

CSSA Enterprise Computing Trial Exam 2025

Marking Guidelines

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Question 1 1 mark

Answer:

Feedback is gathered and used to improve the next iteration of the project.

Question 2 1 mark

Answer:

Quantitative data is measured and expressed numerically, while qualitative data is descriptive and deals with characteristics.

Question 3 1 mark

Answer:

- | |
|---|
| ☒ Telling data-driven stories. |
| ☒ Simplifying complex information. |
| ☐ Enhancing data storage capabilities. |
| ☒ Highlighting significant trends and insights. |

Question 4 1 mark

Answer:

Controlling and optimising machinery in an industrial process.

Question 5 1 mark

Answer:

Blockchain verifies data by using cryptographic hashes, with each block linked to the previous, to create an immutable ledger.

Question 6 1 mark

Answer:

Encryption

Question 7 1 mark

Answer:

A folder of image files from a company's marketing campaign.

Question 8 1 mark

Answer:

- | |
|---|
| ☒ Quantum computing |
| ☐ Optic fibre technology |
| ☒ Infrastructure as a service |
| ☒ Internet of things communication protocol |

Question 9 1 mark

Answer:

Diagnose flu (CF = 0.8) based on fever, cough, and body ache

Question 10 2 marks

Criteria	Marks
Correctly matches ALL tools with their characteristics	2
Correctly matches TWO tools with their characteristics	1

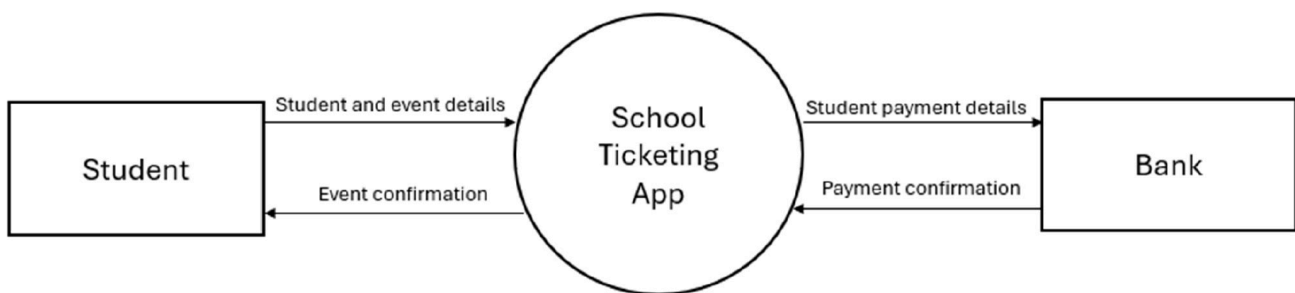
Answer:

	Decision tree	Gantt chart	Implementation plan	System flowchart
Displays dependencies and resource allocations	☐	☒	☐	☐
Visual representations of how data is processed within a system	☐	☐	☐	☒
Organises data into a series of choices and their possible outcomes	☒	☐	☐	☐
Describes how staff will be trained to use the new enterprise system	☐	☐	☒	☐

Question 11 2 marks

Criteria	Marks
Correctly completes the Level 0 data flow diagram	2
Provides some correct details	1

Sample answer:



Question 12 3 marks

Criteria	Marks
Correctly identifies ALL formulas	3
Correctly identifies TWO formulas	2
Correctly identifies ONE formula	1

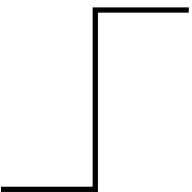
Sample answer:

- (i) Cell E3: =AVERAGE(B4:E4)
- (ii) Cell F3: =VLOOKUP(E3,\$A\$12:\$B\$16,2)
- (iii) Cell G3: =IF(F3="A", "Yes", "No")

Question 13 (a) 2 marks

Criteria	Marks
- Adds appropriate fields into each of the tables to produce a correctly normalised schema - Indicates the primary and foreign keys	2
- Provides most of the fields to produce a normalised schema, OR - Provides some relevant fields to produce a normalised schema and indicates AT LEAST ONE primary OR foreign key	1

Answer:

Doctor		Appointment		Patient
✓ DoctorID (P)		✓ AppointmentID (P)		PatientID (P)
✓ DoctorFirstName		✓ DoctorID (F)		PatientFirstName
✓ DoctorLastName		✓ PatientID (F)		PatientLastName
		✓ AppointmentDate		PatientDOB
		✓ AppointmentTime		

Question 13 (b) 2 marks

Criteria	Marks
Provides a correct SQL statement	2
Shows some understanding of SQL	1

Sample answer:

```
SELECT PatientFirstName, PatientLastName, PatientDOB
FROM Patient
WHERE PatientDOB >= '2007-01-01'
ORDER BY PatientDOB ASC;
```

Question 14 2 marks

Criteria	Marks
Describes the role of an inference engine in an expert system	2
Provides some relevant information	1

Sample answer:

The inference engine applies logical reasoning to the knowledge base to solve problems or draw conclusions. It evaluates rules and facts to provide advice or solutions based on user queries.

Question 15 3 marks

Criteria	Marks
Explains how prototypes can be used to inform the requirements and limitations of an enterprise system with an appropriate example	3
Describes how prototypes can be used to inform the requirements and/or limitations of an enterprise system with an example	2
Provides an example or some relevant information	1

Sample answer:

Prototypes can be used to test the functionality and usability of an enterprise system before full implementation. They help identify limitations, such as missing features or performance issues, by allowing users to interact with a working model. For example, a business could create a prototype of a supply chain management system to test if it effectively tracks inventory and generates reports in real-time. Feedback from users interacting with the prototype can highlight necessary improvements.

Question 16 4 marks

Criteria	Marks
Identifies the prototyping development approach and ONE other development approach with justification of the choices showing thorough understanding of system development and the scenario	4
- Identifies a suitable development approach and provides a thorough justification OR - Identifies a suitable combination of development approaches and shows some understanding of each method	3
- Shows some understanding of development approaches OR - Identifies a suitable combination of development approaches	2
Identifies a feature of development approaches	1

Sample answer:

The local sports club should use the outsourcing and prototyping development approaches to update their membership information system. The outsourcing development approach involves contracting an external company that specialises in the development of such services. The sports club does not have the necessary software development skills and expertise to develop the new system. Using the outsourcing development approach will allow the sports club staff to focus on their day-to-day jobs.

The external company with extensive experience in systems development will provide a higher quality system that better meets the requirements.

In a prototyping development approach a limited model of the future system is developed to demonstrate the system to the users. The sports club can use this prototype model to verify and validate the user requirements of the new system. This development approach can increase the timeframe for the project due to the extra time taken to develop the model and manage new requirements from the users as they use the model. With proper management though, this development approach is successful at delivering systems closely aligned with the user requirements.

Answers may include:

Agile, Traditional and Customisation development approaches with appropriate justification for their use.

Question 17 (a) 3 marks

Criteria	Marks
• Outlines the use of big data and data warehousing in SmartShop's operations, considering volume, variety, and velocity, in the context of ShopSmart's operations	3
• Outlines the use of big data and/or data warehousing in SmartShop's operations, considering volume and/or variety and/or velocity, with some reference to ShopSmart's operations	2
• Provides some relevant information	1

Sample answer:

- **Volume:** With the rapid growth of the company and the increasing number of customers, the volume of data being generated daily is substantial. ShopSmart needs to be able to store and process large amounts of data efficiently.
- **Variety:** The data collected by ShopSmart comes in multiple forms, such as structured data (purchase history, product information) and unstructured data (user reviews, customer feedback, website clickstream data). The company uses data warehousing to consolidate and organise this diverse data into a central repository for easier analysis and decision-making.
- **Velocity:** The speed at which ShopSmart generates data is high, especially with real-time customer transactions and web interactions. To manage this, the company likely uses realtime processing techniques within its data warehousing solution, enabling quick insights for timely decisions, such as product recommendations or inventory restocking.

Question 17 (b) 3 marks

Criteria	Marks
Explains the application of data modelling and the automation of systems in ShopSmart's operations	3
Describes the application of data modelling and/or the automation of systems in ShopSmart's operations	2
Provides some relevant information	1

Sample answer:

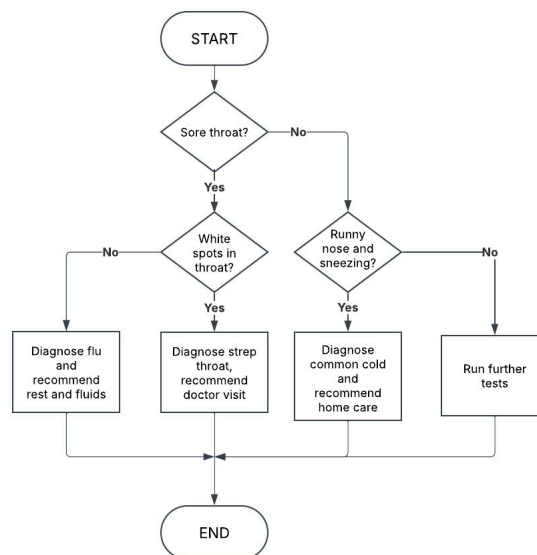
ShopSmart uses data modelling to analyse customer behaviour and predict future purchasing patterns. By building predictive models, the company can make data-driven decisions on which products to recommend to specific customers or regions, personalising the shopping experience and improving sales.

ShopSmart has automated its inventory management system. By using automated systems, the company can restock products based on predicted demand, reducing human intervention and ensuring that inventory is always aligned with customer needs. Automation also enhances operational efficiency, reducing the risk of errors in stock management and improving customer satisfaction.

Question 18 4 marks

Criteria	Marks
Creates a substantially correct flowchart that shows a thorough understanding of the decision-making process using IF-THEN rules in the medical expert system	4
Creates a flowchart to that shows a sound understanding of the decision-making process using mostly correct IF-THEN rules in the medical expert system	3
Creates a flowchart that shows some understanding of the rules in the medical expert system	2
- Identifies a feature of a flowchart OR - Creates a diagram that shows a basic understanding of the rules in the medical expert system	1

Sample answer:



Question 19 4 marks

Criteria	Marks
Explains the methods the project team can use to verify and validate the CRM system, using examples	4
Explains a method the project team can use to verify and validate the CRM system and describes another, using examples	3
- Describes a method the project team can use to verify and validate the CRM system OR - Outlines methods the project team can use to verify and validate the CRM system	2
Provides some relevant information	1

Sample answer:

The project team could evaluate test data, such as a set of sample customer profiles, to verify that the CRM system correctly stores, retrieves, and updates customer information. For example, they might test if entering a new customer's details reflects accurately in all linked reports and dashboards.

Trialling the operation and maintenance documentation ensures employees can use the system effectively and resolve issues independently. For instance, the team could ask staff to follow the documentation to perform tasks like updating customer information or troubleshooting login problems, ensuring the instructions are clear and functional.

Answers could include:

- Reviewing the impact of system implementation within relevant environments
- Modifying designs to improve functionality
- Testing, evaluating, and maintaining the developed system

Question 20 (a) 3 marks

Criteria	Marks
Constructs a data dashboard that contains TWO different data visualisations, that accurately represent key trends from the given scenario.	3
Constructs a data visualisation which represented data from the given scenario.	2
Provides some relevant information.	1

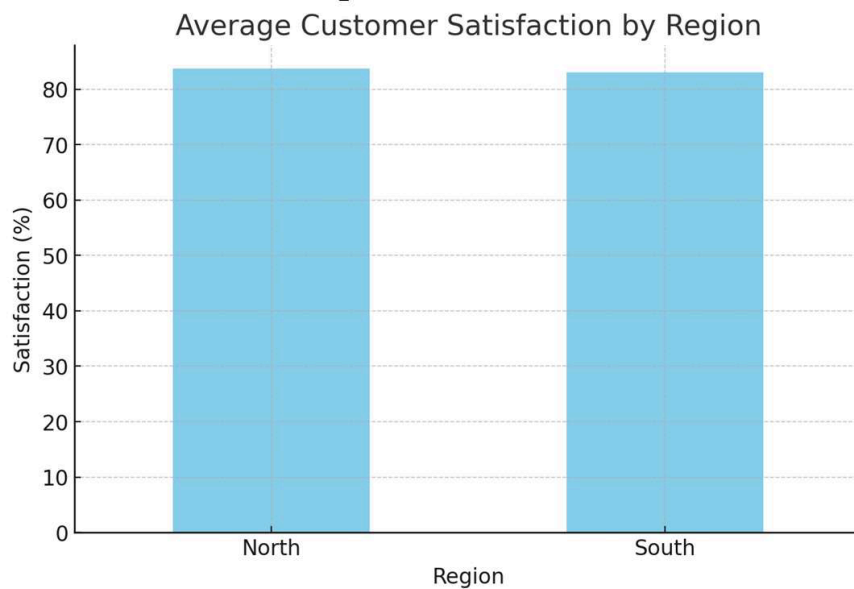
Sample answer:

Four Sample Data Visualisations provided. NOTE: Only two required.

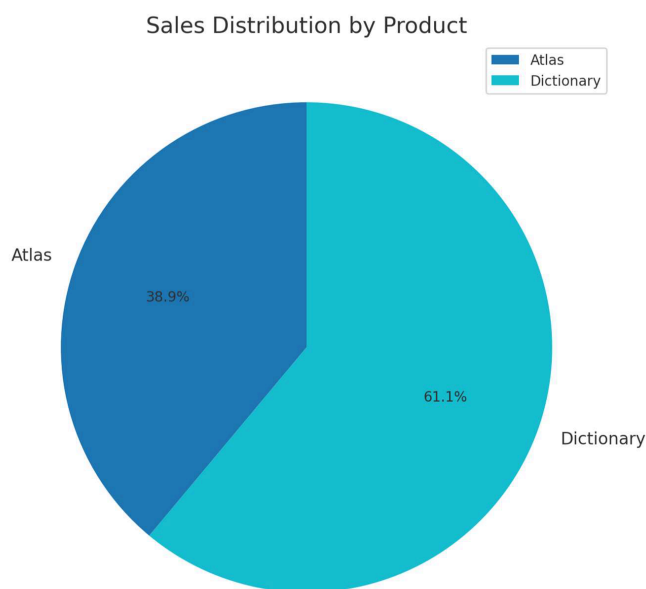
Data Visualisation Sample 1 - Total Sales and Profit by Month: This bar chart compares the total sales and profit for each month, helping to identify peak sales periods and profitability trends.



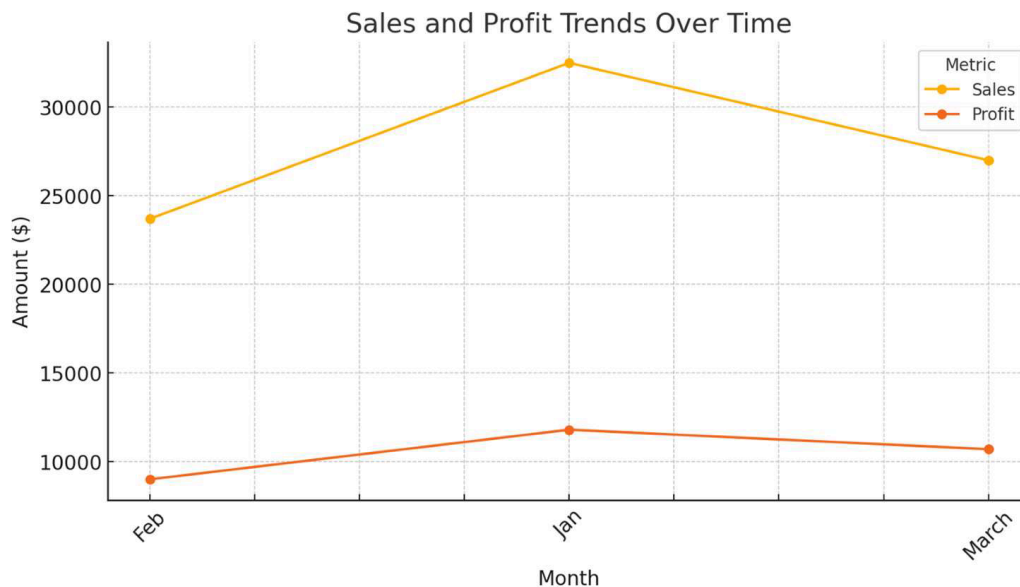
Data Visualisation Sample 2 - Average Customer Satisfaction by Region: This bar chart shows the average customer satisfaction percentage for each region, helping to analyse regional performance in terms of customer experience.



Data Visualisation Sample 3 - Sales Distribution by Product. This visualisation helps illustrate the proportion of total sales contributed by each product category.



Data Visualisation Sample 4 - line chart illustrating the Sales and Profit Trends Over Time. This visualisation helps track fluctuations in sales and profit across different months, making it easier to identify trends and seasonal variations.



Question 20 (b) 3 marks

Criteria	Marks
Describes TWO relevant impacts data scale could have on the book shop	3
Outlines the impact data scale could have on the given scenario	2
Provides some relevant information	1

Sample answer:

The scale of data in the system affects how customer information is collected, stored, and used.

Firstly, the volume of raw data is very large, as every customer's browsing history, purchases, and interactions are stored. This requires advanced storage solutions, such as cloud servers, to keep data organised and accessible.

Secondly, real-time tracking allows the company to monitor customer activity as they are browsing and adding items to their cart and, if the customer takes longer than a specified time to check out, offer instant discounts to encourage purchases therefore influencing customer decisions.

Overall, data scale impacts how businesses manage large amounts of information and use it to personalise services.

Question 21 (a) 1 mark

Answer:

Pilot

Question 21 (b) 3 marks

Criteria	Marks
Explains the role of intelligent systems in surveillance with reference to the scenario	3
Describes the role of intelligent systems in surveillance	2
Provides some relevant information	1

Sample answer:

Intelligent systems play a crucial role in surveillance within the enterprise computing system at HealthPlus by monitoring patient data and ensuring the security and privacy of sensitive information. These systems can continuously analyse data from various sources, such as electronic health records (EHR), wearable devices, and lab results, to detect any unusual patterns or anomalies that may indicate potential security breaches or unauthorised access. Additionally, intelligent systems can help in monitoring the compliance of healthcare practices with legal and ethical standards, ensuring that patient data is handled appropriately. By providing real-time alerts and automated responses to potential threats, intelligent systems enhance the overall security and integrity of the healthcare provider's operations, thereby protecting patient information and maintaining trust.

Question 21 (c) 3 marks

Criteria	Marks
Explains how machine learning and statistical modelling are used to analyse big data with reference to the scenario	3
Describes how machine learning and statistical modelling are used to analyse big data	2
Provides some relevant information	1

Sample answer:

Intelligent systems play a crucial role in surveillance within the enterprise computing system at HealthPlus by monitoring patient data and ensuring the security and privacy of sensitive information. These systems can continuously analyse data from various sources, such as electronic health records (EHR), wearable devices, and lab results, to detect any unusual patterns or anomalies that may indicate potential security breaches or unauthorised access. Additionally, intelligent systems can help in monitoring the compliance of healthcare practices with legal and ethical standards, ensuring that patient data is handled appropriately. By providing real-time alerts and automated responses to potential threats, intelligent systems enhance the overall security and integrity of the healthcare provider's operations, thereby protecting patient information and maintaining trust.

Question 22 (a) 3 marks

Criteria	Marks
Explains how OLAP can be used to analyse visitor data in this museum	3
Outlines how OLAP can be used to analyse visitor data in this museum	2
Provides some relevant information	1

Sample answer:

OLAP is used to analyse data from multiple perspectives by organising it into a multidimensional format. For example, it allows the museum to compare visitor numbers across different exhibits, time periods, or age groups. This helps the museum identify popular exhibits and allocate resources effectively to improve visitor satisfaction.

Question 22 (b) 3 marks

Criteria	Marks
Explains the role of TWO hardware components used in the museum's intelligent system	3
Outlines the role of hardware components used in the museum's intelligent system	2
Identifies hardware components	1

Sample answer:

One hardware component is motion sensors, which detect visitor movements to activate exhibits or adjust content based on their actions and gestures, creating an interactive experience. Another component is touchscreens, which allow visitors to select and explore information directly, providing a hands-on and engaging way to learn. These components enhance the system's responsiveness and make the museum visit more immersive.

Answers could include:

- VR Headsets
- Cameras or infrared sensors to detect hand movements or gestures for interacting with digital displays
- Microphones and voice recognition hardware for hands-free navigation
- AR glasses or tablets to overlay digital information onto physical exhibits
- Haptic devices to provide tactile feedback, eg vibrating controllers
- Microcontrollers embedded to control exhibit functions like lighting, sounds or movement
- High Resolution projectors for creating immersive, large-scale visual displays or virtual tours
- 3D scanners to allow visitors to explore detailed 3D models of artifacts that are too fragile or small to handle

Question 23 (a) 3 marks

Criteria	Marks
Describes TWO strategies to be used with references to the scenario	3
- Describes ONE strategy and limited reference to another OR - Outlines TWO strategies to be used	2
Provides some relevant information about strategies to be used	1

Sample answer:

The data scientist can use processes to verify data ownership and conduct validation checks to maintain data quality and data security when developing the football clubs data visualisations.

The data scientist must ensure that the players/coaches have given permission for their data to be used in this project. The data scientist should establish protocols to confirm that the player statistics are provided by a trusted source, and the data is correctly attributed to the rightful owners. The data scientist then needs to implement processes to only provide authorised access to this data to ensure data security. For example, records should be maintained of who accesses the data with the timestamp so you can cross check this information with the list of authorised users.

The data scientist should design and implement validation rules to automatically check the accuracy, consistency and completeness of the player statistics before the data is used in any data visualisations. An example is checking that all dates are entered in the Australian format of DD/MM/YYYY without a timestamp. These validation checks will maintain the quality of the data.

Answers could include:

- setting up processes for verifying data ownership
- ensuring proper validation checks
- implementing risk mitigation measures

Question 23 (b) 3 marks

Criteria	Marks
Describes TWO online communication systems that allow collaboration between the data scientist and the group of officials and representatives	3
Outlines communication systems that allow collaboration between the data scientist and the group of officials and representatives	2
Provides some relevant information	1

Question 24 4 marks

Criteria	Marks
Explains the social, ethical, and legal implications of this company using personal data for personalised advertisements and service optimisation and clearly shows the impact on individuals, society, and the environment	4
Describes the social, ethical, and/or legal implications of this company using personal data for personalised advertisements and service optimisation with some reference to the impact on individuals, society, and/or the environment	3
Outlines the social, ethical, and/or legal implications of this company using personal data for personalised advertisements and service optimisation with limited reference to the impact on individuals, society, and/or the environment	2
Provides some relevant information	1

Sample answer:

Socially, the widespread collection and use of personal data can lead to changes in the nature of work and interpersonal relationships. For example, personalised advertisements may influence consumer behaviour, which could shift job markets or alter how people interact with businesses. Additionally, as more services are tailored to individual preferences, there is a risk of increasing social isolation as people may rely more on digital interactions rather than face-to-face communication.

Ethically, the collection of personal data raises concerns about privacy and the appropriate use of information. Companies must ensure that data is collected and used transparently, with informed consent from users. Data integrity is crucial to prevent misuse or manipulation of personal information. Furthermore, inclusivity and accessibility should be prioritised to ensure that all individuals, regardless of background, are treated fairly in digital environments.

Legally, the company must comply with privacy laws, such as data protection regulations, to safeguard individuals' personal information. Failure to adhere to these laws could result in legal consequences. In addition, the company must respect copyright laws, ensuring that any data collected from third-party sources is used appropriately.

Question 25 8 marks

Criteria	Marks
Explains how bias in data collection, storage, and analysis could impact the development of the healthcare data visualisation tool and how these issues could be addressed	8
Describes bias in data collection, storage, and analysis could impact the development of the healthcare data visualisation tool and how these issues could be addressed	6-7
Shows a sound understanding of bias when developing visualisations and how to address these issues	4-5
Shows some understanding of bias when developing visualisations and/or how to address these issues	2-3
Provides some relevant information	1

Sample answer:

Data Collection Bias:

The primary source of bias in this scenario is the limited representation of rural or remote healthcare facilities in the data collection process. Since the tool focuses primarily on data from urban hospitals, it may not capture the full spectrum of patient recovery rates, especially those related to geographic, socioeconomic, and healthcare access differences. Patients in rural areas often face unique challenges such as longer travel times to healthcare facilities, limited access to specialised treatments, and fewer healthcare professionals. These factors can affect their recovery rates differently than patients in urban settings. To address this, the healthcare organisation should ensure that data is collected from a more diverse range of healthcare facilities, including rural and remote hospitals, to provide a more comprehensive and accurate view of recovery rates across all patient populations.

Data Storage Bias:

Data storage practices can also contribute to bias, especially if data is not securely stored or organised in a way that reflects the diversity of the patient population. In the case of healthcare data, ensuring that all patient information, including those from rural and urban areas, is properly categorised and protected from unauthorised access is crucial. If certain groups' data is inadvertently excluded or not properly stored, this can further skew the analysis. To address

this, secure and encrypted storage systems should be used, along with clear organisation of data to ensure that all groups are fairly represented. Additionally, the storage system should include robust metadata tagging, which helps in accurately identifying and categorising data from different populations.

Data Analysis Bias:

Bias can be introduced during data analysis if the underrepresentation of rural patient data is not corrected. Statistical methods, such as weighting the data to account for the differences in the sample sizes of urban and rural populations, can help mitigate this bias. If the data analysis does not appropriately balance these differences, the resulting visualisation may inaccurately reflect the overall recovery rates, potentially misleading healthcare providers and policymakers. Additionally, the visualisation tool itself must be designed to present data in an unbiased way, ensuring that trends from both urban and rural populations are clearly represented. This can include using appropriate data visualisation techniques, such as separate graphs for different demographics or using color-coding to highlight disparities.

Addressing the Issues:

To effectively address these biases, the healthcare organisation must ensure that the data collection process is inclusive of all patient groups, using diverse data sources to capture a full range of experiences. During data storage, stringent security measures should be put in place to protect patient privacy while maintaining data integrity. In the analysis phase, advanced statistical techniques should be used to adjust for any demographic imbalances in the data, ensuring that the final visualisations are accurate and reflective of all populations. Moreover, the tool should be regularly audited for biases to ensure that it evolves with changes in healthcare access and patient demographics.