# 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

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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 | Spatial Computing |
| Purpose, function, attributes and features | Spatial computing works by mapping indoor and outdoor physical spaces — including the people and things within them. The technology then anchors digital content seamlessly within the physical world, enabling users to interact with it in a way that feels realistic. |
| General design and operating principles | Spatial computing relies on multiple immersive technologies, including:  Augmented reality (AR): AR overlays virtual elements onto the real world. In the context of spatial computing, the AR aligns and orchestrates virtual content with physical objects to create seamless interactive experiences.  Mixed reality (MR): Mixed reality is the merging of real and virtual worlds, where physical and graphical objects appear to interact and integrate naturally. MR includes an underlying group of technologies encompassing a spectrum of immersive displays and interactive systems.  Metaverse: Metaverse interconnects digital spaces in which users can interact, socialize and create. Spatial computing ensures the accurate positioning of users and synchronizes their actions.  Embedded technologies are also involved, including eye tracking to monitor what users are looking at, speech recognition to enable voice commands, and handheld controllers and motion sensors that enable users to touch and move virtual objects. 5G and 6G technology is also required to provide the necessary speed and bandwidth for real-time interaction. |
| Advantages | 1. Enhanced user experience: It creates more natural and intuitive interfaces for interacting with digital systems, improving user engagement and satisfaction. [https://www.tutorialspoint.com/spatial-computing-basics-working-advantages-disadvantages-and-applications] 2. Improved productivity: By providing contextual information overlays and enabling new physical workflows, spatial computing enhances situational awareness and decision-making abilities. [https://www.tutorialspoint.com/spatial-computing-basics-working-advantages-disadvantages-and-applications] 3. Visualization and simulation: Users can visualize and interact with complex data, designs, and concepts in 3D, facilitating better understanding and analysis [https://www.tutorialspoint.com/spatial-computing-basics-working-advantages-disadvantages-and-applications] |
| Organisational opportunities | 1. Enhanced collaboration: Virtual shared spaces enable remote teams to work together more effectively, improving communication and fostering teamwork. [https://appinventiv.com/blog/spatial-computing-in-enterprise/] 2. Improved training and education: Immersive, interactive experiences accelerate learning and skill development, particularly in high-risk industries like manufacturing and healthcare. [https://appinventiv.com/blog/spatial-computing-in-enterprise/] 3. Increased operational efficiency: Real-time 3D visualizations and data overlays streamline processes in logistics, supply chain management, and manufacturing. [https://appinventiv.com/blog/spatial-computing-in-enterprise/] |
| Disadvantages | 1. Complex technology: Spatial computing involves advanced and sophisticated hardware and software systems, requiring specialized expertise. 2. High costs: The technology is expensive due to components like AI, AR, VR, MR, and IoT. 3. Privacy and security concerns: Sensors and cameras used to capture data from the physical world may collect personal and sensitive information. |
| Organisational threats | 1. Return on investment uncertainties: Due to the newness of the technology, organizations may face difficulties in justifying the investment and demonstrating clear ROI. [https://www.innovativehumancapital.com/article/the-shift-to-spatial-computing-understanding-the-challenges-and-opportunities-for-organizations] 2. User acceptance and adoption barriers: Employees may resist changes to established workflows and face challenges adapting to new interfaces. [https://www.innovativehumancapital.com/article/the-shift-to-spatial-computing-understanding-the-challenges-and-opportunities-for-organizations] 3. Legal and liability issues: Spatial computing devices raise questions about liability for user mistakes or damages caused while using the technology. [https://www.innovativehumancapital.com/article/the-shift-to-spatial-computing-understanding-the-challenges-and-opportunities-for-organizations] |
| Impact on and changes required to current technologies and practices | 1. Infrastructure upgrades: Organizations will need to invest in new hardware and software to support spatial computing, including high-resolution displays, advanced sensors, and powerful processing capabilities. [https://www.knowledgenile.com/blogs/how-does-spatial-computing-integrate-with-existing-technology-systems] 2. Network enhancements: The adoption of 5G networks is crucial to enable fast and reliable data transfer for spatial computing applications. [https://www.knowledgenile.com/blogs/how-does-spatial-computing-integrate-with-existing-technology-systems] 3. Cloud integration: Existing cloud systems will need to be optimized to handle the increased data processing and storage demands of spatial computing. [https://www.knowledgenile.com/blogs/how-does-spatial-computing-integrate-with-existing-technology-systems] |
| Overall evaluation of the potential application of this technology for the ICT Service Desk function | Spatial computing has the potential to revolutionize ICT Service Desk operations by providing more intuitive and efficient ways to visualize, diagnose, and resolve IT issues. While challenges exist, the benefits of improved remote support, enhanced collaboration, and more effective self-service capabilities make it a promising technology for forward-thinking IT organizations. As the technology matures and becomes more accessible, its integration into service desk functions could significantly enhance the quality and efficiency of IT support services. |

### Conclusion

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

Based on the evaluation of agentic AI, spatial computing, and post-quantum cryptography, I recommend implementing agentic AI for Gelos' ICT needs. Agentic AI offers:

• Enhanced IT support: Autonomous handling of complex tasks and proactive issue resolution.

• Improved efficiency: Automation of repetitive tasks and streamlined workflows.

• Adaptive learning: Continuous improvement through interaction.

• Accessibility: Natural language processing benefits users with disabilities.

• Cost-effectiveness: Long-term savings through improved efficiency.

• Integration: Complements existing systems without replacing them.

Agentic AI addresses Gelos' ICT problems while ensuring accessibility, cost-effectiveness, and seamless integration with current technologies. It will enable more efficient IT operations, improved user support, and adaptive problem-solving capabilities across the organization.

### Recommendations

Table 4 Recommendations

| No. | Action | Job role / Department responsible |
| --- | --- | --- |
| 1 | present the agentic AI proposal to the ICT Governance Group as per the ICT Governance Policy. | CTO |
| 2 | conduct comprehensive consultations with relevant departments (HR, Finance, etc.) to identify specific needs and use cases for the agentic AI. | ICT Department, collab with HR, finance |
| 3 | follow the ICT Procurement and Installation Policy to source, evaluate, and select the AI solution | ICT Department |
| 4 | As outlined in the ICT Procurement and Installation Policy (Section 3.2), the ICT Systems Support team must test the AI software for conflicts, compatibility, and interoperability. | ICT Systems Support team |
| 5 | creates detailed Installation and Implementation Plans as per the ICT Procurement and Installation Policy (Step 6 in Table 1), covering preparation, procedures, testing, and timelines (Section 4.1). | ICT Support team |
| 6 | identifies potential risks associated with the AI implementation (security breaches, data privacy, etc.) and develops mitigation strategies, aligning with Guiding Principle 9 of the ICT Governance Policy. | ICT Support team and CTO |

# 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.