

INF3705 – Advanced Systems Development

Assignment 01 – 2025

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Question 1

The most important difference between generic software product development and custom software development is that generic products are designed for sale to a broad market without specific user requirements, whereas custom software is developed specifically for one client with tailored requirements.

For users, this means that generic software may require them to adapt their workflows to the software's features, as it is not tailored to their unique needs. Custom software, on the other hand, is designed to fit exactly into a client's existing processes but often comes at a higher cost and longer development timeline.

Microsoft Office is the example of Generic Software

ERP is the example of custom software

Question 2

Ethical issues impacting software engineering include:

- **Privacy:** Protecting user data from unauthorized access.
- **Confidentiality:** Ensuring sensitive client or system data is safeguarded.
- **Intellectual Property:** Avoiding software piracy and respecting licensing.
- **Professional Responsibility:** Reporting risks or system faults honestly.
- **Social Impact:** Considering whether software contributes to harm or inequality.
- **Compliance:** Following legal and regulatory standards (e.g., data protection).
- **Honesty:** Accurately representing system capabilities and limitations.

Question 3

Scrum emphasizes adaptability and continuous communication, while plan-driven methods rely on detailed upfront planning and fixed roles.

Aspect	Scrum Approach	Plan-Based Approach
People Allocation	Flexible roles, cross-functional teams.	Fixed roles, specialized tasks.
Cost Estimation	Estimated per sprint; adaptable over time.	Detailed estimates upfront for the entire project.
Team Cohesion	Daily stand-ups and shared responsibility promote cohesion.	Formal tracking, less daily interaction.
Team Membership	Easier to adjust due to shared knowledge.	Harder to replace due to specialized roles.

Question 4

An engineer can keep track of relationships between functional and non-functional requirements by:

- Using a **traceability matrix** linking both types.
- Applying **requirements management tools** (e.g., Jira or Trello).
- Assigning **unique IDs** to trace related requirements. (e.g., BRS No.)
- Creating **annotated models or diagrams** showing influences.
- Regularly reviewing with stakeholders to ensure alignment.

Question 5

System architecture may need to be designed before completing requirements because:

- It helps assess **feasibility and constraints** that shape the requirements.
- Some **non-functional needs** (e.g., scalability, security) depend on architectural choices.
- Architecture provides a framework to **organize and prioritize** further requirement details.
- It allows iterative feedback between design and requirements gathering.

Question 6

Testers may not always know what a program is intended to do because:

- Requirements may be **incomplete, vague, or outdated**.
- There may be **implicit expectations** not formally recorded.
- Late changes may **misalign development and test documentation**.
- Testers may lack **deep domain knowledge** or context.

Question 7

Stress testing assesses system performance under extreme or abnormal conditions.

To stress test a Mentcare system:

- Simulate **high volumes of concurrent logins**.
- Push **large batches of patient record uploads or queries**.
- Reduce available **CPU or memory resources** artificially.
- Simulate **network interruptions or slowdowns**.
- Measure **system responses, error rates, and recovery behaviors**.

Appendix A: Plagiarism Pledge

ACADEMIC INTEGRITY DECLARATION


Declaration: Muzikayise B. Mkize

1. I understand what academic dishonesty entails and am aware of UNISA's policies in this regard.
2. I declare that this assignment is my own, original work. Where I have used someone else's work I have indicated this by using the prescribed style of referencing. Every contribution to, and quotation in, this assignment from the work or works of other people has been referenced according to this style.
3. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.
4. I did not make use of another student's work and submitted it as my own.

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Appendix B: Supporting Documents

Sommerville, I. (2016). *Software Engineering* (10th ed.). Pearson Education. Chapter 1 - 11.