Pampanga State Agricultural University
College of Engineering and Computer Studies
Department of Computer Studies

IAS102-Information Assurance and Security 2

Midterm Learning Activity No. 3
Introduction to System Integration and Architecture

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Course, Year & Section:	**BSIT 4-E**
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Learning Assessment – Introduction to System Integration and Architecture

Part A – Multiple Choice. Choose the best answer by writing the correct letter. (1 point each)

B 1. What is the main purpose of **system integration**?
   a. To make applications run faster
   b. To connect different systems and make them work together
   c. To replace legacy systems
   d. To prevent users from accessing multiple systems

B 2. Which type of integration ensures that all connected systems access the same, consistent, real-time data?
   a. Process Integration
   b. Data Integration
   c. API Integration
   d. Middleware

C 3. Which **security principle** states that users should only be given the minimum level of access needed to perform their job?
   a. Defense in Depth
   b. Separation of Duties
   c. Least Privilege
   d. Fail-Safe Defaults

A 4. In the **Bell-LaPadula model**, which of the following is TRUE?
   a. No Write Up, No Read Down
   b. No Read Up, No Write Down
   c. No Write Down, No Read Up
   d. Both b and c

C 5. Which of the following is an example of **Horizontal Integration**?
   a. Sensors reporting to controllers, which send data to ERP
   b. University enrollment, library, and finance systems connected via ESB
   c. A bank clerk and manager approving a transaction separately
   d. Using an ERP system to manage HR and accounting

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Part B – True or False. Write the word True if the statement is correct otherwise Failed. (1 point each)

TRUE 6. Process Integration ensures that workflows are coordinated across multiple systems.
FALSE 7. Zero Trust Architecture assumes that once you're inside a network, you can be trusted.
TRUE 8. Middleware acts as a "translator" or "glue" between different applications.
TRUE 9. In the Biba Model, the rule "No Write Up" means higher-trust users cannot modify lower-level data.
FALSE 10. Legacy systems are easy to integrate with modern cloud applications.

Part C – Essay. Discuss the following briefly. (10 points)

11. Explain the difference between **Defense in Depth** and **Fail-Safe Defaults**. Give a real-world example for each. (3pts)

Defense in Depth means using many layers of security so if one fails, others still protect the system.
Example: A university website uses a firewall, antivirus, strong passwords, and data encryption. Even if a hacker gets past the firewall, encryption keeps the data safe.

Fail-Safe Defaults means the system denies access by default and only allows what is clearly permitted.
Example: A library database blocks all new accounts until an admin approves them. This prevents accidental open access.

12. Why is **security in integration** important when connecting systems through APIs? Give one example of what could happen if it is ignored. (3pts)

When different systems connect through APIs, weak security can let attackers move from one system to another.

Example: If a student portal API has no proper authentication, hackers might use it to reach the financial system and steal tuition payment data.
Good security (like API keys, encryption, and regular testing) keeps data safe and prevents cross-system attacks.

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13. Compare **Horizontal Integration** and **Vertical Integration**. Which is more flexible in a growing university system, and why? (4pts)

Horizontal Integration connects systems on the same level, like linking the library, finance, and enrollment databases so they share student data in real time.
Vertical Integration connects systems across different levels, like connecting sensors to a controller and then to a reporting dashboard.

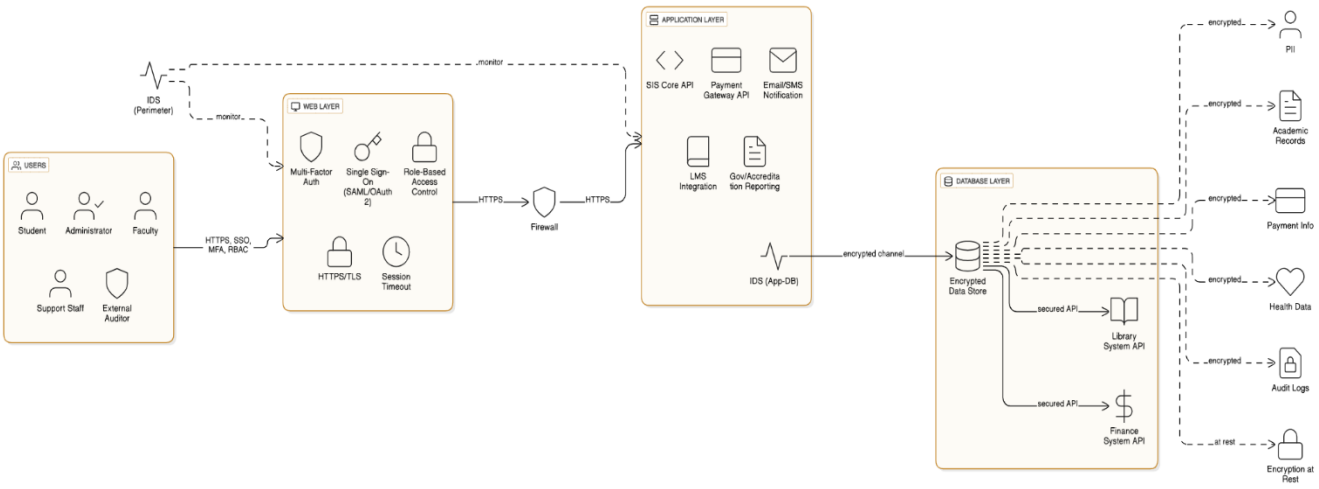
For a growing university, Horizontal Integration is more flexible because each department can add new systems (like a dormitory system) without changing the entire structure.

Part D – Case/Diagram Activity (5 points each)

14. **Case Scenario**

PSAU is building a new **Student Information System** that integrates enrollment, finance, and library systems.

- Draw a simple 3-layer diagram (Database, Application, Web).
- Show where you would apply **Defense in Depth** security measures (firewall, encryption, IDS).



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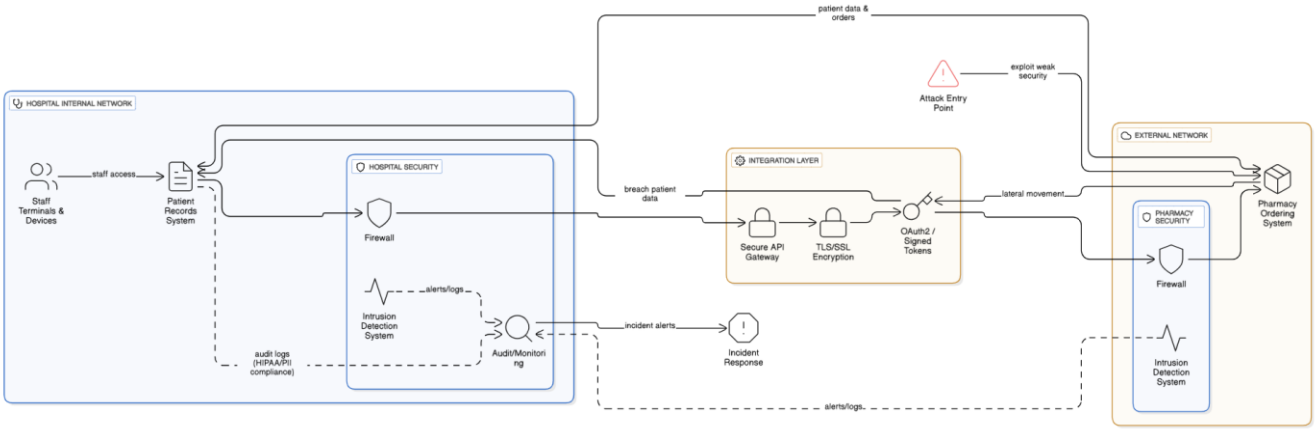
15. **Case Analysis**

A hospital integrated its patient records system with an external pharmacy ordering system. Later, hackers exploited weak security in the pharmacy system to steal patient data.

- Identify which **integration challenge** was violated.
- Suggest at least **two security measures** that could have prevented the breach.



Note: Save your work as your ***Lastname, Firstname-Section MLActNo3.***