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| 1. Recognise and describe how the elements and principles of visual communication inform user interface development. |

You should have your head around **Useability Principles** from your IAs. However, the question “*Explain how three* ***elements*** *and three* ***principles*** *of* ***visual communication*** *(excluding colour) have been used*” appeared… it was worth 12 marks (sigh). Students then had to sketch a GUI and “*Use four* ***elements*** *and* ***principles*** *of* ***visual communication*** *to justify, in annotations on your diagram, the placement and visual appearance of the five new features of the user interface*”… another 4 marks.

Visual communication wasn’t marked on the ISMGs for the IAs explicitly so it may not have been covered as in-depth as other components. Visual communication appears in the syllabus in ***Unit 2***:

explore and use the **elements** and **principles** of **visual communication**:

* **elements** are limited to space, line, colour, shape, texture, tone, form, proportion and scale
* **principles** are limited to balance, contrast, proximity, harmony, alignment, repetition and hierarchy

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| Element | Description | Example |
| Space | Used to support meaning or zone groups of data (i.e. space between elements). Used consistently to develop predictability |  |
| Point | Smallest element of visual communication, can be a dot but not necessarily circular | graphic representation of point design element |
| Colour | Choice of colour matters. Be ***consistent*** throughout application, and make sure colours chosen are ***compatible*** with each other (perhaps use a colour wheel as shown in the example) | Color wheel - color theory and calculator | Canva Colors |
| Tone | Tone is light or dark variation of any colour | graphic representation of tone design element |
| Line | A line can be a starting place, a marker or trigger to change. | graphic representation of line design element |
| Shape | Shapes can use lines (straight or curved) to develop two-dimensional zoning and the implied boundary of an object. Shapes are good for conveying structure around data. The simplest form of shapes with data is a table. Shapes could also be a circular icon to centre a user to a record button on a phone. | graphic representation of shape design element |
| Texture | Texture refers to the tactile or inferred visual features of an object | graphic representation of texture design element |
| Form | Can give depth | graphic representation of 3-D form design element |
| Proportion and scale | Ratio and size. Look for the “Golden Ratio”. In mathematics, two quantities are in the golden ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities. | Golden ratio - Wikipedia |

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| Principle | Description | Example |
| Balance | Arrangement of components of a visual communication in relation to a real or implied central axis / equilibrium / symmetry. | graphic representation of balance design principle |
| Contrast | Contrast refers to opposing aesthetic qualities (i.e. what you see when you compare things that are different) and can be used for to create emphasis or focal point | graphic representation of contrast design principle |
| Proximity | Where elements are positioned or grouped in relation to each other, perhaps ‘clumping’ elements near each other that have a perceived relationship (or avoiding those that don’t) | Principles of design caroline burdett. repetition balance proximity  simplicity contrast. - ppt download |
| Harmony | Interpreting the proximity to make sure components as a whole provide valuable meaning and are complementary across the interface. For example, sometimes it is better to split datasets across screens for example to avoid confusion. | UNITY (HARMONY)<br />Unity or harmony |
| Alignment | Elements should ‘line up’, commonly used in HTML sign up forms | HikaShop - Alignment errors in frontend display - HikaShop |
| Repetition | Repeated elements (such as page constructs, sections or product layouts) which helps predictability | Developing Visual Rhythm in Web Design |
| Hierarchy | Hierarchy refers to the ‘reading order’ of a design | graphic representation of hierarchy design principle |

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| 1. Evaluation criteria. (**prescribed** and **self-determined**) |

**Pro tip**: a question will often require you to evaluate a system to the *negative*.. so try and find a fault somewhere in any system on the exam. Also, if the device is an IoT device (i.e. not purely digital), stick to the digital aspects for evaluation *unless otherwise instructed to do so*. So don’t go for “~~the device could explode or stolen~~” – keep it **Digital**.

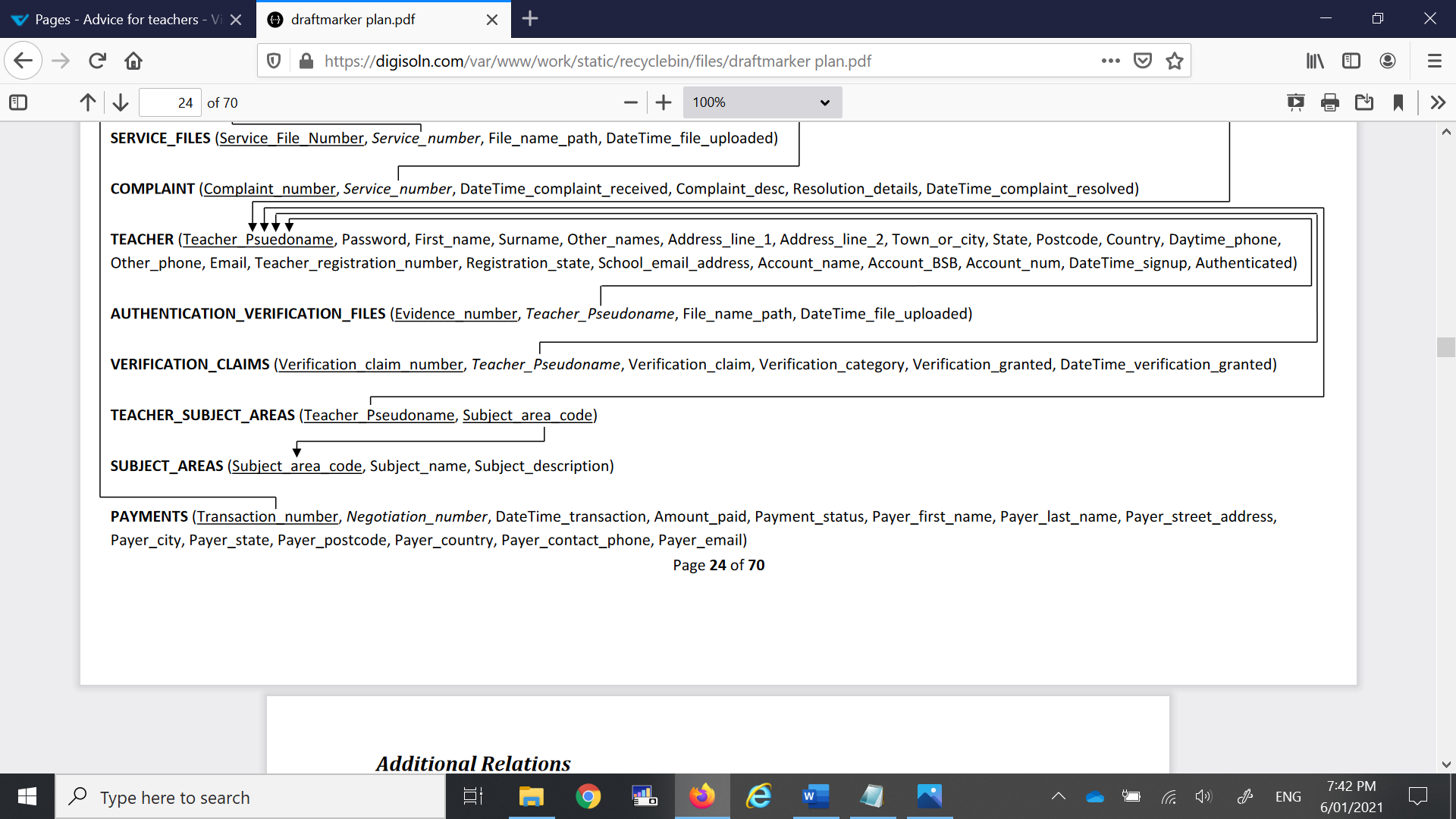
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| Criteria | What to look for when evaluating in the *negative*... |
| Reliability | Look for reasons why a system will not satisfactorily **perform the task** for which it was designed or intended |
| Accuracy | Look for logical threats to **keeping accurate data** records |
| Maintainability | Look for problems with the **ease and speed** at which a system can **maintain operational status**, especially after fault or repair.  In other words, can the system easily do what it’s supposed to do without ‘*needless’* human intervention. |
| Security | Look for security issues with data storage, broadcasting (i.e. encryption strength) or user authentication. Or maybe another security issue entirely.. you get the idea. This one is about unwanted, unauthorised or unauthenticated access to data. |
| Sustainability | Look for ways in which the system doesn’t support the needs of the present without compromising the ability of future generations to support their needs… |
| Efficiency | Efficiency seeks maximum productivity with the least / minimal consumption of system resources.  Efficiency takes into account a lot of factors and criteria, such as reliability, speed and programming methodology (which can lend its hand to scalability).  So look for inefficiencies in the code, interchange format or DB design… |
| *… there are heaps more criteria you could choose …* | |

Note: *Useability* (in itself) in Digital is a *set of principles* – steer away from it (perhaps) if asked explicitly for a **Prescribed** or **Self-Determined** criteria. Accessibility would make a better criteria in this case (perhaps). Make sure you know the difference between Utility (i.e. functionality) and Effectiveness (i.e. reliability)..

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| 1. What a table relation looks like. (its just a short way of writing out a table definition). |

TableName [Field\_1, Field\_2, Field\_3]

Sometimes keys are underlined, and FK relationships shown. This is also known as relational schema.



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| 1. Recognise and describe features of symmetric (Data Encryption Standard — DES, Triple DES, AES — Advanced Encryption Standard, Blowfish and Twofish) and assymetric (RSA) encryption algorithms |

If this makes no sense at all, just try and **memorise the highlighted bits** for each encryption:

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| Encryption | Characteristics | Attributes |
| DES | * 64 bit blocks, but short key length of 56 bits makes it too insecure for applications * Data Encryption Standard (DES) is really old and no longer used | * Symmetric * Block cipher * **Feistel** |
| Triple DES | * More secure than DES * Encrypts data 3 times using a different key for at least 1 of the iterations * Used for securing financial transactions * Slower than other methods due to the encryption process being repeated 3 times | * Symmetric * Block cipher * **Feistel** |
| AES | * Advanced Encryption Standard * Replaced DES in 2000 * Most popular and secure encryption algorithm * Key sizes 128, 192 or 256 bits | * Symmetric * Block cipher * ***Substitution – Permutation*** |
| Blowfish | * Splits a message into blocks of 64 bits and encrypts each block individually * Fast but **not really recommended anymore** because of the small block size of 64 bits (use Twofish instead) * Still used in e-commerce payment gateways and password management systems (surprisingly) | * Symmetric * Block cipher * Open source * **Feistel** |
| Twofish | * Same as Blowfish but 128 bit blocks (which puts it on par with AES) * More secure than Blowfish | * Symmetric * Block cipher * Open source * **Feistel** |
| RSA | * Public key to encrypt, private key to decrypt * Commonly used in TLS (successor to SSL) which gives you HTTPS (most of the time) * Whatever is *encrypted* by the public key can only be *decrypted* by the related private key. | * *Asymmetric* * Both keys are mathematically related to one another but not the same. |
| PGP | * Pretty good privacy * Encrypts emails, texts, files * Uses a ‘one-off session’ symmetric key to encrypt * This symmetric key is delivered to a recipient via public-key encryption process (such as RSA) | * *Hybrid symmetric and public-key* * Complies to OpenPGP standard |

Notes:

* A Feistel network is a cryptographic technique used in the construction of block cipher-based algorithms and mechanisms. A Feistel network is also known as a Feistel cipher.
* A Feistel structure encryption consists of multiple rounds of processing of the plaintext, each round consisting of a “substitution” step (**swapping**) followed by a permutation step (**shifting**).
* All encryption algorithms have a secret (private) key.

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| 1. **No lost marks for wrong answers** so ~~never cross anything out~~. Crossed out answers cannot legally be marked correct, even if partially correct, and you don’t *lose* marks for wrong answers. |

Crossing out work wastes time and can cost you marks. Try to leave what you have written if possible, keep writing and correct yourself. If you are unsure between responding with 2 answers, write both. Markers look to **reward** you, so its highly likely you’ll come away with a win.

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| 1. Go through the exam topics with a fine-tooth comb… as there will always be something unpredictable. |

It is mandatory that 👉 **you** 👈 click on the topic list links below and check that *you* know **everything** on those lists.

If you don’t understand something, make a note of it, and **ask**, at least 48 hours before the exam:

* Topic 1: [**Digital methods for exchanging data**](https://digisoln.com/exam/exam_topic1)
* Topic 2:[**Complex digital data exchange problems and solution requirements**](https://digisoln.com/exam/exam_topic2)
* Topic 3:[**Prototype digital data exchanges**](https://digisoln.com/exam/exam_topic3)