# Assessment event 2 of 4: Project Report

## Criteria

### Unit code and name

Cluster | ICT Analysis

BSBCRT404 | Apply advanced critical thinking to work processes

ICTICT426 | Identify and evaluate emerging technologies and practices

ICTSAS432 | Identify and resolve client ICT problems

### Qualification/Course code and name

Select your Qualification/Course code and name from the dropdown.

Code | Course name

## Student details

Student name

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Student number

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Version: 20231120

Date created: 20 November 2023

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# Part 1: Report details

Report to: ICT Support Manager

Report author: Daniel Ly, ICT Support team member

# Part 2: Emerging technologies

## Introduction

Introduce your topic and describe the purpose of this section of the report.

This is a research project for emerging technologies and our project goal is to improve the services provided by our ICT service desk through the implementation of new and emerging technologies. The main reason for this report is that our ICT support manager is concerned that our current processes, systems and technology for the ICT service desk function do not align with our strategic goals or provide the quality and efficiency of service that we strive for here at Gelos Enterprises.

## Findings

Reference information sources in footnotes or reference list.

### Technology 1

Table 1 Research findings

| Criteria | Description |
| --- | --- |
| Name | Post-quantum cryptography (PQC) |
| Purpose, function, attributes and features | Post-quantum cryptography (PQC) is a set of algorithms designed to secure against both classical and quantum-computing attacks. PQC will replace existing asymmetric encryption, which Gartner predicts will be fully breakable by 2034, deprecating existing classical encryption methodologies and processes. [https://www.gartner.com/en/articles/post-quantum-cryptography] |
| General design and operating principles | Post-quantum cryptography (PQC) aims to protect data against classical and quantum computer attacks by using complex mathematical problems, such as lattice-based cryptography, which are difficult for quantum computers to solve. PQC algorithms employ larger key sizes for security and are designed for compatibility with existing systems for easy integration. They utilize a defence-in-depth approach by combining multiple techniques and offer a variety of algorithms for encryption and digital signatures. Organizations like NIST are working on standardizing these algorithms, while crypto-agility ensures flexibility and upgradeability. The goal is to create practical systems that secure communications in the quantum computing era. [https://en.wikipedia.org/wiki/Post-quantum\_cryptography] |
| Advantages | 1. Future-proof security: PQC algorithms are designed to withstand attacks from both classical and quantum computers, ensuring long-term data protection. [https://www.quantumize.com/quantumize-post-quantum-security/] 2. Seamless integration: PQC solutions can be easily implemented in existing systems through software updates, making adoption more practical. [https://www.quantropi.com/differences-between-classical-quantum-post-quantum-cryptography/] 3. Quantum-resistant algorithms: PQC uses complex mathematical problems that are believed to be difficult for quantum computers to solve, providing stronger security. [https://en.wikipedia.org/wiki/Post-quantum\_cryptography] |
| Organisational opportunities | 1. Enhanced data security: Organizations can future proof their security by implementing PQC algorithms, protecting sensitive data against potential quantum computer attacks. [https://terraquantum.swiss/news/post-quantum-cryptography-101-why-your-organization-needs-to-pay-attention] 2. Competitive advantage: Early adopters of PQC can gain a competitive edge by demonstrating advanced security measures to clients and partners. [https://www.globenewswire.com/news-release/2024/12/18/2998876/28124/en/Post-Quantum-Cryptography-Market-Research-Report-2024-Market-to-Reach-17-69-Billion-by-2034-from-356-4-Million-in-2023-as-a-CAGR-of-41-47-Fueled-by-Future-Quantum-Computing-Risks.html] 3. Regulatory compliance: Implementing PQC can help organizations meet evolving cybersecurity regulations and standards, particularly in sectors like finance and healthcare |
| Disadvantages | Lack of easy replacement options, Varied performance requirements, Lack of organizational knowledge, Lack of vendor preparedness |
| Organisational threats | 1. Lack of preparedness: Despite awareness of the quantum threat, many organizations lack the cryptographic visibility, skills, and computing power needed to effectively activate a post-quantum cryptography plan. [https://www.infosecurity-magazine.com/news/orgs-unprepared-postquantum-threat/] 2. Infrastructure obsolescence: Current Public Key Infrastructure (PKI) certificates, which form the backbone of secure digital communications, may become unsafe to use as early as 2029. [https://blog.hidglobal.com/post-quantum-cryptography-why-your-organization-needs-prepare-now] 3. Competitive disadvantage: Organizations that fail to adopt post-quantum cryptography early may fall behind competitors in terms of data security and trustworthiness. |
| Impact on current technologies and practices | Infrastructure overhaul:   * Businesses will need to upgrade their IT infrastructure to support quantum-resistant algorithms. * This includes updating servers, storage solutions, and communication systems to handle PQC without disrupting operations   Staff training and awareness:   * Employees at all levels will need education on PQC risks and best practices. * IT teams will require specialized training to implement and manage PQC solutions effectively. |
| Overall evaluation of the potential application of this technology for the ICT Service Desk function | Post-quantum cryptography (PQC) offers significant potential for enhancing the ICT Service Desk function by improving data security, modernizing infrastructure, and ensuring long-term compliance. While implementation will require substantial updates to existing systems and staff training, it presents an opportunity to future-proof operations against quantum threats. The ICT Service Desk can leverage PQC to demonstrate leadership in cybersecurity, potentially improving user trust and satisfaction. However, the transition will require careful planning, risk assessment, and ongoing adaptation to evolving standards. Despite these challenges, early adoption of PQC can position the ICT Service Desk as a valuable resource for quantum-safe practices within the organization, contributing to overall cybersecurity resilience. [https://www.cyber.gov.au/sites/default/files/2023-05/PROTECT%20-%20Planning%20for%20Post-Quantum%20Cryptography%20(May%202023).pdf] |

### Technology 2

Table 2 Research findings

| Criteria | Description |
| --- | --- |
| Name | Agentic AI |
| Purpose, function, attributes and features | Agentic AI is an advanced form of artificial intelligence designed to operate autonomously, make decisions, and adapt to complex situations. Its purpose is to handle sophisticated tasks and workflows with minimal human intervention. |
| General design and operating principles | designed to operate autonomously, make decisions, and adapt to complex situations with minimal human intervention. They can be autonomous, goal orientated, adaptable, advanced reasoning, learning capabilities, contextual understanding, perception, planning and reasoning, tool use. [https://github.com/microsoft/ai-agents-for-beginners/blob/main/03-agentic-design-patterns/README.md] |
| Advantages | 1. Enhanced decision-making: By analyzing vast amounts of data and recognizing patterns, agentic AI provides more informed, data-driven decisions in real-time. [https://digitaldefynd.com/IQ/pros-cons-of-agentic-ai/] 2. Improved customer experiences: AI can personalize interactions, provide quick responses to inquiries, and offer tailored recommendations, enhancing overall customer satisfaction. [https://digitaldefynd.com/IQ/pros-cons-of-agentic-ai/] 3. Automation of repetitive tasks: Agentic AI excels at handling monotonous and time-consuming tasks, reducing human error and freeing up employees for more meaningful work. [https://digitaldefynd.com/IQ/pros-cons-of-agentic-ai/] |
| Organisational opportunities | 1. Personalized customer engagement: AI agents can deliver hyper-personalized interactions, tailored recommendations, and autonomous support, enhancing customer experiences. [https://7riversinc.com/insights/what-is-agentic-ai-the-future-of-organizational-agility-intelligence-and-ultimately-business-growth/] 2. Innovation and growth acceleration: Agentic AI can identify emerging trends, prototype and test new ideas, accelerating time to market and driving innovation. [https://7riversinc.com/insights/what-is-agentic-ai-the-future-of-organizational-agility-intelligence-and-ultimately-business-growth/] 3. Increased organizational agility: Adaptive AI systems can respond quickly to disruptions like supply chain breakdowns or market shifts, ensuring business continuity. [https://7riversinc.com/insights/what-is-agentic-ai-the-future-of-organizational-agility-intelligence-and-ultimately-business-growth/] |
| Disadvantages | 1. Lack of transparency: Agentic AI systems often operate as "black boxes," making it difficult to understand their decision-making processes. [https://digitaldefynd.com/IQ/pros-cons-of-agentic-ai/] 2. Ethical and bias issues: AI systems can perpetuate or amplify existing biases, leading to unfair or discriminatory outcomes. [https://digitaldefynd.com/IQ/pros-cons-of-agentic-ai/] 3. Job displacement: The automation capabilities of agentic AI may lead to significant job losses in various industries. [https://digitaldefynd.com/IQ/pros-cons-of-agentic-ai/] |
| Organisational threats | 1. Security vulnerabilities: AI systems can become targets for cyberattacks, potentially leading to data breaches and unauthorized access to sensitive information. [https://right-hand.ai/blog/agentic-ai-in-cybersecurity/] 2. Cascading failures: A compromise in one AI agent could potentially affect multiple areas of an organization's infrastructure. [https://www.techmonitor.ai/comment-2/agentic-ai-cyber-risks/] 3. Data poisoning and prompt injection: These attacks can manipulate AI decision-making processes, causing incorrect or harmful outcomes. [https://www.techmonitor.ai/comment-2/agentic-ai-cyber-risks/] |
| Impact on current technologies and practices | 1. Automation and efficiency: Agentic AI is streamlining complex tasks and workflows, allowing human employees to focus on more strategic and creative work. For example, in logistics, AI systems can autonomously adjust delivery routes and schedules based on real-time conditions. [https://www.ibm.com/think/topics/agentic-ai-vs-generative-ai] 2. Decision-making: By analysing vast amounts of data in real-time, agentic AI is enhancing decision-making processes in fields like finance, where it can monitor market fluctuations and automatically adjust portfolio allocations. [https://www.ibm.com/think/topics/agentic-ai-vs-generative-ai] |
| Overall evaluation of the potential application of this technology for the ICT Service Desk function | Agentic AI has the potential to revolutionize ICT Service Desk operations by significantly improving efficiency, availability, and scalability. Its ability to handle complex tasks autonomously and continuously learn from interactions makes it a powerful tool for modern IT support. However, organizations must carefully consider implementation challenges, security concerns, and ethical implications when adopting this technology. With proper planning and management, agentic AI can transform ICT Service Desks into more proactive, efficient, and user-centric support systems. |

### Technology 3

Table 3 Research findings

| Criteria | Description |
| --- | --- |
| Name |  |
| Purpose, function, attributes and features |  |
| General design and operating principles |  |
| Advantages |  |
| Organisational opportunities |  |
| Disadvantages |  |
| Organisational threats |  |
| Impact on and changes required to current technologies and practices |  |
| Overall evaluation of the potential application of this technology for the ICT Service Desk function |  |

### Conclusion

Evaluation of research findings, selection of one ICT technology to implement and explanation of how it will resolve the ICT problem.

### Recommendations

Table 4 Recommendations

| No. | Action | Job role / Department responsible |
| --- | --- | --- |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |

# Part 3: Emerging practices

## Introduction

Introduce your topic and describe the purpose of this section of your report.

## Findings

Reference information sources in footnotes or reference list.

### Practice 1

Table 5 Research findings

| Criteria | Description |
| --- | --- |
| Name |  |
| Purpose, function, attributes and features |  |
| Advantages |  |
| Organisational opportunities |  |
| Disadvantages |  |
| Organisational threats |  |
| Impact on current technologies and practices |  |
| Overall evaluation of the potential application of this practice to employees and the organisation |  |

### Practice 2

Table 6 Research findings

| Criteria | Description |
| --- | --- |
| Name |  |
| Purpose, function, attributes and features |  |
| Advantages |  |
| Organisational opportunities |  |
| Disadvantages |  |
| Organisational threats |  |
| Impact on current technologies and practices |  |
| Overall evaluation of the potential application of this practice to employees and the organisation |  |

### Practice 3

Table 7 Research findings

| Criteria | Description |
| --- | --- |
| Name |  |
| Purpose, function, attributes and features |  |
| Advantages |  |
| Organisational opportunities |  |
| Disadvantages |  |
| Organisational threats |  |
| Impact on current technologies and practices |  |
| Overall evaluation of the potential application of this practice to employees and the organisation |  |

### Conclusion

Evaluation of research findings, selection of one ICT practice to implement and explanation of how it will resolve the ICT problem.

### Recommendations

Table 8 Recommendations

|  |  |  |
| --- | --- | --- |
| No. | Action | Job role / Department responsible |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |

### Reference list

Provide references where required, using the Harvard reference style. TAFE NSW Libraries [Researching and Referencing: Referencing Skills](https://tafensw.libguides.com/research/referencing) provides Harvard guides, checklists and resources.