - Security cameras
  - Guards
  - Keep servers cool
  - Lock the door
  - Security cards
  - Biometrics
  - Common Sense people.

Creative application of information design and principles
- Basically the production section, therefore you should follow it.
- Curriculum dot points:
  - apply information design principles in the creation and promotion of a corporate identity considering:
    - purpose and intended meaning
    - inclusivity
    - usability
    - currency and accuracy of data
o evaluate the effectiveness of the ICT solution against the design criteria
  - a specified target audience including:
    - intent/purpose
    - presentation medium
    - parameters of design
    - content
    - navigation structure
    - interface
    - aesthetics
    - relevant language and terminology
  - compositional rules
    - focal point/centre of interest
    - rule of thirds
    - leading lines
    - framing
    - underlying geometric framework—eye flow
  - typography
  - creative design principles including:
    - **Balance** refers to the distribution of the visual weight of objects, colours, texture and space.
    - **Emphasis/Dominance** is part of a design that catches the viewer’s attention. This is done by making one area stand out by contrasting it with other areas.
    - **Proportion/Scale** is concerned with the size relationships of one part to the whole and one part to another.
    - **Rhythm/Movement** is created when one or more elements of design are used repeatedly to create a feeling or organised movement.
    - **Harmony/Unity/Proximity** is the feeling of harmony between all aspects of a piece of work creating a sense of completeness.
    - **Repetition** refers to the repeating of objects such as the elements of design to create a sense of unity in a piece of work.
    - **Dominance** works to make one area of a piece of work stand out from the rest through the use of contrast.
    - **Pattern** refers to the repetition of similar units over and over to create a sense of order.
    - **Contrast** refers to the differences of design elements of a piece of work that can be seen.
  - elements of design including:
    - **Line** is a mark with greater length than width (can be horizontal, vertical, diagonal, curved etc...).
    - **Shape** is a closed line and can be geometric or natural. Shapes are flat and can express length and width.
    - **Form** refers to three-dimensional shapes which can express length, width and depth.
    - **Space** is the area between and around objects. The space around objects is called negative space (negative space can also have shape).
    - **Colour** refers to light that is reflected off objects. Colour can be primary, secondary or tertiary and warm or cool.
• **Value** refers to the relationship between darkness and lightness. It depends on how much light a surface reflects.
• **Texture** refers to the overall surface quality of a piece of work.
• **Alignment** is the arrangement and position of various aspects of a piece of work.
  o Note: Without the design elements there are no principles. They are interrelated.

**Workplace, practices and careers**

*Careers, work and jobs*

• **Qualifications and training related to evolving technology based employment opportunities**
  o Some examples:
    ▪ **Information Technology (Diploma)**
      • This qualification will provide you with the skills and knowledge to manage information and communications technology (ICT) support in small-to-medium enterprises (SMEs) using a wide range of general ICT technologies. You will learn skills to support computer systems, involving people, hardware, software and procedures in a networked environment. You will also learn skills that enable you to maintain and guide teams and manage projects.
    • **Career Opportunities:**
      o Systems Administrator
      o Office Systems Administrator
      o IT Office Manager
    ▪ **Communication Skills:** Well Developed Skills (3)
    ▪ **Maths Skills:** Developed Skills (2)
    ▪ **Information Technology Systems Administration (Diploma)**
      • This qualification provides the skills and knowledge for an individual to be competent in the administration of a variety of networked computer systems. You will skills in the design and implementation of an integrated server solution, troubleshooting WAN links and IP services in an enterprise network and installing and upgrading an operating system. You will learn about system security, copyright, ethic and privacy in an IT environment.
    • **Career Opportunities:**
      o Internet Systems Administrator
      o Internet/Intranet Administrator
      o Assistant IT Manager
      o Assistant System Manager
    ▪ **Communication Skills:** Well Developed Skills (3)
    ▪ **Maths Skills:** Developed Skills (2)

• **Impacts of ICT on future career opportunities.**
  o Since technology and ICT is still evolving and still growing, there will be more opportunities in future careers in the ICT sector providing more jobs, but with a consequence of reduce pay salary. I don’t know why I’m no Economist.
  o Due to the increase use of technology and ICT, people can also be negatively impacted as technology has become more efficient than humans, so therefore humans can potentially lose their jobs

*Work environment and legislation*

• **Impacts of legislation affecting evolving technologies**
  o Copyright fair dealing, moral rights Copyright Act (Shown in beginning of notes)
- Intellectual Property - Intellectual property rights are the rights to which creators are entitled for their work.
- Occupational Safety and Health Act 1984 – is a cross disciplinary area concerned with protecting, health and welfare of people in work or employment. It provides standards in which businesses have to follow to ensure the safety of their employees, if broken consequences can arise.
  - One way business reduce employee injuries is implementing workplace ergonomics
    - Ergonomics is the study of designing equipment and devices that fit the human body, its movements, and its cognitive abilities.
    - Tips to improve ergonomics and reduce risk of injury:
      - Users can minimise the chance of injury by adjusting the seat tilt of their chair so they feel comfortable while working with the keyboard. Usually, this will be close to horizontal but some users prefer the seat tilted slightly forward.
      - Their knees should be bent at a comfortable angle because if this is not done properly, uncomfortable strains can develop on the leg muscles and feet if they do not reach the floor.
      - Users should change their posture at frequent intervals to minimise fatigue.
      - It is recommended that users should take short rest breaks rather than infrequent long ones. Keyboards should be placed in a position that allows the forearms to be close to the horizontal and the wrists to be straight. Some users prefer to have their wrists supported on a wrist desk.
      - The continuances of a fixed posture for long periods of time are tiring and increase the chances of muscular aches and pains.
      - It is recommended that operators avoid spending more than five hours a day using the keyboard and no longer than fifty minutes per hour without a postural/stretching break.
      - Eye level should be level with the top of the monitor.
      - Use ergonomically designed equipment such as keyboards, monitors, chairs, desks, mouse
      - Adjust lighting so there is no glare on the monitor.
  - RSI (Repetitive Strain Injury) is a condition caused by repetitive motion. In most cases, RSI affects the neck, knees, wrists, back, and fingers. By sitting in one position and performing repetitive motions such as typing and looking at a computer screen, the body can experience strain and muscle fatigue.
    - To reduce this rest every 10 minutes or so, again common sense.

**Technology processes in the workplace**
- Basically production section.
- Curriculum dot points:
  - use and describe common work processes, including use of detailed concept maps, proposals, research and storyboards in product development
  - analysis of client requirements and needs i.e. requirements analysis
  - explain the requirements of individuals or characteristics for the work environment e.g. working independently, cooperatively and collectively.
Unit 3B

Social implications and trends

The impact of ICT on individuals, communities, and environments

- Impact of ICT on industries in the community:
  - ICT has improved communications among people from different areas of the world through video conferencing, social media, email etc.
  - ICT has improved productivity in businesses through the incorporation of databases to store sensitive data, cloud storage for easy to access data, increased the rate of output in the workplace.
  - ICT has allowed users to work more efficiently through the use of application software such as word processing programs, databases,

- Impacts of ICT on individuals working within industries:
  - Technology and instant communication has allowed employees and employers to work from home. This is called telecommuting. Users can work from home without needing to physically travel to the workplace and maintain communication through the internet, email or phone.
    - Benefits = saves time, more work completed, convenient,
    - Negatives = stressful, unable to separate home life with work,
    - Telecommute: Work from home, making use of the Internet, e-mail, and the telephone

Values, ethics and inclusivity

- The impact of access to global markets on the ability to purchase and use of ICT products:
  - Global Markets: users have worldwide access to products (online shopping) and websites through the Internet.
  - Users can also access news from other regions of the world. This is an issue of values and ethics because users may find information that is offensive or insulting.
  - Online censorship of information is a major issue regarding values, ethics and inclusivity. The purpose of online censorship is to block and prevent users from misusing the Internet. However, if online censorship does proceed, all users will be limited to what they can access on the Internet. This is a controversial issue because many users will be punished when they haven’t done anything wrong and also limits their freedom as people.

- End user expectations in differing cultures
  - Different cultures have different values and ethics. For example, the colour blue may symbolise freedom in one culture, but represent something else in another. Due to this, when designing websites or posters or apps, creators must keep in mind to not use anything that maybe be offensive to particular groups or cultures.

- Ethical issues and legislation in industry
  - Ethics in ICT (Code of Conduct) – Within the workplace, there will always be a code of conduct guidelines or a set of rules that outline how employers and employees are expected to behave. This is done to ensure that the business runs smoothly and that every user is protected.
  - Intellectual property – patents, trademarks and registered designs that have some form of value. For example, almost everyone will recognise the logo of MacDonald’s or Coca Cola (when designing a logo, keep it simple yet memorable).

Past and emerging trends in ICT

- Impact of current and emerging trends
o International communications via video conferencing – both businesses and users can easily use video conferencing to communicate with others who may be overseas or in another geographical area. Video conferencing is convenient as people no longer need to physically travel to other locations and can communicate in real time. This use of ICT saves costs, time-saving and very convenient for large businesses.

o Lifestyle choices – ICT has improved the way people live. Users can work from the workplace remotely and gain access to flexible work hours (faster communications, online banking, online storage, saves paper etc...).

o Businesses can now use the internet to promote their products and services to the online market by creating websites (online presentation). This is beneficial as it increases the business’ target market range, advertise and remain competitive in the market.

Hardware and software

Hardware components and functions

- Components, concepts and terminology
  - Network topologies

<table>
<thead>
<tr>
<th>Star Network</th>
<th>Bus Network</th>
<th>Ring Network</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is it?</strong></td>
<td>On a <em>star network</em>, all of the computers or devices (workstation) on the network connect to a central device.</td>
<td><em>A bus network</em> consists of a single central cable, to which all computers and other devices connect. The <em>bus</em> is the physical cable that connects the computers and other devices. Used in LANs.</td>
</tr>
</tbody>
</table>
| **Advantages** | - Fairly easy to install and maintain.  
  - Workstations can be added to and removed from the network with little or no disruption to the network.  
  - If one workstation fails, only that workstation is affected (the other workstations continue to | - Transmits data, instructions and information in both directions.  
  - When a sending device transmits data, the address of the receiving device is included with the transmission so that the data is routed to the appropriate receiving device.  
  - Popular on | - If a computer or device fails, the entire network potentially could stop functioning.  
  - Can span a larger distance than a bus network. |

-
<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>operate normally).</td>
<td>LANs because they</td>
<td></td>
</tr>
<tr>
<td>- Easy to install</td>
<td>are inexpensive and</td>
<td></td>
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<tr>
<td>and wire.</td>
<td>easy to install.</td>
<td></td>
</tr>
<tr>
<td>- No disruptions to</td>
<td>- Computers and</td>
<td></td>
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<tr>
<td>the network when</td>
<td>other devices can</td>
<td></td>
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<tr>
<td>connecting or</td>
<td>be attached and</td>
<td></td>
</tr>
<tr>
<td>removing devices.</td>
<td>detached at any</td>
<td></td>
</tr>
<tr>
<td>- Easy to detect</td>
<td>point on the bus</td>
<td></td>
</tr>
<tr>
<td>faults and to</td>
<td>without disturbing</td>
<td></td>
</tr>
<tr>
<td>remove parts.</td>
<td>the rest of the</td>
<td></td>
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<tr>
<td></td>
<td>network.</td>
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<td></td>
<td>- The failure of</td>
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<td>one device usually</td>
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<td></td>
<td>does not affect the</td>
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<td>rest of the bus</td>
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<td>network.</td>
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<td></td>
<td>- Easy to connect</td>
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<td></td>
<td>a computer or</td>
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<tr>
<td></td>
<td>peripheral to a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>linear bus.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Requires less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cable length than a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>star topology.</td>
<td></td>
</tr>
</tbody>
</table>

**Disadvantages**

- If the switch fails, however, the entire network is inoperable until the device is repaired.
- Requires more cable length than a linear topology.
- If the hub, switch, or concentrator fails, nodes attached are disabled.
- More expensive than linear bus topologies because of the cost of the hubs, etc.
- The greatest risk to a bus network is that the bus itself can become inoperable.
- The network remains inoperative until the bus is back in working order.
- If more and more users join the network, problems in performance will arise.
- Entire network shuts down if there is a break in the main cable.
- Terminators are

- More difficult to install
<table>
<thead>
<tr>
<th>Situation</th>
<th>Used in home networks</th>
<th>Used in LAN networks (small offices and businesses)</th>
<th>Found in office buildings and school</th>
</tr>
</thead>
</table>
| A local area network (LAN) is a network that connects computers and devices in a limited geographical area such as homes.
| A wireless LAN (WLAN) is a LAN that uses no physical wires. A wireless LAN must have built-in wireless compatibility or the appropriate wireless network card.
| A wide area network (WAN) is a network that connects computers and devices from wide geographic areas (such as a city, country or the world) using a communications channel and covers a larger area than LAN networks. It can be one large network or consist of two or more LANs connected together. | Network Devices
| Network Interface Cards - The network interface card (NIC) provides the physical connection between the network and the computer workstation.
| Switches - A switch (advanced version of a hub) is a device that provides a central connection point for cables from workstations, servers, and peripherals.
| Repeater - Since a signal loses strength as it passes along a cable, it is often necessary to boost the signal with a device called a repeater.
| Bridges - A bridge is a device that allows you to segment a large network into two smaller, more efficient networks.
| Routers - Routers are the traffic directors of the global internet. All routers maintain complex routing tables which allow them to determine appropriate paths for packets destined for any address. Routers communicate with each other, and forward network packets out of or into a network.
| Firewall - A firewall is a networking device that is installed at the entrance to a LAN when connecting networks together, particularly when connecting a private network to a public network, such as the internet. The firewall uses rules to filter traffic into and out of the private network, to protect the private network users and data from malevolent hackers. | Protocols:
| TCP/IP (Transmission Control Protocol/Internet Protocol) is a protocol for communication between computers, used as a standard for transmitting data over networks and as the basis for standard internet protocols. The
The purpose was to allow computers to communicate over long distance networks.

- **HTTP (Hypertext Transfer Protocol)** is a client/server protocol that defines how messages are formatted and transmitted on the World Wide Web (the data transfer protocol used on the World Wide Web).
- **HTTPS (Hypertext Transfer Protocol Secure)** is a widely-used communications protocol for secure communication over a computer network, with especially wide deployment on the Internet.
- **SMTP (Simple Message Transfer Protocol)** is the main protocol used to send electronic mail on the Internet, consisting of rules for how programs sending mail should interact with programs receiving mail.
- **WAP (Wireless Application Protocol)** - a standard protocol for the transmission of electronic data between hand-held narrowband devices such as mobile phones and pagers and other sources of digital information such as the Internet.

### Transmission Media

<table>
<thead>
<tr>
<th>Media</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twisted-Pair Cables</td>
<td>More widely used transmission media for networking cabling and telephone systems. Consists of two separate insulated copper wires (wires are twisted together) to reduce noise.</td>
<td>Slow compared to fibre-optic cables.</td>
<td>Connects computer together in a small network, or connect computer over a wide area.</td>
</tr>
<tr>
<td>Coaxial Cable</td>
<td>Can be cabled over longer distances than twisted-pair cable.</td>
<td>Not as widely used</td>
<td>Used for television cables.</td>
</tr>
<tr>
<td>Fibre-Optic Cable</td>
<td>Capability of carrying significantly more signals than wire cables. Faster data transmission Less susceptible to noise (interference) from other devices such as a copy machine. Better security for signals during transmission (as they are less susceptible to noise) Smaller size (much thinner and lighter weight).</td>
<td>Costs more than twisted-pair or coaxial cable and can be difficult to install and modify.</td>
<td>Used as the backbone of a large business</td>
</tr>
<tr>
<td>Wireless</td>
<td>Mobility Cost (Inexpensive) Easy to set up Less resources</td>
<td>Security Speed Susceptible to interferences</td>
<td>A network that uses no wires.</td>
</tr>
</tbody>
</table>

### Factors Affecting the Speed of your Broadband Connection
- Your broadband plan
- Your computer (RAM)
- Your modem/router, filters and phone cable
The internet (not all websites will offer the same speed of download, no matter how fast your internet connection is).

- Internet traffic
- Your location (distance from the exchange)
- Weather conditions (rainy, windy)
- Other users downloading on the same connection

**Peripheral devices suited for industry requirements**

- **Computer aided manufacturing (CAM) lathes** - Computer-aided manufacturing (CAM) is the use of computer software to control machine tools and related machinery in the manufacturing of work pieces.
- **High speed photography for movement analysis** - High-speed photography is the science of taking pictures of very fast phenomena.

### Applications and systems software

- **Applications packages relevant to selected business/industry**
  - Application software - is software that helps/enables users to perform specific tasks on a computer.
  - Movement Analysis Software - Using high speed video cameras and motion analysis software, one can monitor and analyse assembly lines and production machines to detect inefficiencies or malfunctions.
  - Business Desktop Publishing - Desktop publishing software is the creation of printed materials using page layout on a personal computer. When used skilfully, desktop publishing software can produce printed writing with appealing layouts and typographic quality comparable to traditional typography and printing.

- **Techniques and skills to ensure smooth operation**
  - Techniques and skills to ensure smooth operation of software applications: Keep a PC running smoothly by not downloading malicious software, uninstalling old programs when performing program updates and not downloading software directly to a hard drive. Optimize a PC’s performance by removing files, like video players, that have several different versions already loaded on a computer with tips from a computer technician in this free video on computer software.

### Design acquisition of hardware and software

- **Compare and analyse software applications**
  - Some examples:

<table>
<thead>
<tr>
<th>Business Software</th>
<th>Microsoft Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>- Sleek</td>
</tr>
<tr>
<td></td>
<td>- Easy to use and simple to manage</td>
</tr>
<tr>
<td>User Interface</td>
<td>- Content is made more accessible by using placement and formatting.</td>
</tr>
<tr>
<td></td>
<td>- Easy page organisation</td>
</tr>
<tr>
<td>Functions</td>
<td>- Produce a variety of templates and documents.</td>
</tr>
<tr>
<td></td>
<td>- Editing options for text, images, tables, graphs</td>
</tr>
<tr>
<td>Technical Capabilities</td>
<td>- Can be saved as different file versions of the same Microsoft Office Word software</td>
</tr>
<tr>
<td></td>
<td>- Open Document Format</td>
</tr>
<tr>
<td></td>
<td>- PDF or XPS</td>
</tr>
</tbody>
</table>
### Applied Information Technology 2012 3AB Notes

| Configuration          | Processor: 500 MHz or faster  
|                        | RAM: 256 MB RAM, 512 MB recommended for graphic features  
|                        | HDD: 3.0 GB  
|                        | Display: 1024 x 576 or higher resolution monitor  
|                        | Windows 7  
|                        | Internet Explorer or other  

| Ease of Use            | Can be used by anyone with general knowledge of computers  
|                        | Employees do not need much training to use this software  

---

### Business Software

<table>
<thead>
<tr>
<th>Business Software</th>
<th>Google Docs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>- Design is appealing, not cluttered, easy to use,</td>
</tr>
<tr>
<td>User Interface</td>
<td>- User interface is basic, simple</td>
</tr>
</tbody>
</table>
| Functions         | - When you save a document, you can access it from any other computer (only software that provides this function)  
|                   | - Print Preview |
| Technical Capabilities | - Users are provided with 1GB of online storage space  
|                   | - Basic commands such as cut, paste, copy, undo, redo  
|                   | - Convert documents into PDFs, HTML,  
|                   | - Can open documents in seven different formats |
| Configuration      | - Requires an Internet connection  
|                   | - Supports Google Chrome, Firefox, Safari, IE  
|                   | - Enable cookies and JavaScript  
|                   | - Requires correct login information |
| Ease of Use        | - Very easy to manage with appropriate headings, |

---

### Microsoft Outlook

<table>
<thead>
<tr>
<th>Business Software</th>
<th>Microsoft Outlook</th>
</tr>
</thead>
</table>
| Design            | - Design can look confusing at first  
|                   | - Appealing and spaced out |
| User Interface    | - Users may find it difficult at first to use the software, however, after some time, they should be able to use it correctly |
| Functions         | - Used an email application  
|                   | - Can also be used a calendar, task |
Technical Capabilities
- Can render HTML
- Create polls, calendars
- Save documents as PDFs or XPS
- Create, receive, send emails and attachments

Configuration
- Processor: 500 MHz or faster
- RAM: 256 MB, 512 recommended
- HDD: 3.0 GB
- Display: 1024 x 768 or higher resolution monitor
- Windows 7

Ease of Use
- Effective spam filtering
- Integrates email, to-do lists, social networking updates into one
- Confusing to set-up
- Lacks useful templates
- Cannot create smart folders

- Constraints association with the acquisition an installation of a range of hardware components:
  - Compatibility between hardware components, e.g. newer graphics card put into older computer which contains old motherboard will not work.
  - Important to buy hardware components to suit the needs and minimum specifications of the software.

- SLA’s and Outsourcing
  - A service-level agreement (SLA) is part of a service contract where the level of service is formally defined.

Service-Level Agreement (SLA)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>- If used properly, the agreement is a win-win situation (both parties are benefited)</td>
<td>- Can lose profit depending on the type of SLA</td>
</tr>
<tr>
<td>- Minimises production costs</td>
<td>- Risk of failure</td>
</tr>
<tr>
<td>- If one party fails to uphold their service, the other party is compensated in some way</td>
<td>- Customers will have to wait a certain period of time for their services to be met</td>
</tr>
<tr>
<td>- Customers can call for tech support</td>
<td>- Customers or businesses lose money</td>
</tr>
<tr>
<td>- SLA is outlined in a clear contract</td>
<td>- Provider may not understand the business</td>
</tr>
<tr>
<td>- Ensures the quality to be benchmarking</td>
<td>- Often leads to dissatisfaction on one or</td>
</tr>
<tr>
<td>- Customers know what to expect if a conflict arises</td>
<td></td>
</tr>
</tbody>
</table>

- Outsourcing is the act of one company contracting with another company to provide services that might otherwise be performed by in-house employees.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Saves more money (outsourcing services are considerably cheaper)</td>
<td>- Eliminates direct communication between a company and its clients.</td>
</tr>
<tr>
<td>- Increased staffing flexibility</td>
<td>- This may prevent a company from building solid relationships with their customers.</td>
</tr>
<tr>
<td>- Outsourcing means receiving help from people with the right skills</td>
<td>- Often leads to dissatisfaction on one or</td>
</tr>
<tr>
<td>- Cuts the time needed to train staff into</td>
<td></td>
</tr>
<tr>
<td>Learning these work skills</td>
<td>Both sides.</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>- Leaves more time to focus on other things</td>
<td>- Danger of not being able to control some aspects of the company</td>
</tr>
<tr>
<td>- Time zone difference (outsourcing from other countries)</td>
<td>- Outsourcing may lead to delayed communications and project implementation.</td>
</tr>
<tr>
<td></td>
<td>- Hidden costs</td>
</tr>
</tbody>
</table>

Digital data and information

*The nature, forms and transfer of digital data*

- This uses your common sense, and general knowledge of bandwidth to relate it the client brief.
- Other:

<table>
<thead>
<tr>
<th>Factors associated and constraints in relation to data transfer</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor</strong></td>
<td><strong>Explanation</strong></td>
</tr>
<tr>
<td>Size</td>
<td>Depends on the size of the cabling and its capabilities such as coaxial cables. The size and distance between the network (home) and the exchange.</td>
</tr>
<tr>
<td>Time</td>
<td>On some parts of the day on a network line are the busiest because more users will be using the Internet whereas other parts are not as busy. Due to this, some ISP’s provide on-peak and off-peak times to change what times users use the Internet.</td>
</tr>
<tr>
<td>Cost</td>
<td>Generally, the more users pay for their broadband plan, the more data they will have and faster data transfers.</td>
</tr>
<tr>
<td>Resources</td>
<td>Some resources are given by the ISP such as modems or routers. This is more ideal because it is made specifically from the ISP and ensures that the resources will work properly. However, some ISP’s require customers to buy resources that fit their recommended range of products. This depends on the knowledge of networks for customers because they have to buy the resources themselves. Infrastructure of the network, cabling, the services, the wireless access points, the computer itself, Internet-enabled devices.</td>
</tr>
<tr>
<td>Security</td>
<td>Going over your download limit may lower your Internet speeds, need to protect your modem passwords.</td>
</tr>
<tr>
<td>Locality</td>
<td>If your network or home line is further away from the exchange, the weaker the data exchange and vice versa.</td>
</tr>
<tr>
<td>Access</td>
<td>Some areas are not suitable or have the satisfied requirements for broadband connections. This is known as the digital divide. Internet speeds are</td>
</tr>
</tbody>
</table>
generally faster on computers than on smartphones.

| Availability | Some areas are not located in places where broadband is offered. |

- **Curriculum dot points:**
  - issues related to rapid transfer of large volumes of data e.g. streaming media, outside broadcasts:
    - consider the intended audience
    - discuss the technologies required to organise, process, download, upload and store the data
    - compare the associated factors and constraints in relation to data transference with reference to size, time, cost, resources, security, locality, access, and availability

- **Quality Assurance**
  - Quality assurance, or QA for short, refers to a program for the systematic monitoring and evaluation of the various aspects of a service or faculty to ensure standards of quality are being met. It refers to as any action taken to prevent quality problems from occurring.
  - To implement systems for an organisation, you need to carry out three basic steps:
    - First - develop the system
    - Second - document it (this takes the form of policies, procedures, and reference information),
    - And Third - inform, instruct, and train staff to use it.

**Processing and managing data**

- **Industry management of data**
  - Disaster recovery refers to as the processes and procedures that are related to preparing for recovering to a business after a natural or human-induced disaster. If this happens, businesses would need to recover their client information as one of their main priorities.
  - Most common strategies used for data protection (disaster recovery):
    - Backups are made and sent off-site at regular intervals.
    - Backups are made on-site and automatically copied to an off-site disk.
    - Replication of data to an off-site location, which overcomes the need to restore the data. This process is known as the use of (SAN) technology.
    - High availability systems which keep both the data and system replicated off-site, enabling continuous access to systems and data.
    - Biometrics is the technology of authenticating a person’s identity by verifying a personal characteristic. This method of data protection is beneficial because each person’s DNA is unique and ensures that only those with authorisation can access the data. This can be achieved through the forms of the hair, skin, voice etc.
  - Data mining is the process that attempts to discover patterns in large data sets.
    - The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use.
  - Data warehousing combines data from multiple, usually varied, sources into one comprehensive and easily manipulated database.
    - Analysis can be performed to determine trends over time and to create plans based on this information for a range of purposes.
  - Data logging is the procurement of information in order to learn more about a process or system. It forms the basis of an understanding of a diverse range of systems.
- The logging and saving of information provides for increased knowledge and sometimes improved management of how and why different processes work.

**Processing of industry data**
- What is bandwidth?
  - The rate of data that can be processed by an Internet connection. The typical unit of measurement is bps (bits per second) or multiples of bits (i.e. kbps/mbps).
  - The amount of bandwidth that a computer connection is allotted determines how much data can be downloaded per second, or transferred from the Internet to the computer. More bandwidth equals more data per second, which translates to more speed.
- File Compression: A way of reducing the size of computer files usually by looking for repeated patterns of data in the original file and replacing them by codes.
  - The main reason for the many computer graphics file formats is their different methods of compression. Find out how the file formats compare and how to choose the right format for the best results.
- Encryption Methods:
  - Public-key encryption uses two different keys at once - a combination of a private key and a public key. The private key is known only to your computer, while the public key is given by your computer to any computer that wants to communicate securely with it. To decode an encrypted message, a computer must use the public key, provided by the originating computer, and its own private key.
  - Using a digital signature is a method that is used to ensure that an electronic document is authentic.

*Creative application of information design principles*
- Curriculum dot points:
  - apply information design principles in the creation and promotion of a corporate identity considering:
    - ICT solutions across a range of media to suit purpose and intended meaning
    - inclusivity
    - usability
    - currency and accuracy of data
    - evaluation of the effectiveness of the ICT solution against the design criteria.

**Workplace, practices and careers**

*Careers, works and jobs*
- In 3A Notes
- Others
  - Globalisation is the process by which the world is becoming increasingly interconnected as a result of massively increased trade and cultural exchange. It has increased the production of goods and services.
  - Reasons for globalisation: improvements in transportation, improvements in communications, freedom for trade and labour availability and skill.

*Work environments and legislation*
- Working overseas may provide better opportunities because different countries offer different types of work.
• Australians will be competing with other countries for employment who may work for cheaper wages.
• The ‘One Job For Life’ theory suggests that employees stick with one career in their life time. However, in some cases, this is not true. Many people change jobs throughout their life. “The trend looks set to continue, with one in five of the 2,000 workers surveyed thinking about changing jobs over the next year. Half of those looking for a new job said money was the main reason, although other workers wanted a new challenge or change in career.”

**Technology processes in the workplace**

• Methods on how to maintain an employee’s ICT skills:
  o Go to university or school
  o Job training
  o Bulletin boards
  o Watch tutorials
  o Attend ICT teaching lessons
  o Buy a book
  o Go on online blogs and forums

**References:**
• Divyan’s Notes (With permission)
• Martin’s Notes (With permission)
• Encarta Dictionary Online