Development & Evaluation — Chapter study guide

Outcome 1 — Development and Evaluation · 12 key-knowledge points · exam overview, links & practice

The big picture

Develop the solution designed in Unit 3, test and evaluate it against criteria, and assess the effectiveness of the project plan.

Unit 4 Outcome 1 is about **developing the solution, then evaluating it and the project plan**. It assumes the design from Unit 3 and focuses on building efficiently and effectively, testing thoroughly, and judging the result with evidence.

The thread: build with good practices (user-centred design, clear code, documentation, access modifiers, repositories/APIs/AI) → validate → alpha test (developer) and beta test (users) → evaluate the solution against criteria → monitor and assess the project plan.

WHAT THE EXAM REWARDS

- Efficiency vs effectiveness — define both and apply to a solution.
- Access modifiers (public/protected/private) and how private+public methods give encapsulation.
- Alpha vs beta testing — who tests and what each finds; build a testing table.
- Evaluation strategy (criteria, time frame, responsibility) and applying criteria with evidence.
- Project plans — scope creep/personnel/technical factors, recording progress, and assessing plan effectiveness by number/reasons/impact of changes.

Key knowledge at a glance

KK01	**Characteristics of efficient and effective solutions** Efficient & effective solutions: user-centred design, clear/concise code, detailed internal documentation.
KK02	**Characteristics of data types, data structures and data sources for input, storage and output** Selecting data types, structures and sources for input, storage and output.
KK03	**Features of a programming language** Programming-language features including access modifiers (public, protected, private).
KK04	**Established and innovative approaches to software development** Established & innovative approaches: code repositories, APIs/libraries, AI assistants.
KK05	**Validation techniques** Validation techniques in development: existence, type, range checking.
KK06	**Debugging and alpha testing techniques for checking solutions meet requirements and function correctly** Debugging & alpha testing: breakpoints, commenting out code, test data, testing tables.
KK07	**Strategies for conducting beta testing** Beta testing: testing plan & scenarios, observation, documenting results.
KK08	**Features of evaluation strategies** Evaluation strategies: criteria, time frame, responsibility.
KK09	**Techniques for applying evaluation criteria** Techniques for applying evaluation criteria.
KK10	**Factors that influence the effectiveness of project plans** Factors affecting project plans: scope creep, personnel changes, technical issues.

KK11	**Techniques for recording the progress of projects** Recording progress: task/time-frame adjustments, annotations, logs/journals.
KK12	**Techniques for assessing the effectiveness of a project plan** Assessing project-plan effectiveness: number of changes, reasons, impact on completion.

Must-know glossary

Effectiveness	How well a solution achieves its purpose/meets requirements.
Efficiency	How well a solution uses resources (time, cost, processing).
private	Access only within the declaring class.
Alpha testing	Internal testing by the developer.
Beta testing	Testing by real/representative users before release.
Evaluation strategy	Plan of criteria, time frame and responsibility for judging a solution.
Scope creep	Uncontrolled growth of features beyond the agreed scope.

Before the exam — revision checklist

- ■ I can distinguish efficiency and effectiveness and the traits of a good solution.
- ■ I can explain access modifiers and how they support encapsulation.
- ■ I can describe established/innovative approaches with a benefit and risk.
- ■ I can implement validation and build a testing table.
- ■ I can distinguish alpha and beta testing and describe beta strategies.
- ■ I can state the features of an evaluation strategy and apply criteria with evidence.
- ■ I can explain the factors affecting project plans and how to record progress.
- ■ I can assess a project plan’s effectiveness by number, reasons and impact of changes.

Exam practice — questions & model answers

Q1. A finished booking solution is to be evaluated. State the three features of an evaluation strategy and one evidence source you would use.

State · 4 marks

Model answer

• Criteria (1).
• Time frame (1).
• Responsibility (1).
• Evidence source: user feedback/surveys, observation or performance data (1).

Q2. During development, the client keeps requesting extra features. Name this factor and explain its impact and one way to control it.

Name/Explain · 3 marks

Model answer

• Scope creep (1).
• It adds work beyond the agreed scope, delaying completion and increasing cost (1).
• Control it with a clear agreed scope and a formal change-request process (1).

Q3. Distinguish between alpha and beta testing and give one benefit of each.

Distinguish · 4 marks

Model answer

• Alpha = internal testing by the developer (1); benefit: finds code defects early (1).

• Beta = testing by real users before release (1); benefit: exposes real-world usability issues (1).