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| **Stimulus: *Cybersecurity*** |
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Digital Technologies project: digital solution

**Section 1: Explore and Develop**

1. **Analyse** and **determine** the **security strategies** and **utility** required for users of a simple text messaging application prototype (for inspiration, check out early forms of [text messaging](https://en.wikipedia.org/wiki/Text_messaging), [IRC](https://en.wikipedia.org/wiki/Internet_Relay_Chat) or [BBS](https://en.wikipedia.org/wiki/Bulletin_board_system)).

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| * Complete **Section 1: Explore and Develop** as though your system will use a web interface The actual prototype (section 2) can be coded using either web or console interface. * For this section, utilise any **security strategies** or plan any **utility** features in your system that you think would be useful, regardless of your coding ability. |

**Utility** functionality or features may resemble those used in common, simple chat or text messaging systems. Examples of **security strategies** may include:

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| **Strategy** | **Examples** |
| **Rules** | * enforce username or password complexity requirements, such as:   + minimum and maximum length   + symbol, capital letter or number combinations   + checking that passwords aren’t based on common words or sequential combinations (e.g. “*abcd1234*” or “*password*”) |
| **Processes** | * checking for duplicate usernames, and password confirmation * scrambling stored passwords (i.e. jumbling text around so it can’t be easily read or misused if intercepted across the internet) * multi-factor authentication (such as asking a secret question) * spam or bot protection (similar to a [CAPTCHA](https://en.wikipedia.org/wiki/CAPTCHA)) * idle logout timer |
| **Utilities** | * username suggestion tool, password randomizer or reset feature * username or password autofill (similar to [Keychain Access](https://support.apple.com/en-au/guide/keychain-access/welcome/mac)) * backdoor access, allowing administrators to:   + view detailed system access logs   + set up intrusion detection and response systems   + account management, such as reset password / ban accounts etc.   + read or moderate user generated content or messages |

To complete this section, you should:

* Brainstorm **security strategies** you wish to implement and discuss, explain, or illustrate how you intend these strategies will work.
* Draw, diagram or plan a web application *graphical user interface* for your prototype.
* Communicate planned **utility** features or functionality using annotations
* Complete **Section 1** within a maximum of one A3 landscape page (min 10pt font)

**Section 2: Generate and Evaluate**

1. **Generate** a console or web-based *prototype* that implements or simulates **security strategies** and **utility** determined in Section 1.
2. **Evaluate** the risk(s) to data security, sustainability, innovation, and enterprise of your prototype messaging system. Try and use examples (data) from your program where possible to help illustrate your arguments.

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| You can complete **Section 2: Evaluate** using **#comments** at the bottom of your *main* source code file for **Section 2: Generate**. |

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| **Glossary** |
| * **Security**: prevent unwanted, unauthorised, or unauthenticated access |
| * **Utility**: provide necessary functionality or features |
| * **Sustainability**: supports needs of current and future generations |
| * **Innovation**: newness of a method, product or idea that improves a situation or context |
| * **Enterprise**:potential for entrepreneurial or economic activity or profit |
| **Submission Requirements** |
| * Section 1: submit one digital document (maximum of one A3 landscape page) |
| * Section 2: submit all commented source code files (includes evaluation in comments) |
| **Important Notes** |
| * Simulate any tasks that can’t be coded (for example, fingerprint scanning: “now scanning”). |
| * Use comments in code to explain understanding of programming structures, as well as pointing out refinements and on-going testing of code. |
| * Keep backups of your files. Save every 10-15 minutes of work. |
| **Getting Started** |
| * Look through past class notes, and resources from the website to help you plan. |
| **Authentication Strategies** |
| * Acknowledge all code snippets, tutorials, advice, information, or help given. |
| * Students may be asked to explain their solution, or parts there-of, to determine authenticity. |

#### Appendix A: QCAA Years 9 and 10 Digital Technologies standard elaborations (contextualised)

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|  |  | | **A** | **B** | **C** | **D** | **E** |
| **Knowledge and understanding** | *Digital Systems* | *Section 1: Explore and Develop* | **comprehensive** explanation of: • the security implications of the interaction between hardware, software and users | **detailed** explanation of: • the security implications of the interaction between hardware, software and users | explanation of: • the security implications of the interaction between hardware, software and users | **description** of: • the security implications of the interaction between hardware, software and users | **statements about**: • the security implications of the interaction between hardware, software and users |
| **Processes and production skills** | *Generating and designing; producing and implementing* | *Section 2A: Generate* | **proficient** implementation of modular programs | **effective** implementation of modular programs | implementation of modular programs | **partial** implementation of modular programs | **fragmented** implementation of modular programs |
| *Evaluating* | *Section 2B: Evaluate* | **discerning** evaluation of digital solution in terms of risk, sustainability and potential for innovation and enterprise | **informed** evaluation of digital solution in terms of risk, sustainability and potential for innovation and enterprise | evaluation of digital solution in terms of risk, sustainability and potential for innovation and enterprise | **explanation** of digital solution | **description** of digital solution |

*This will be marked digitally via the submission platform.*

#### Appendix B: Australian Curriculum content descriptions

This assessment instrument is used to allow students to formally demonstrate the following Australian Curriculum Digital Technologies Years 9 and 10 Content Descriptions:

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| **Explicitly measured** | |
| K&U | Investigate the role of hardware and software in managing, controlling, and securing the movement of and access to data in networked digital systems |
| P&PS | Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language |
| P&PS | Evaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability, and provide opportunities for innovation and enterprise |
| **Implicit to the task** (not formally measured) | |
| K&U | Analyse simple compression of data and how content data are separated from presentation |
| P&PS | Develop techniques for acquiring, storing, and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements |
| P&PS | Analyse and visualise data to create information and address complex problems, and model processes, entities and their relationships using structured data |
| P&PS | Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs |
| P&PS | Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics |
| P&PS | Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases |
| P&PS | Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts, and legal responsibilities |
| P&PS | Plan and manage projects using an iterative and collaborative approach, identifying risks, and considering safety and sustainability |

**Key**:

K&U: Knowledge and Understanding

P&PS: Processes and Production Skills