AIT NOTES

Table of Contents

[**TERM 1 WEEK 1 (DESIGN CONCEPTS) 3**](#_heading=h.gjdgxs)

[*ELEMENTS OF DESIGN 3*](#_heading=h.30j0zll)

[*PRINCIPLES OF DESIGN 4*](#_heading=h.1fob9te)

[*RELATIONSHIP BETWEEN ELEMENTS AND PRINCIPLES OF DESIGN 5*](#_heading=h.3znysh7)

[*TYPOGRAPHY 5*](#_heading=h.2et92p0)

[*COMPOSITIONAL RULES 5*](#_heading=h.tyjcwt)

[*FEATURES OF A USER INTERFACE 6*](#_heading=h.3dy6vkm)

[**TERM 1 WEEKS 2-3 (HARDWARE) 8**](#_heading=h.1t3h5sf)

[*SPECIFICATIONS OF DIGITAL DEVICES AND THEIR IMPACT UPON USABILITY 8*](#_heading=h.4d34og8)

[*CHARACTERISTICS OF DEVELOPMENT TRENDS IN EMERGING MOBILE DEVICES 9*](#_heading=h.2s8eyo1)

[*SUITABILITY OF EMERGING MOBILE DEVICES TO MEET CLIENT (USER) NEEDS 10*](#_heading=h.17dp8vu)

[*USABILITY OF DIGITAL DEVICES FOR SPECIFIED CLIENT REQUIREMENTS 11*](#_heading=h.3rdcrjn)

[**TERM 1 WEEK 4 (IMPACTS OF TECHNOLOGY) 11**](#_heading=h.26in1rg)

[*THE CONCEPT OF IP 11*](#_heading=h.lnxbz9)

[*INTENTION AND PURPOSE OF IP IN AUSTRALIA IN RELATION TO COPYRIGHT AND/OR DESIGN OF DIGITAL PRODUCTS 11*](#_heading=h.35nkun2)

[*THE CONCEPT OF ONLINE DEFAMATION IN AUSTRALIA 11*](#_heading=h.1ksv4uv)

[*LEGAL ACTION AVAILABLE IN AUSTRALIA TO COUNTERACT ONLINE DEFAMATION 12*](#_heading=h.44sinio)

[*THE CONCEPT OF FREEDOM OF INFORMATION (FOI) IN AUSTRALIA 12*](#_heading=h.2jxsxqh)

[*KEY PROVISIONS OF FOI IN AUSTRALIA IN RELATION TO DIGITAL PRODUCTS 12*](#_heading=h.z337ya)

[*ADVANTAGES, DISADVANTAGES AND IMPLICATIONS OF VIRTUAL AND PHYSICAL COLLABORATION 12*](#_heading=h.3j2qqm3)

[*IMPACT OF CONVERGENCE TRENDS IN CONTEMPORARY DIGITAL TECHNOLOGIES 13*](#_heading=h.1y810tw)

[**TERM 1 WEEK 5 (PROJECT MANAGEMENT) 13**](#_heading=h.4i7ojhp)

[*PROJECT MANAGEMENT APPROACHES 13*](#_heading=h.2xcytpi)

[*PROJECT PLANNING TOOLS 15*](#_heading=h.1ci93xb)

[*APPEARANCE CONSIDERATIONS FOR A DIGITAL PRODUCT AND/OR DIGITAL SOLUTION 16*](#_heading=h.3whwml4)

[**TERM 1 WEEK 6 (APPLICATION SKILLS) 17**](#_heading=h.2bn6wsx)

[*SOUND APPLICATION FEATURES 17*](#_heading=h.qsh70q)

[**TERM 1 WEEKS 7-8 (APPLICATION SKILLS) 17**](#_heading=h.3as4poj)

[*ONLINE SOFTWARE TOOLS 17*](#_heading=h.1pxezwc)

[*VIDEO APPLICATION FEATURES 17*](#_heading=h.49x2ik5)

[*PUBLISHING FEATURES 18*](#_heading=h.2p2csry)

[*TYPES OF DIGITAL PUBLICATIONS 19*](#_heading=h.147n2zr)

[*ADVANTAGES AND DISADVANTAGES OF DIFFERENT TYPES OF DIGITAL PUBLICATIONS 19*](#_heading=h.3o7alnk)

[**TERM 2 WEEK 1 (MANAGING DATA) 20**](#_heading=h.23ckvvd)

[*CONCEPT OF USER-GENERATED CONTENT 20*](#_heading=h.ihv636)

[*ADVANTAGES AND DISADVANTAGES OF USER GENERATED CONTENT 20*](#_heading=h.32hioqz)

[*CONCEPT OF HYPERTEXT MARK-UP LANGUAGE (.HTM/.HTML) 21*](#_heading=h.1hmsyys)

[*PURPOSE OF WORLD WIDE WEB CONSORTIUM (W3C) 21*](#_heading=h.41mghml)

[*PURPOSE OF W3C CONVENTIONS 21*](#_heading=h.2grqrue)

[*PURPOSE OF THE WEB DESIGN AND APPLICATIONS STANDARD FROM THE W3C STANDARDS 22*](#_heading=h.vx1227)

[*VALIDATION TECHNIQUES FOR ONLINE FORMS 23*](#_heading=h.3fwokq0)

[*ANALYSE SOURCES OF INFORMATION FOR VERIFIABILITY, ACCURACY AND CURRENCY 23*](#_heading=h.1v1yuxt)

[**TERM 2 WEEKS 10-11 (MANAGING DATA) 24**](#_heading=h.4f1mdlm)

[*SECURITY TECHNIQUES FOR THE MANAGEMENT OF DATA 24*](#_heading=h.2u6wntf)

[*TYPES OF BACKUP TECHNIQUES AND ARCHIVING OF DATA 24*](#_heading=h.19c6y18)

[*ONLINE DATA STORAGE METHODS 25*](#_heading=h.3tbugp1)

[*PURPOSE OF DATA MINING 25*](#_heading=h.28h4qwu)

[*PROCESSING OF DATA CONSIDERING SECURITY OF DATA THROUGH THE USE OF 26*](#_heading=h.nmf14n)

[*CONCEPT OF WEB 2.0 AND WEB 3.0 27*](#_heading=h.37m2jsg)

[*PURPOSE AND FEATURES OF CONTENT MANAGEMENT SYSTEMS (CMS) 29*](#_heading=h.1mrcu09)

[**TERM 3 WEEKS 1-4 (NETWORKS) 29**](#_heading=h.46r0co2)

[*TYPES AND CHARACTERISTICS OF COMMUNICATION PROTOCOLS 29*](#_heading=h.2lwamvv)

[*TYPES AND CHARACTERISTICS OF COMMUNICATION STANDARDS 30*](#_heading=h.111kx3o)

[*TYPES OF NETWORK SECURITY MEASURES 30*](#_heading=h.3l18frh)

[**TERM 3 WEEKS 5-6 (IMPACTS OF TECHNOLOGY) 31**](#_heading=h.206ipza)

[*DATA AND INFORMATION SECURITY RELATED TO PERSONAL OR SENSITIVE INFORMATION 31*](#_heading=h.4k668n3)

[*PURPOSE OF A CODE OF CONDUCT 31*](#_heading=h.2zbgiuw)

[*ELEMENTS OF A CODE OF CONDUCT 31*](#_heading=h.1egqt2p)

[*ONLINE CENSORSHIP OF INFORMATION IN A GLOBAL CONTEXT 33*](#_heading=h.3ygebqi)

[*ISSUES WITH THE USE OF CLOUD COMPUTING 33*](#_heading=h.2dlolyb)

[*IMPACT OF DIGITAL TECHNOLOGIES AND GLOBAL MARKETS ON: 34*](#_heading=h.sqyw64)

[*IMPACT OF WEB 2.0/WEB 3.0 ON THE USE OF DIGITAL TECHNOLOGIES 35*](#_heading=h.3cqmetx)

[**TERM 3 WEEKS 7-8 (APPLICATION SKILLS and PROJECT MANAGEMENT) 36**](#_heading=h.1rvwp1q)

[*CONCEPT OF SERVICE LEVEL AGREEMENTS 36*](#_heading=h.4bvk7pj)

[*FEATURES OF SERVICE LEVEL AGREEMENTS 36*](#_heading=h.2r0uhxc)

[*ADVANTAGES OF LOCAL AND GLOBAL OUTSOURCING COMPARED WITH IN-HOUSE PRODUCTION 37*](#_heading=h.1664s55)

[*PURPOSE OF OUTSOURCING DATA MANAGEMENT 37*](#_heading=h.3q5sasy)

[*EVALUATION OF SOFTWARE, INCLUDING USABILITY 37*](#_heading=h.25b2l0r)

recap - basic file formats:

vector:

* .svg = web
* .cgm = engineering

audio:

* .aac = high quality = lossy
* .mp3 = highly supported = lossy

raster:

* .png = lossless = web
* .tif = high res = lossless

# TERM 1 WEEK 1 (DESIGN CONCEPTS)

## ELEMENTS OF DESIGN

LINE

* any actual or implied line in an image
* Lines can be used to create various principles

Consider the following examples:

Leading Lines – can be used to draw the eye to specific locations on the image

Implied Line – can be created using the aligning edges of shapes

SHAPE

* Shapes used within the image
* may be regular or irregular

SPACE

* The arrangement of the elements in an image and their visual relationship with one another and the boundary of the image
* Are the elements all crowded to one side? Are they aligned? Is there a use of negative space?

TEXTURE

* The use of detailed images showing texture within an image to generate a feeling of roughness (or smoothness as the case may be)

COLOUR

* The use of colour within an image
* In IT terms, we can consider various colour identification schemes
  + RGB: red, green, blue
  + CMYK: cyan, magenta, yellow, key (black)
  + HSV: hue, saturation, value

3D FORM

* The use of 3D CAD elements within a computer-generated image to generate a more authentic and realistic feel

TONE

* Often called contrast, this describes the variation between the dark and light areas of an image

## PRINCIPLES OF DESIGN

BALANCE

* The arrangement of elements in an image can be used to distribute the visual weight of the image, clustering of elements in one area will make that area heavy
* Often balance is confused with symmetry, however balance can be achieved without symmetry.

EMPHASIS

* Principle where various elements are combined to make a certain part of the image stand out visually
* Tone or contrast, size, proportion and the use of colour are common ways of generating emphasis

DOMINANCE

* The use of elements to make a part of an image overpower other parts of the image
* Dominance is commonly used in pictographs by using size to differentiate different values

UNITY

* The tendency of an image to look consistent
* The use of elements that mesh with each other using repetition of a shape, colour, use of space and/or size
* A unified image looks like it fits and is usually considered to be conservative.
* Designers often use deliberate removal of unity to create post-apocalyptic, grungy or distressed looks

PATTERN

* The arrangement of a variety of elements to create a repeating pattern of colour, shape, line texture etc.

MOVEMENT

* The use of elements of design to represent movement in an image
* One example is the use of leading lines to draw the eye to a certain point on an image, the addition of speed lines to an image to suggest that something is moving quickly is another example.

## RELATIONSHIP BETWEEN ELEMENTS AND PRINCIPLES OF DESIGN

Elements: things you put on a page = physical additions

Principles: abstract concepts that are constructed using elements of design

* The parts or components within a design that can be individually defined.
* Together the elements of design constructs the principles of design
* They provide the basic structure for the product and are responsible for communicating the design intentions
* The placement of the elements of design can alter the message communicated

## TYPOGRAPHY

TYPEFACE

* The actual shape of letters used to create text
* Many people confuse the term font for typeface
* Font includes typeface, colour, size, bold/italic options etc.

TEXT SIZE

* Text size is measured in points
* When digital products are created, the text size is often related to the resolution of the image, rather than the perceived visual size
* This must be taken into account during construction

ALIGNMENT

* identifies the position of text on a line, good alignment can make a text easier and more pleasant to read

TEXT FORMAT

* refers to the various visual adjustments that may be made to text in a design
* includes typeface, text size, text, colour, text spacing, text alignment, bold, italic, underscore, subscript, superscript – basically any options that is available in the font/character editing menu

TEXT SPACING

* The use of the element space in relation to text elements
* includes space between letters (kerning and tracing) space between lines (leading)

## COMPOSITIONAL RULES

READING GRAVITY

* refers to the tendency of Western writing to cause the reader’s eye to scan from the top left corner of the page to the bottom right corner.
* According to this compositional rule, the most important information should be placed upon this diagonal, starting with the most important information at the top left, moving towards the least important on the bottom right.
* The top right and bottom left corners are considered to be “dead areas” and should not be used to hold important content (according to this rule)

RULE OF THIRDS

* The rule of thirds developed from photographic composition.
* According to this rule, the image should be divided into thirds, both horizontally and vertically
* Important information should be placed upon the lines separating these thirds.
* Areas where two third-lines cross are considered to be especially powerful.

FORM OF CONTENT

* In design the two terms form and content relate to the two main aspects of a design

Form – the form is also known as the style or the appearance, it describes the way a design looks. Assessing form involves consideration of Elements and Principles along with any other design considerations

Content – is the actual copy that is included in the design. What does the design contain? Content is the information without consideration of any stylistic elements.

Form of content is a concept that considers the form in which the content is displayed in a design. Is the form appropriate to the content? Does the form detract from any aspect of the content?

* Whatever you have, presented appropriately

GRID AND ALIGNMENT

* describes the practice of mapping designs with reference to a strict, invisible grid structure
* This technique is used to generate formal, businesslike designs with a high degree of structure.
* Alignment refers to the practice of lining things up in a design. Obviously gridding a design will involve alignment, but alignment allows for a varying level of structure to be used in a design

## FEATURES OF A USER INTERFACE

LOGICAL AND HIERARCHICAL ORGANISATION OF CONTENT

* when creating a digital product or digital solution it is important to arrange content logically
* Users can be put off by poor arrangement and organisation of content
* when users encounter digital solutions:
  + they expect to be able to pick and choose the content they see
  + and they will become frustrated and disengaged if they are presented with content that they don’t find relevant
* to overcome this, most designers will implement a hierarchical organisation method where the content is broken up into progressively more detailed categories
* Network Maps are commonly used to undertake this process.

GRAPHICAL USER INTERFACE (GUI) SUITABLE FOR TARGET AUDIENCE

User Interface: the term used to describe the methods, paradigms and structures with which a user interacts with a system

GUI: Graphical User Interfaces utilise graphical, rather than textual, methods to provide an interface

Key features of a GUI might be:

* Windows
* Scrollbars
* Menus
* Mouse or Touch control
* etc.

They are intended to be more user friendly and intuitive, making control of the system more usable (see usability)

RELEVANT HELP FEATURES OF A GRAPHICAL USER INTERFACE

* GUIs usually come with various help features to assist users in the process of controlling a system
* Often used are:
  + Tooltips
  + Rollover icon changes
  + Help Menuing systems
  + Visual tutorials

Usability

* about designing products to be effective, efficient, and satisfying
* includes user experience design
  + This may include general aspects that impact everyone and do not disproportionally impact people with disabilities
* Usability practice and research often does not sufficiently address the needs of people with disabilities.

<https://www.w3.org/WAI/fundamentals/accessibility-usability-inclusion/>

Inclusivity

* the tendency of a system to be available to multiple, disparate people groups
* ensures a system is usable by people with different abilities, cultural backgrounds, economic situations, locations etc.
* inclusivity is a designer’s response to an awareness of the Digital Divide

Accessibility

* Accessibility is the tendency of a system to be available to be used by people who have a disability
  + many digital systems require additional features to be accessed by the visually or hearing impaired
* There is a set of Accessibility standards which allow digital systems to interface with text reading hardware, and other systems to enhance accessibility.

# TERM 1 WEEKS 2-3 (HARDWARE)

## SPECIFICATIONS OF DIGITAL DEVICES AND THEIR IMPACT UPON USABILITY

The specifications of Digital Devices are the values used to identify the device’s capability.

Broadly, this can be grouped fairly narrowly.

CPU, Primary Memory and Secondary Memory are the really important specifications, but others might be pertinent to specific tasks

* A device’s specifications should be matched to the task required of it
* To exceed the specifications required would cost more without realising any value, to undervalue the specifications will mean the device is unlikely to efficiently perform the task
* Various tasks have different needs
  + for example, video editing involves handling large files, but doesn’t require complex processing, therefore if you will be mainly editing video, you should focus on a system that has high memory (RAM and Storage)
  + however, 3D rendering requires millions of complex calculations and therefore you should spend your money on a high-spec CPU, with possibly RAM
  + gaming computers typically stress all areas of the system, so computer game nuts will buy the biggest and best computer they can afford.

Computer system specifications will impact on the usability of a system for specific tasks.

Various tasks impose stress upon different hardware and software components of a computer

* Calculation tasks: require a computer with computation power, hence a more powerful processor
* Tasks involving large files: such as video editing tasks or large image processing tasks require more Primary Memory
* Tasks involving the storage of a large number of files: such as webservers, file servers or some types of database require more Secondary Memory
* There are many tasks which require improved specifications within several areas

It is the job of the ICT professional to be aware of the requirements of the task and match specifications to this task.

## CHARACTERISTICS OF DEVELOPMENT TRENDS IN EMERGING MOBILE DEVICES

Development trends in emerging mobile devices: This concept is all about how mobile devices are changing now and in the future

Traditionally, these development trends follow really specific specifications-based areas. Things such as:

* CPU power
* Device Size
* Memory (both Primary and Secondary)
* Screen Resolution

Of late, however some interesting trends have emerged which don’t follow traditional lines

* Use of biometric security
* Voice activation and control
* Number of cameras (for some unknown reason)
* Other things

Device size is a really interesting aspect to consider when discussing trends in emerging mobile devices, phones, laptops and tablets seem to be moving towards one generic size paradigm, with tablets and laptops moving towards very similar specifications, and phones getting increasingly larger

* A current iPhone 12 has a larger screen than the first-generation Galaxy Note (which was marketed as a mini-tablet, rather than a phone)
* One really interesting thing that Samsung are working with is the return to the “flip phone” with some attempts being made to increase screen size and resolution without impacting device size.

Usually, these trends are started by one company making an innovation that is popular with the public, the other companies seeing that they lose market share as a result and then competing to replicate or improve on that feature

* This is where the camera fight started the multi-lens camera which launched this fight was the LG G5, which had 1 16Mp standard format lens paired with a second 8Mp Ultra-Wide Angle lens
* HTC, Apple, Huawei and Samsung rapidly introduced multi lens devices themselves, with the Samsung Galaxy A9 boasting FOUR!

In the early years of development across all categories, the focus was on size reduction. All three categories started as bulky options with limited capabilities, developers weren’t able to do much about the capabilities, but they could work on making devices smaller, lighter and more portable.

At a certain point in development, each device started to focus on screen size and quality. (the release of the iPhone in phones)

Phones are interesting, because they very rapidly changed from promoting the “smallness” of the device to promoting the “largeness” of the screen

Connectivity and device power were pretty much next, with the continuing development of Bluetooth, developers used this wireless connection to attach all sorts of peripherals wirelessly.

So……what are the current and emerging trends? To figure this out, you need to look at the development of recent devices and try to extrapolate this into the future

One trend I would look at is the development of camera technology. Everybody is looking for the best camera option (particularly in a wide range of tasks/formats) (iPhone now has 3 lenses to manage different photography tasks)

I believe this development will continue, but there is already beginning to be consumer backlash to the ridiculous development of festooning the back of your phone with multiple lenses

Either some form of adaptive lens technology will be used, or improved digital processing techniques will eventually see the problem solved in other ways. I also see that the formats and capabilities of devices are converging, Laptops are becoming more like super tablets with a keyboard

Cloud services are being used more consistently for storage and specifications are becoming similar. I believe this blur of the lines will continue until there isn’t a distinction between Tablets and Laptops. Phones will probably still occupy their own space due to the requirement of being carried everywhere you go, but the only real difference will be the screen size

## SUITABILITY OF EMERGING MOBILE DEVICES TO MEET CLIENT (USER) NEEDS

Due to the characteristics of development trends in emerging mobile devices, devices vary in their suitability to meet user needs

There’s no point in having massive computational power in a mobile device if user tasks predominantly require Primary Memory

However, there is a definite aspect by which the way a user utilises a device changes depending on the capabilities of that device

For instance, nobody thought of using a phone to capture images before phones were supplied with cameras, now that cameras are ubiquitous, it’s difficult to consider life without a camera phone in your pocket

## USABILITY OF DIGITAL DEVICES FOR SPECIFIED CLIENT REQUIREMENTS

(usability notes are above)

Usability is the degree of ease with which products such as software and Web applications can be used to achieve required goals effectively and efficiently

Usability assesses the level of difficulty involved in using a user interface evaluate computer system specifications for usability

Can various digital devices be used in specified client tasks? Can you use a phone to write a university assignment? Can you edit a professional video on a tablet? Can you process scientific data on a laptop?

# TERM 1 WEEK 4 (IMPACTS OF TECHNOLOGY)

## THE CONCEPT OF IP

Intellectual property is defined as “Intellectual property (IP) is the property of your mind or proprietary knowledge

* It is a productive new idea you create
* This can be an invention, trademark, design, brand or even the application of your idea.” (IP Australia) IP refers to any original idea in any form.

## INTENTION AND PURPOSE OF IP IN AUSTRALIA IN RELATION TO COPYRIGHT AND/OR DESIGN OF DIGITAL PRODUCTS

Intellectual property legislation is intended to protect the originator of an idea from exploitation

There are several legal protections that relate to IP

* Copyright
* Trademarks
* Patents

The legal protections offer differing levels of registration and protection for an idea

## THE CONCEPT OF ONLINE DEFAMATION IN AUSTRALIA

Defamation in an online context is difficult to define and even more difficult to police

In a broad sense, defamation is the spreading of false information which damages somebody’s reputation

As is easy to see, this applies very directly to online communities that are often populated by:

* Trolls
* Cyberbullies
* And catfishers

One of the difficulties with traditional defamation understandings is that they’re based in an understanding that the originator of the false information is easily identifiable, however this can be difficult in the online world.

## LEGAL ACTION AVAILABLE IN AUSTRALIA TO COUNTERACT ONLINE DEFAMATION

Online Defamation is not specifically legislated in Australian Law and therefore we must rely upon traditional legal constructs such as Libel, Slander and General Defamation

If you are being defamed online, you can take legal action in Civil Court for Defamation

If the statements which you claim to be defamation are found to be inaccurate and damage your reputation or incur a cost for you, you can be awarded financial damages

## THE CONCEPT OF FREEDOM OF INFORMATION (FOI) IN AUSTRALIA

The Freedom of Information Act gives individuals the right to access information held in Government documents

## KEY PROVISIONS OF FOI IN AUSTRALIA IN RELATION TO DIGITAL PRODUCTS

The FOI act gives you the right to request access to government documents

In the majority of cases, this access is requested as the document contains information about the person requesting access, however access can also be requested on the grounds that the document contains information about:

* Government Policies
* Programs
* Decision Making Processes

## ADVANTAGES, DISADVANTAGES AND IMPLICATIONS OF VIRTUAL AND PHYSICAL COLLABORATION

Collaboration is the act of communicating between people to accomplish a set purpose

Collaboration can happen physically (face to face) or virtually (using digital resources such as video conference, shared workspaces or social media tools)

Physical Collaboration

| Advantages | * Reliable * Unlikely to cause misunderstanding |
| --- | --- |
| Disadvantages | * Costly (airfares, travel time) * Can impact other aspects of the collaborators’ work |

Virtual Collaboration

| Advantages | * Cheap * Doesn’t require travel * Doesn’t disrupt workflow |
| --- | --- |
| Disadvantages | * Can be affected by network connection * Cultural differences can cause misunderstanding due to insufficient information * Requires significant ICT Infrastructure |

## IMPACT OF CONVERGENCE TRENDS IN CONTEMPORARY DIGITAL TECHNOLOGIES

Convergence: Digital convergence is the tendency of manufacturers to create products which combine the abilities of multiple products

For example, once printers and scanners were separate devices, now, for the most part they are combined

Your smartphone is a convergence of Phone, Web Browser, Personal Organiser, Camera, Media player

This has various impacts upon society:

* the prices of individual products increase
* complexity of use increases,
* connection to Internet is required
* etc.

It is clear that convergence trends have significant impacts on the ways people interact with technology and with the world

Smartphones, for example have caused mobile phones to transition from being an intermittently used device upon which we only made phone calls to personal social centers where we conduct the important business of life

These devices sometimes are used in preference to direct interaction with those around us.

# TERM 1 WEEK 5 (PROJECT MANAGEMENT)

## PROJECT MANAGEMENT APPROACHES

PROTOTYPE

A prototype project management approach involves creating a semi-functional sample of the product (prototype) and undertaking structured refinement of the prototype

Prototyping is common in research and development workshops where innovation and creative thinking is valued more highly than strict timeframes.

Advantages:

* not constrained by traditional issues such as finance, time, conservative thinking
* able to create products that require “out of the box” thinking
* an example of the product is created quickly for the client to respond to
* tends to make more efficient use of human resources, allowing workers to spend more time working in their areas of expertise
* workers feel more engaged and excited by the work

Disadvantages:

* Can be costly both in wasted resources and time
* Clients may get frustrated after seeing a prototype that looks virtually complete to them but requires significant further work
* Easy to focus too much energy on a component that doesn’t deliver enough benefit to warrant the energy
* can lose track of the original intent of the project and morph into a product that is not what was originally intended

STRUCTURED

Structured project management strategies are most familiar to you

They involve a highly ordered and organised design process which follows a consistent cycle of steps to generate a product:

* Investigation/Conceptualisation
* Specification
* Design
* Construction
* Evaluation/Review

Often the team will evaluate the product after the design phase and return to investigation or design

This process is very common to conservative design companies because:

* it is very ordered and structured, allowing managers a high level of control
* It creates stringent specifications and contracts which can be used to ensure that clients pay for the services rendered
* It is easy to identify construction timeframes, because the final design proposal isn’t varied after client sign-off

R&D-oriented companies and many innovative organisations avoid structured or “waterfall” development in favour of prototype or “agile” development because structured systems:

* Don’t respond well to rapidly changing requirements
* Don’t effectively utilise the ideas of every team member
* Can be seen as controlling by low level team members

## PROJECT PLANNING TOOLS

STORYBOARDS

A storyboard is a sequence of panels which contain a layout sketch accompanied by explanatory notes that describes in detail the structure and storyline of a linear visual product (such as a video or animation)

* usually describes the major points of the storyline in the product as scenes become more important, the number of panels devoted to that scene will increase.

SITEMAPS

A sitemap is a graphical representation of the pages and connections within a digital product

* Typically applied to websites, the sitemap is a design development tool that enables the developer to identify the number of pages in a site and the ways in which those pages hyperlink to each other

The organisational chart tool in Word is a handy way to draw a rudimentary sitemap, however as the site becomes more complex, you will need a more advanced tool.

Building a sitemap before you draw layout sketches and storyboards will save you time, since you already have an idea how your information will be organised, and you are less likely to create pages unnecessarily

FLOW CHARTS

A flow chart is a graphical abstract representation of the coding algorithm used to solve a particular programming problem

* Useful when creating abstract scripts for complex apps, they help the developer design the logic flow of code.

GANTT CHARTS

A GANTT chart is a graphical tool used to plan and track the completion of tasks within a complex project

* It consists of horizontal cells representing either a task or a worker, these cells are shaded to indicate the planned time for working on a task
* When task dependency is planned properly it can be seen where there is “slack time” which might allow for workers to be reassigned to help out with mission critical tasks

PROJECT MANAGEMENT SOFTWARE

Project management software is application software that is intended for project managers to use to handle the many complex tasks required to keep a project running smoothly and efficiently

* They usually include scheduling tools, communication tools etc. a (not exhaustive) list of project management applications can be found in this article

## APPEARANCE CONSIDERATIONS FOR A DIGITAL PRODUCT AND/OR DIGITAL SOLUTION

STRUCTURE

The structure of a digital product is very important

structure defines the physical arrangement of the various items within a solution

when considering a website, the structure is often designed using a Site Map or a Network Map

If products are structured well, there will be an intuitive and efficient flow of information, if they are structured poorly, the frustration with finding the information you need might cause users to give up (rage quit)

USABILITY

(usability notes are above)

ACCESSIBILITY

(accessibility notes are above)

USER EXPERIENCE (UX)

UX is the term used to define the overall experience the user feels when using a product

UX may take into account:

* the UI
* the Structure
* the complexity of content the design elements and principles

UX can often be expressed using abstract terms

* It isn’t uncommon to describe a UX using emotive terms such as “friendly” or “aggressive”.

In much the same way as Principles are made up of elements, UX is made up of a range of considerations.

USER INTERFACE (UI)

The user Interface is the actual items that a user interacts with in a system.

* Example: A car's user interface includes a steering wheel, which the user uses to control direction, brakes and accelerator which the user uses to control speed and a speedometer, which the user uses to identify at which speed the car is travelling.
  + Like this excessively simplified example, digital systems have interfaces that enable user interaction

Menus, Buttons, Display Screens etc are all components of a user interface

# TERM 1 WEEK 6 (APPLICATION SKILLS)

## SOUND APPLICATION FEATURES

Sound applications have similar features to video editing applications, the ability to cut and paste, apply effects, import, export and Multi-Layer Track Editing.

AUDIO EFFECTS

Audio effects can be added to a file, clever manipulation of audio effects can cause a sound to change completely

MULTI-LAYER TRACK EDITING

The ability of a multimedia editing application to edit files using multiple tracks upon which content can be placed, enabling multiple videos or sounds to be visible/audible at the same time in the finished product

Various effects are used to blend the tracks to achieve a pleasing result.

Timelines typically look like this:

Graphical user interface, application, website

Description automatically generated

# TERM 1 WEEKS 7-8 (APPLICATION SKILLS)

## ONLINE SOFTWARE TOOLS

Online software tools are tools that can be used in a solely online environment. They can be thought of as “web apps” and include things such as Google Docs. The power and variety of online tools continues to improve rapidly.

## VIDEO APPLICATION FEATURES

MULTI-LAYER TRACK EDITING

(multi-layer track editing notes above)

TITLES

Titles are generally implemented as overlays onto a video feed, using the power of the multi-layer system to create various effects. Titles may be still or scrolling, may include images, some even include video or animation

TRANSITIONS

Transitions are animations which are used to create interest when the slideshow is moving from slide to slide. Transitions can be found on the Transitions menu and they may be added to individual slides or copied to every slide in the presentation.

EFFECTS

Audio effects can be added to a file. Clever manipulation of audio effects can cause a sound to change completely. This documentary gives a good insight into the importance of audio effects

## PUBLISHING FEATURES

COLOUR SCHEMES

Publishing Software typically comes with pre-built colour schemes available so that inexperienced designers can rapidly select colour schemes that are attractive and based upon excellent colour theory

If you look at the “design” tab in Microsoft Word, you will see the Colour Scheme selection tool. It is possible for users to build and save their own colour schemes

LAYERS

Layers are the property of an editing solution to have several areas set aside for more than one object to occupy the same space

Usually layers are utilised to ensure editing of one object doesn’t interfere with the appearance of another object, however layers may be cleverly used employing tools such as transparency to generate advanced effects.

FRAMES

Frames are typically identified as part of a video project

A frame is a single cell in an animation, just like in the olden days, when cells were hand drawn and photographed to be replayed in rapid succession to generate the appearance of movement, frames in software packages utilise the same concept.

TYPOGRAPHY

(typography notes are above)

TEMPLATES

Many web authoring systems (WordPress, Wix, Weebly) offer templates which can be used to reduce the development time for a website

Since many design decisions are already made for the developer they are an easy and quick way to begin the process. Templates limit developers, since they are often written in complex ways to allow them to perform out-of-the-ordinary actions and therefore templates can be difficult to modify.

PRINT/DISPLAY OPTION

The Print/Display option is all about controlling the output of the final product

modern publication software allows for several options in output, ranging from print on a desktop printer to websites, and even sometimes video or other formats. Various options within each publication type give the user further control of the output.

## TYPES OF DIGITAL PUBLICATIONS

* Digital publication usually branded by a company e.g. PDF by Adobe
* Software app used to deliver content
* Look and styled to belong to a brand.
* ePub used by many publishing programs for mobile devices

## ADVANTAGES AND DISADVANTAGES OF DIFFERENT TYPES OF DIGITAL PUBLICATIONS

ePub (electronic publication)

Advantages:

* ePub is delivered as one zipped file
* when opened on small devices are easy to unpack and easy to layout on the screen
* Very user friendly and can be opened easily on many devices.
* Not owned by a large corporation, large market

Disadvantages:

* Creating or making an ePub document is not easy to do.
* Creating the zip archive for publishing is also difficult

PDF (portable document format)

Advantages:

* Can be opened by most computers
* Gives you control over the layout and fonts.
* They can be made by many different pieces of software. Word, Excel, Powerpoint., Pages and lots more
* The reader software for PDF is free. Adobe Reader.
* It used to be safe as it was difficult to modify. ie your document couldn’t be changed.
* Easy to attach to email and upload to websites without trouble

Disadvantages:

* PDFs can sometimes not display correctly on smaller screens such as smartphones
* It is not free to edit PDFs. You need to buy software to do this
* Editing PDFs is not easy. It is much easier to edit a word or pages document

INDD (InDesign document)

Advantages:

* Easy to export to a variety of formats, especially PDF for printing
* Very powerful package that can make a single A1 size page to print for a large poster, or can make a 1000-page book
* You can modify image sizes within inDesign

Disadvantages:

* It is expensive
* Can be a bit difficult to learn at first

# TERM 2 WEEK 1 (MANAGING DATA)

## CONCEPT OF USER-GENERATED CONTENT

User Generated Content is all about website users being the ones who provide the information that populates webpages

In Web 1.0, web developers made static pages that displayed only the text and images that they coded for them. To make changes to what the website displayed, you needed a web designer to log into the backend and make the changes you request.

Web 2.0 describes the development trend where Web Developers made framework websites such as WordPress, Facebook, Twitter or Wix (including many more) and the users filled it with their own content

## ADVANTAGES AND DISADVANTAGES OF USER GENERATED CONTENT

Advantages:

* more information is available
* this information is now categorised, so it is easier to find, e.g. different blogs
* review of products helps people looking to buy that product, or not
* huge advantage for business if they can get the public involved in their company, more profit for business
* keeps a website up to date
* provides free content when people keep putting up their ideas

Disadvantages:

* some negative feedback
* some obscene or rude feedback
* flaming can occur if someone disagrees with comments by another person

## CONCEPT OF HYPERTEXT MARK-UP LANGUAGE (.HTM/.HTML)

Hypertext Mark-up Language (HTML) is the coded language that is used to author websites

HTML consists of tags

Tags are surrounded by brackets that consist of greater than and less than signs (<>) these tags are used to describe the layout of a website and the arrangement of the various elements within the website

HTML files are text files consisting of the various tags, arranged in a strict pattern  
The browser can interpret the codes within the HTML file and use the information gained to gather the resources required and construct a copy of the webpage on your screen in real time

## PURPOSE OF WORLD WIDE WEB CONSORTIUM (W3C)

The W3C is an international coalition that is responsible for implementing the standards that companies abide by when building devices and resources to be used on the Internet

In the early days, many people came up with many ideas for how the internet should work. The success of the internet is due mostly, in part, to the World Wide Web Consortium

PURPOSE OF W3C:

* to set web standards
* web standards anywhere, anytime
* web standards for desktop, mobile devices, interactive TVs, yes even cars

The standards set by the W3C are voluntarily adopted by developers in order to ensure that resources and devices communicate with each other in a consistent way.

## PURPOSE OF W3C CONVENTIONS

FEATURES OF W3C

* standards for HTML
* standards for CSS
* standards for images, audio, video
* standards for web apps and web scripting
* provides privacy and security guidelines

PURPOSE OF W3C CONVENTIONS

* to promote clear understandings of the above features
* One example if the standards are followed
  + It will allow accessibility – web for all
    - due to providing web content accessibility guidelines for developers, there will be…
      * text alternatives for images
      * captions for audio and video
      * use sufficient contrast for readability
      * help users avoid mistakes

## PURPOSE OF THE WEB DESIGN AND APPLICATIONS STANDARD FROM THE W3C STANDARDS

Web Design and Applications involve the standards for building and rendering web pages, including:

* HTML
* CSS
* SVG
* device APIs
* and other technologies for Web Applications (“WebApps”)

This section also includes information on how to make pages accessible to people with disabilities (WCAG), to internationalize them, and make them work on mobile devices.

The Web Design and Application Standards ensure consistency and comparability in the design of Websites and Web Apps so that users can have a consistent and enhanced experience.

HMTL and CSS

HTML and CSS are the fundamental technologies for building web pages

HTML (html and xhtml) for structure, CSS for style and layout, including WebFonts, find resources for good Web page design as well as helpful tools.

GRAPHICS

In HTML, graphics are added using the <img> tag. This tag identifies the location of the source image file using a URL and specifies any post-processing which is required (for example resizing)

AUDIO AND VIDEO

The web is about more than text and information, it is also a medium for expressing artistic creativity, data visualization, and optimizing the presentation of information for different audiences with different needs and expectations

Like graphics, the use of video and audio on web sites enhances the experience for users, and W3C has several different and complementary technologies that work together with HTML, SVG and scripting to provide the creators of web pages and web applications with the tools they need to deliver the best possible representation of their content

ACCESSIBILITY

(accessibility notes are above)

INTERNATIONALIZATION

Access to the Web for all has been a fundamental concern and goal of the World Wide Web Consortium since the beginning

Unfortunately, it is easy to overlook the needs of people from cultures different to your own, or who use different languages or writing systems

* If you do, you will build specifications and content that present barriers to the use of your technology or content for many people around the world

MOBILE WEB

W3C promotes “One Web” that is available on any device. W3C’s Mobile Web Best Practices help authors understand how to create content that provides a reasonable experience on a wide variety of devices, contexts, and locations.

## VALIDATION TECHNIQUES FOR ONLINE FORMS

Data validation is the process of ensuring that user input is clean, correct, and useful

Typical validation tasks are:

* has the user filled in all required fields?
* has the user entered a valid date?
* has the user entered text in a numeric field?

Most often, the purpose of data validation is to ensure correct user input

Validation can be defined by many different methods and deployed in many different ways.

Some ways of performing validation include:

* Input Masks (e.g., when looking for a date, look for data in the form XX/XX/XXXX)
* Data Types (e.g., restricting an age field to use only numerical data)
* Validation lists (e.g., comparing an entry for postcode to a list of acceptable postcodes)

## ANALYSE SOURCES OF INFORMATION FOR VERIFIABILITY, ACCURACY AND CURRENCY

VERIFIABILITY

Researched information must be verifiable to ensure it is accurate, current, reasonable etc.

* Verifiable information is consistent with other sources

ACCURACY

The accuracy of information gathered is vital. Information must be accurate when researching to ensure that errors aren’t made.

Accuracy can be verified by:

* Cross Checking
* Ensuring sources are valid and knowledgeable in the field
* being aware of bias

CURRENCY

Data is current if it is time critical and the time hasn’t expired to indicate a change

# TERM 2 WEEKS 10-11 (MANAGING DATA)

## SECURITY TECHNIQUES FOR THE MANAGEMENT OF DATA

DISASTER RECOVERY PLAN

* a coordinated and detailed plan for how to protect and recover from catastrophic failures affecting ICT resources
* DRPs will often identify preventative measures which must be undertaken regularly along with reactionary measures which must be implemented if a disaster occurs
* They will include such measures as backup, restore, security, preventing malicious activity, recovering from Malicious Activity etc.

AUDIT TRAIL

* a document that verifies that all preventative actions have occurred to manage disaster recovery
* It usually includes sections where technicians sign and date that actions have been completed, such as backup, virus signature update etc.

## TYPES OF BACKUP TECHNIQUES AND ARCHIVING OF DATA

FULL

* backs up everything that is stored in selected directories at one time
* A full backup is usually used the first time a system is backed up to ensure that everything is secured.

DIFFERENTIAL

* backs up only the files that have been changed since the last full backup
* saves significant disk space whilst ensuring that unchanged files are still available in previous backups
* most common type of backup for regular, automated backup.

INCREMENTAL

* backs up a portion of the selected files at a time
* usually run on a recurring schedule for data that doesn’t change frequently

An incremental backup will back up only the files that have been changed since the last backup of any type (Full, Differential or Incremental)

* backups that exclude files from the back up usually do so to save disk space
* Businesses must determine which backup strategy is most suitable for the protection of their data
* Usually, businesses will choose a cycle for each backup type, i.e. Monthly Full Backups, with Differential Backup every Monday and Incremental Backup daily.

DAILY

A daily backup is, funnily enough, a backup that occurs every day. Usually automated, the style of backup can vary depending upon the needs of the company.

## ONLINE DATA STORAGE METHODS

DATA WAREHOUSES

* A large collection of data from a wide range of sources within a company that is used to drive company decisions
* For example, a customer database that includes data from:
  + Sales
  + Accounts: Customer Relations
  + Complaints etc.
* it contains everything the company knows about each customer and this can be queried to identify ways in which customer service can be improved

DATA MARTS

* a subset of the data warehouse that contains data specific to a certain department within the company
* Most companies that follow a Data Mart model combine Data Marts to create a Data Warehouse
* Data Marts are queried to make business decision for the department, rather than the whole company

DATA IN THE CLOUD

* Just like cloud storage, cloud apps and cloud control, there are services that can host your database in the cloud as well
* These services have the same advantages and disadvantages as other cloud services
* Advantages
  + Access from anywhere
  + cost savings
  + multi-user capability
* disadvantages
  + Data security
  + need for fast Internet

## PURPOSE OF DATA MINING

Data Mining is often used to extract useful information from large, multivariate data sets

Data Mining is used to determine patterns within the set of data and is usually used to learn new things about the subjects of the data

An example of data mining would be to compare tax records with census records within a country to determine whether there are any patterns or trends between an individual’s address and their taxation status

Generally, the term Data Mining is used when the patterns are unknown, if the data is being processed to test or prove a hypothesis, the term Data Analysis is used

## PROCESSING OF DATA CONSIDERING SECURITY OF DATA THROUGH THE USE OF

PASSWORDS

* an important aspect of computer security
* Without strong passwords, it is easy for unauthorised users to gain access to data and systems that they are not permitted to use
* Most organisations enforce a password policy which requires that passwords are not short, they contain special characters such as capital letters, numbers or symbols, they are not repeated etc.
  + All of these habits make good password security.

FIREWALLS

* A firewall is a system (usually software) that limits access from the outside network to a computer or a subnetwork
* Firewalls usually work either by blocking ports (see networking/TCP/IP) or packet inspection
* In either method, the firewall will only pass data through if it meets specified rules set up by system administrators
* Admins can refuse entry to data coming from specific locations, containing specific information types, checking time of day or looking for malformed data sets, which often indicate malicious access

BIOMETRICS

* the science of using human features to replace passwords
* Fingerprint scanning, retinal scan and voice matching are three common types of biometrics
* Since these features are unique to individuals, they make a device harder to operate maliciously, however they also reduce the ability to share use of that system

ANTI-VIRUS SOFTWARE

* designed to process all files on a system and compare them to a known database of “virus signatures” which can be detected in infected files
* These byte patterns are identified by the anti-virus software’s developer and usually delivered to individuals in an update package that the system downloads on a regular basis
* Failing to download new virus signatures regularly means that your computer might become vulnerable to newly created viruses

DIGITAL SIGNATURES

* an encrypted file that is intended to be used by one person, department or entity
* Digital signatures contain an encoded data string that is verified (sometimes provided) by a certifying agency
* Digital signatures are designed to be only generated by the certified owner and are therefore seen as a way of proving identity

DIGITAL CERTIFICATES

* Like Digital Signatures, Digital Certificates are used to identify genuineness
* They are, similarly, encoded data strings that are verified by a certifying agency
* Certificates are most commonly used to verify that a document or application is genuine
* They are commonly used when developing apps for mobile devices, to prove that the app has been verified for delivery using the Appstore

ENCRYPTION

Encryption is the process of securing data using cryptography

When data is encrypted, the content of the data is transformed using a reversible method, to ensure that the data cannot be recovered by any party that is not intended to use that data.

A simplistic example of encryption is the Caesar cipher

In the Caesar cipher, the letters of the alphabet are shifted a known number of places. the number of places shifted is the KEY only users who know the key can decipher the message

Example, if the key is 5, then the following applies:

A picture containing text, clipart

Description automatically generated

and this means that the word fred will translate to kwjh

Knowing that the key is 5, kwjh can be translated back to the word fred.

Caesar Cipher is a very weak form of encryption, which can be defeated in only 25 steps (input key 1 and check, input key 2 and check …..) Real-world encryption schemes work on a binary level and are much more complex

## CONCEPT OF WEB 2.0 AND WEB 3.0

to understand Web 2.0 and Web 3.0, you need to understand the original concept of the World Wide Web

* At creation, the World Wide Web was a network that allowed specialised Web Developers to create media rich pages by writing HTML
* The luxury of publishing content on the Web was reserved to those who had the skill to create web pages
* The Web was static and contained little user generated content (content that wasn’t produced by the developer of the website)

WEB 2.0

* Web 2.0 describes the change in the Internet to ways of using it that are more familiar to us today
* Users (the general public) have become far more responsible for the actual content we see on the Web and Developers have become the curators and publishers of that content
  + For example, YouTube is a website, created by developers who have written all the code that is used for YouTube to be viewed by its audience, however YouTube developers have made a tiny proportion of the videos that are available for viewing on the site
  + Most of the content comes from the users, who upload their videos to the site
* User Generated Content such as this, drives the majority of the content that is seen on the Internet these days. Even WordPress is a Web 2.0 technology!

WEB 3.0

* Web 3.0 is the future of the Internet
* Web 3.0 refers to the use of massively connected data on the Internet to solve bigger, more complex and more abstract problems
* Web 3.0 is rooted in the search for Artificial Intelligence and Fuzzy Logic
* Web 3.0 technologies typically draw information from disparate sources to undertake complex, abstract tasks in real time
* An example of a Web 3.0 technology is the Google Maps navigation system
  + Any user who uses Google Maps to navigate, provides data back to Google about their journey without even knowing it
  + Google processes this data in real time to improve the efficiency of navigation data for all users. for example. if 25% of vehicles are navigating with Google Maps, Google will identify the reduction in speed that occurs when traffic congestion occurs
  + This information will be correlated with information Google has gained from open web apps such as Main Roads, WAPOL and any car manufacturers to re plan a user’s journey in real time and recommend an alternate route
  + The system is also capable of displaying an estimate of how long the delay will be and your expected arrival time all through the processing of masses of data coming from a multitude of sources

## PURPOSE AND FEATURES OF CONTENT MANAGEMENT SYSTEMS (CMS)

A Content Management System is an online system that is used to create, process and publish content for a user who is not necessarily skilful enough to do this task independently

CMS are a product of Web 2.0 technology and are typically used to create websites that are used as blogs, bulletin boards, media display/sharing etc.

Examples of CMS

* WordPress
* PHPBB
* Joomla
* Shopify

# TERM 3 WEEKS 1-4 (NETWORKS)

## TYPES AND CHARACTERISTICS OF COMMUNICATION PROTOCOLS

Communication protocol: A network protocol is an established set of rules that determine how data is transmitted between different devices in the same network

* Essentially, it allows connected devices to communicate with each other, regardless of any differences in their internal processes, structure or design. Network protocols are the reason you can easily communicate with people all over the world, and thus play a critical role in modern digital communications.

TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL (TCP/IP)

TCP/IP is a suite of communication protocols that controls transmission of data across networks such as the Internet.

TCP/IP is a standard that consists of many protocols including protocols for websites (HTTP and HTTPS) Internet Addressing (IP) email (SMTP, POP and IMAP) amongst many others.

HYPERTEXT TRANSFER PROTOCOL (HTTP)

HyperText Transfer Protocol is the protocol used to transmit website data across the Internet. It is important that we don’t confuse HTTP with HTML. HTML is the programming language which is used to describe the layout of a website, HTTP is the TRANSPORT protocol used to shift the data from a server to a client.

HYPERTEXT TRANSFER PROTOCOL OVER SECURE SOCKET LAYER (HTTPS)

HTTPS is an extension of the HTTP protocol which adds a layer of encryption to ensure that data is not recoverable if intercepted in transit.

WIRELESS APPLICATION PROTOCOL (WAP)

Wireless Application Protocol (WAP) is a technical standard for accessing information over a mobile wireless network. A WAP browser is a web browser for mobile devices such as mobile phones that use the protocol. Introduced in 1999,[1] WAP achieved some popularity in the early 2000s, but by the 2010s it had been largely superseded by more modern standards.

Pretty much all modern smartphone handsets can interact directly with TCP/IP and 3G/4G/5G connections are capable of handling TCP/IP natively now.

WAP is outdated.

## TYPES AND CHARACTERISTICS OF COMMUNICATION STANDARDS

802.11X (WIRELESS)

802.11 is the standard used to describe Wireless networked communication. Often called Wi-Fi, the 802.11 standard has seen many updates, the X is a generic term used to discuss the protocol in all of its various versions, however more detail can be found on the individual updates

* 802.11A
* 802.11B
* 802.11G
* 802.11N
* 802.11AC
* 802.11AX

LINKS FOR EACH OF THESE ON THE WEBSITE

Each version has different features and limitations with the general rule of thumb being; the higher the bandwidth, the lower the reliability or range.

802.3 (ETHERNET)

802.3 is the standard used to describe Ethernet.

the 802.3 standard used to describe Ethernet. Although many people consider 802.3 to be a standard relating to copper cable used as transmission media, 802.3 contains specifications for Optic Fibre, Coaxial Cable and many other physical media.

802.3 relates to the PHYSICAL MEDIA used to transmit messages in a wired computer network.

## TYPES OF NETWORK SECURITY MEASURES

FIREWALLS

A firewall is a system (usually software) that limits access from the outside network to a computer or a subnetwork. Firewalls usually work either by blocking ports (see networking/TCP/IP) or packet inspection. In either method, the firewall will only pass data through if it meets specified rules set up by system administrators. Admins can refuse entry to data coming from specific locations, containing specific information types, checking time of day or looking for malformed data sets, which often indicate malicious access.

PASSWORDS

Passwords are an important aspect of computer security. Without strong passwords, it is easy for unauthorised users to gain access to data and systems that they are not permitted to use. Most organisations enforce a password policy which requires that passwords are not short, they contain special characters such as capital letters, numbers or symbols, they are not repeated etc. All of these habits make good password security.

PHYSICAL SECURITY

Physical security refers to restricting access to the actual hardware systems used in a computer network.

Typically, this means locking resources up so that malicious users cannot directly access them.

Techniques about to enable malicious users to access systems if they have physical access to the hardware. It isn’t difficult to find a system that uses a lightweight operating system stored on a USB that enables a user to gain access to the hardware of the system simply by rebooting the device. Once hardware access is gained, the malicious user can search file locations to gather valuable information on the system or create a false login which can allow superuser access once the system is rebooted into its native OS

# TERM 3 WEEKS 5-6 (IMPACTS OF TECHNOLOGY)

## DATA AND INFORMATION SECURITY RELATED TO PERSONAL OR SENSITIVE INFORMATION

## PURPOSE OF A CODE OF CONDUCT

A code of conduct is a written document commonly used in businesses to define acceptable standards of behaviour for employees

Codes of conduct are commonly applied to ICT Device usage but can be used in any area of the employment contract

Typical inclusions to code of conduct are:

## ELEMENTS OF A CODE OF CONDUCT

WORK HOURS

An employee’s work hours might be identified in an employment contract OR in a code of conduct

* Typically, a code of conduct will add further details when employee hours are flexible, especially when the employee has some control over which hours they work (i.e. flexi-work where an employee must work a certain number of hours per week but is free to choose the days and start/stop times the Code of Conduct might say that the employee must work on Tuesdays)

EMPLOYEE EMAIL USE

Email use is very commonly defined in a code of conduct

* It is common for companies to desire their employees use emails professionally and appropriately
* therefore, there will usually be restrictions on the use of company email services for:
  + Personal use
  + Non-business related purposes such as sharing jokes
  + Offensive content

EMPLOYEE INTERNET USE

like employee email use, employee internet use is a very common addition to a company Code of Conduct

Employers are very interested in ensuring that the money they spend on providing Internet access to their employees is not wasted

* Typically, a Code of Conduct will restrict such activities as:
  + Online Shopping
  + Social Media
  + Offensive Actions
  + Accessing objectionable content
  + Taking actions that might bring the company into disrepute

There are many cases where employees have been sanctioned for using the Internet wrongly, here are some examples

EMPLOYEE PRIVACY

Often a code of conduct will be used to define, or modify, an employee’s right to certain kinds of privacy

* for example, using a code of conduct an employer can mandate the right to publish the employee’s name on the company website

There are certain grey areas with this concept though, for example, an employer is not permitted to require you to divulge certain information in the conduct of your job

* The Equal Opportunities act protects your right to keep race, religion, marital status, sexual orientation and a whole bunch of other stuff private, so there is an argument that a code of conduct cannot modify these rights to privacy.

A code of conduct might also define an employee’s responsibility to protect the privacy of their fellow employees

EMPLOYER’S MONITORING OF WORK EMAILS, INTERNET ACCESS AND COMPUTER USE

In addition to limiting the actions employees take when using the Internet and email, a Code of Conduct also often clarifies an employee’s right to monitor Internet and email usage

since the employer “owns” the bandwidth that is being used, they have the right to ensure that the employee is using it appropriately

* Employers usually log access and track the use employees make of these services.

## ONLINE CENSORSHIP OF INFORMATION IN A GLOBAL CONTEXT

When we consider a global network such as the Internet, access to offensive content can become a real problem

* Since it is possible for offensive or illegal content to be stored on servers anywhere in the World, the purveyors of such content simply need to find a jurisdiction where the content they are providing isn’t illegal and they can keep their sites running for years!

Take the example of pirated software, although this practice is illegal in many jurisdictions, sites such at thePitrateBay and ExoTorrent still exist because they have been able to distribute their servers on a global scale, making use of countries who have more relaxed content protection laws to host the sites

China is well known for it’s extensive Internet censorship activities, all Internet Service Provision in China is provided by state-run organisations and therefore Chinese ISPs are the only ones able to effectively limit user access to certain sites (China has it’s own version of popular social media platforms such as Facebook, YouTube and twitter)

## ISSUES WITH THE USE OF CLOUD COMPUTING

Cloud Computing refers to using online resources to complete tasks typically completed by a standalone computer. Examples include:

* Cloud Storage
* Cloud Apps
* Remote Control

Cloud computing outsources the provision of hardware and software often enabling users to undertake tasks that would be too complex and/or expensive otherwise

CONFIDENTIALITY OF DATA

Since Cloud services store your data on hardware that is not your own, there is a possibility that the service provider could have access to your data without your knowledge/permission

* For this reason, users with highly sensitive of confidential data will typically avoid using cloud services

SENSITIVITY OF DOCUMENTS

(See confidentiality of data)

LEVEL OF ACCESSIBILITY

Cloud Computing, by definition migrates all your usage of ICT resources to the Internet. This means that, to have an efficient and secure Cloud Service, you will require a reliable and fast Internet Connection

* Losing Internet connection will likely mean that you don’t have access to the data you have stored in the Cloud

AVAILABILITY OF ONLINE APPLICATIONS

with the exception of issues related to level of accessibility, Cloud Computing is considered to be highly available

* One of the big selling points of Cloud Service Providers is that your data is available 24/7/365 from anywhere in the world on any computer
* since most Cloud services can be accessed from an Internet Browser, you don’t even need to install a proprietary app to access your data

## IMPACT OF DIGITAL TECHNOLOGIES AND GLOBAL MARKETS ON:

PRODUCTIVITY

Digital Technology has made a profound impact on productivity. With the extensive uptake of digital technologies in the business world, most employees are becoming capable of producing many times the amount of work than they could produce using traditional methods

With the advent of globalisation, strategies such as outsourcing have enabled companies to access labour resources far more cheaply in certain fields, thus ensuring that local employees must become more efficient or be replaced by somebody working overseas.

ACCESS TO KNOWLEDGE OR RESOURCES

Through the networks provided by online services, cloud resourcing and outsourcing, companies now have easy and cheap access to knowledge, skills and resources that would have been unheard of ten years ago

Companies in China are very active selling physical resources online at vastly reduced rates than their competitors, thus making hardware purchasing easier and cheaper

* technical staff abound in other countries where salary and conditions are far more favourable than in the west and therefore companies can use these factors to gain access to resources, both human and material, that they wouldn’t have access to in any other way

OUTSOURCING

Outsourcing is the practice of using employees from outside your company to complete a task for an agreed fee

* this is most commonly used to access experience that isn’t present in the current workforce or to gain access to labour more cheaply

Typical Outsourcing Scenarios:

* Overseas Call centre
* Using software developers in India to code a specific project
* Hollywood movies being filmed on the Gold Coast

As you can see, outsourcing isn’t always bad, and Australia isn’t always the source of the work, sometimes we are the recipient.

Impacts of outsourcing on the Issuing company:

* Often reduces costs
* Can gain access to unique skills
* can be short term
* Can introduce confusion about task parameters
* Potential information security issues

Impacts of outsourcing on the receiving company:

* Provide more work for employees
* Money coming into the company
* Opportunity to specialise in a unique field
* Can make more extensive use of unique resources.

## IMPACT OF WEB 2.0/WEB 3.0 ON THE USE OF DIGITAL TECHNOLOGIES

to understand Web 2.0 and Web 3.0, you need to understand the original concept of the World Wide Web.

At creation, the World Wide Web was a network that allowed specialised Web Developers to create media rich pages by writing HTML

* the luxury of publishing content on the Web was reserved to those who had the skill to create web pages
* The Web was static and contained little user generated content (content that wasn’t produced by the developer of the website)

WEB 2.0

i.e., user generated content makes up most of the web

Web 2.0 describes the change on the Internet to ways of using it that are more familiar to us today

* Users (the general public) have become far more responsible for the actual content we see on the Web and Developers have become the curators and publishers of that content
* For example, YouTube is a website, created by developers who have written all the code that is used for YouTube to be viewed by its audience, however, YouTube developers have made a tiny proportion of the videos that are available for viewing on the site. Most of the content comes from the users, who upload their videos to the site. User Generated Content such as this, drives the majority of the content that is seen on the Internet these days. Even WordPress is a Web 2.0 technology!

WEB 3.0

i.e., fuzzy logic and AI can be solved over the web through the use of multiple sources

Web 3.0 is the future of the Internet

* Web 3.0 refers to the use of massively connected data on the Internet to solve bigger, more complex and more abstract problems
* Web 3.0 is rooted in the search for Artificial Intelligence and Fuzzy Logic
* Web 3.0 technologies typically draw information from disparate sources to undertake complex, abstract tasks in real time
* An example of a Web 3.0 technology is the Google Maps navigation system. Any user who uses Google Maps to navigate, provides data back to Google about their journey without even knowing it. Google processes this data in real time to improve the efficiency of navigation data for all users. for example. if 25% of vehicles are navigating with Google Maps, Google will identify the reduction in speed that occurs when traffic congestion occurs. This information will be correlated with information Google has gained from open web apps such as Main Roads, WAPOL and any car manufacturers to re plan a user’s journey in real time and recommend an alternate route. The system is also capable of displaying an estimate of how long the delay will be and your expected arrival time all through the processing of masses of data coming from a multitude of sources.

# TERM 3 WEEKS 7-8 (APPLICATION SKILLS and PROJECT MANAGEMENT)

## CONCEPT OF SERVICE LEVEL AGREEMENTS

A Service Level Agreement (SLA) is a contract between a Service Provider and a Client. Service Providers are commonly ICT Maintenance/Support companies or ISPs however SLAs can apply to any Service Provision agreement.

An SLA will usually detail the limits of the service, any inclusions or exclusions (things that are not covered under the agreement. and targets to be met.

Often those targets are expressed as a percentage, for example in a cloud storage provision SLA, there might be an entry for uptime (the amount of time a computer is available and doing its job) Cloud uptime might be listed as 95%. If the server isn’t available for 95% of the time, then there will be a clause in the SLA identifying a penalty (usually financial).

SLAs protect service providers by ensuring that they don’t have to provide services that are unexpected or unreasonable.

SLAs protect clients by ensuring that they don’t pay more than they need for services that don’t apply to their situation.

## FEATURES OF SERVICE LEVEL AGREEMENTS

AVAILABILITY OF SERVICES

Service availability usually refers to the amount of time that a service can be accessed. Refer to the Service Level Agreements page for an example.

TYPES OF SERVICES

SLAs often refer to the types of service that will be provided. Since service is often a varied field, clients can often be caught paying for things they don’t need if they take a generic contract.

Services might include; direct telephone support, online helpdesk, physical maintenance of devices etc.

An SLA can identify the various bits and pieces of the support package that are required by the client, thus saving money for the client and ensuring that the provider doesn’t prepare to support in ways that aren’t needed.

## ADVANTAGES OF LOCAL AND GLOBAL OUTSOURCING COMPARED WITH IN-HOUSE PRODUCTION

## PURPOSE OF OUTSOURCING DATA MANAGEMENT

## EVALUATION OF SOFTWARE, INCLUDING USABILITY