# VCE Software Development School-assessed Task 2024

## Video 2
## Unit 3 Outcome 2
## SAT Criteria 1–5

# Acknowledgement of Country

The VCAA respectfully acknowledges the Traditional Owners of Country throughout Victoria and pays respect to the ongoing living cultures of First Peoples.

# VCE Software Development School-assessed Task 2024

## Video 2
## Unit 3 Outcome 2
## SAT Criteria 1–5

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VCAA

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# Outline of presentation

- Nature of task
- SAT Criteria 1–5
- Authentication
- Assessment
- Issues identified after marking Unit 3 Outcome 2

# Nature of task

# Unit 3 Outcome 2

Analyse and document a need or opportunity, justify the use of an appropriate development model, formulate a project plan, generate alternative design ideas and represent the preferred solution design for creating a software solution.

# Nature of task

A project plan (Gantt chart) indicating tasks, times, milestones, dependencies and critical path

**And**

A justification of the selected development model as a written report

**And**

An analysis that defines the requirements, constraints and scope of a solution in the form of a software requirements specification

**And**

A folio of alternative design ideas and detailed design specifications of the preferred design.

# Unpacking the criteria
# Criteria 1–5

# Scope of task

# Identification of need or opportunity

In preparation for the SAT students will need to be able to identify a real-world need or opportunity that can be developed as a software solution for a client.

Teachers should have discussions with their students regarding their need or opportunity and to have a process for approving the need or opportunity before students commence their project plan. Students are encouraged to document their ideas in order to convince their teacher that they will be able to develop a software solution.

The evidence of this task is observed through Observation 1.

# An approach for identifying a need or opportunity

Considerations:

- How do you want students to identify their need or opportunity? Some schools do this formally. How should they document this? Are you convinced they can actually develop the software solution and meet the criteria? How will you support struggling students?

- How much time will students need to do this? Get them thinking early in Term 1.

- What programming languages will they use? Refer to the **Programming requirements** document on the study page.

# Preparation of a project plan

Criterion 1 assesses students' skills in project management. Students will prepare a Gantt chart using software that documents all the stages and the activities of the problem-solving methodology for Unit 3 Outcome 2 and Unit 4 Outcome 1 (both parts of the SAT).

Students will need to document all the relevant tasks, sequencing, time allocations, milestones, dependencies and critical path.

The evidence from this task is observed through Observation 2 and assessed through Criterion 1.

# Criterion 1

| VCE Software Development: School-assessed Task 2024 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Criteria** | **Levels of Performance** | | | | | | |
| | **Indicators** | **Not shown** | **1–2 (very low)** | **3–4 (low)** | **5–6 (medium)** | **7–8 (high)** | **9–10 (very high)** |
| **Unit 3 Outcome 2**<br><br>**1. Skills in project management.** | • Prepares a Gantt chart using software that documents all stages and activities of the problem-solving methodology for U3 O2 and U4 O1.<br><br>• Documents all the relevant tasks, sequencing, time allocations, milestones, dependencies and critical path. | Insufficient evidence | Prepares a plan using software that documents some of the stages and/or activities of the problem-solving methodology.<br><br>Identifies a limited number of relevant tasks, sequencing and time allocations. | Prepares a plan or Gantt chart using software that documents most stages and some activities of the problem-solving methodology for U3 O2 and U4 O1.<br><br>Identifies some relevant tasks, sequencing and time allocations. | Prepares a Gantt chart using software that documents all the stages and some activities of the problem-solving methodology for U3 O2 and U4 O1.<br><br>Documents a range of relevant tasks, sequencing, time allocations, milestones and dependencies. | Prepares a Gantt chart using software that documents in detail all the stages and most of the activities of the problem-solving methodology for U3 O2 and U4 O1.<br><br>Documents in detail most of the relevant tasks, sequencing, time allocations, milestones, dependencies and the critical path for the project. | Prepares a Gantt chart using software that comprehensively documents all the stages and activities of the problem-solving methodology for U3 O2 and U4 O1.<br><br>Documents comprehensively all relevant tasks, sequencing, time allocations, milestones, dependencies and the critical path for the project. |
| | | 0 ☐ | 1 ☐     2 ☐ | 3 ☐     4 ☐ | 5 ☐     6 ☐ | 7 ☐     8 ☐ | 9 ☐     10 ☐ |

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# An approach for preparing a project plan

Students will produce a project plan (Gantt chart) that outlines the tasks, sequencing, time allocation, dependencies, milestones and the critical path.

They will follow the project plan to develop their software solution to their identified need or opportunity.

The project plan takes into consideration all stages and activities of the problem-solving methodology covered in Unit 3 Outcome 2 and Unit 4 Outcome 1.

Once the project plan has been developed it will be monitored and modified throughout the entire project.

Students do not have to use dedicated project-management software in the development of their project plan.

From the *Advice for teachers*

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# Development model

Criterion 2 assesses students' skills in the selection and justification of a development model. Students are to document and justify the use of their selected development model approach for developing their software solution. Diagrams representing each of the development models are in the *Advice for teachers*.

The evidence from this task is observed through Observation 3 and assessed through Criterion 2.

# Criterion 2

| VCE Software Development: School-assessed Task 2024 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Criteria** | **Levels of Performance** | | | | | | |
| | Indicators | Not shown | 1–2 (very low) | 3–4 (low) | 5–6 (medium) | 7–8 (high) | 9–10 (very high) |
| **Unit 3 Outcome 2**<br><br>**2. Skills in the selection and justification of a development model.** | • Documents the use of the selected development model approach.<br><br>• Documents the justification of the selected development model approach. | Insufficient evidence | Lists some features of the selected development model.<br><br>Identifies limited justification for the use of the selected development model approach. | Outlines some features of the selected development model.<br><br>Outlines a brief justification for the use of the selected development model approach. | Documents a range of features of the selected development model.<br><br>Documents a sound justification for the use of the selected development model approach. | Documents in detail most of the features of the selected development model.<br><br>Documents a detailed justification for the use of the selected development model approach. | Documents comprehensively all the features of the selected development model.<br><br>Documents a comprehensive justification for the use of the selected development model approach. |
| | | 0 ❑ | 1 ❑          2 ❑ | 3 ❑          4 ❑ | 5 ❑          6 ❑ | 7 ❑          8 ❑ | 9 ❑          10 ❑ |

# An approach for selecting and justifying the use of a development model

Students need to select and justify the use of a development model that best suits the context of their need or opportunity.

Will it be:

- waterfall
- spiral
- agile
- or will it be a hybrid such as waterfall and agile?
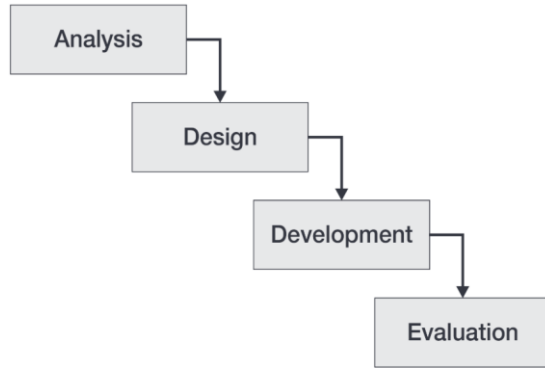
# Development models
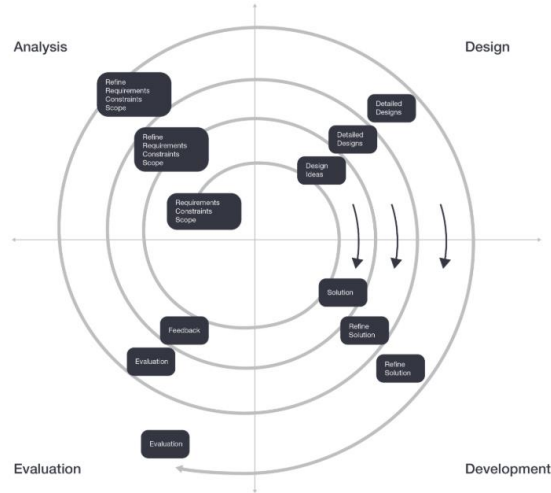


Figure 4: Sample waterfall model using the PSM



Figure 5: Sample spiral model using the PSM



Figure 6: Sample agile model using the PSM

From the *Advice for teachers*

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# Development models compared

**Waterfall**
- Good for small projects
- Requirements are clearly stated at the beginning of the project and don't change
- Software produced late
- Linear process from start to finish
- Each stage is completed one at a time
- Clients only interact at beginning and end of the project

**Spiral**
- Combination of Waterfall and Agile
- Good for large projects
- Good for when requirements are not clear
- Better client feedback
- Software produced early
- Each stage starts small and builds up throughout the project in each spiral
- Design and then get client feedback, develop and then add functionality, etc

**Agile**
- Good for client satisfaction
- An iterative process – software is not developed all at once
- Delivered in stages for client feedback
- Requires a lot of face-to-face communication
- Software produced early
- Tasks are performed quickly
- Changes to requirements and feedback from clients can be incorporated throughout the project

# Collection of data

Students are required to document data for analysis using appropriate data collection methods. The data collected will contribute to the use of analytical tools and techniques in Criterion 3 and the development of a software requirements specification in Criterion 4. The process of data collection may involve students communicating back-and-forth with their clients.

Students will document evidence of their critical and creative thinking through the identification, clarification and critical analysis of the data collected as part of the Analysis Stage in Criterion 3. Refer to the Skills underpinning the Analysis Stage in the Units 1 to 4: Problem-solving methodology specifications on page 13 of the study design.

The evidence from this task is observed through Observation 4 and assessed as part of Criterion 3.

# Criterion 3

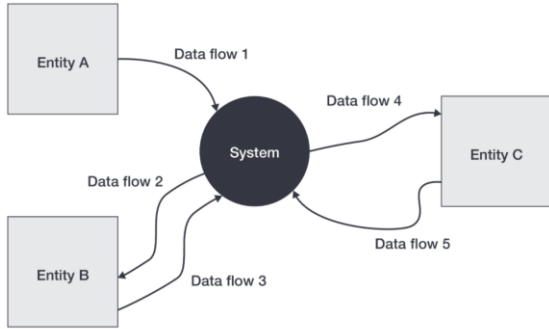| | | | | VCE Software Development: School-assessed Task 2024 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Assessment Criteria** | | **Levels of Performance** | | | | | | |
| | **Indicators** | **Not shown** | **1–2 (very low)** | **3–4 (low)** | **5–6 (medium)** | **7–8 (high)** | **9–10 (very high)** |
| **Unit 3 Outcome 2**<br><br>**3. Skills in using analytical tools and techniques.** | • Documents data for analysis using appropriate data collection methods. | Insufficient evidence | Identifies limited relevant data for analysis using one data collection method. | Outlines some relevant data for analysis using some data collection methods and techniques. | Documents a range of relevant data for analysis using a range of appropriate data collection methods and techniques. | Documents in detail a wide range of relevant data for analysis using a range of appropriate data collection methods and techniques. | Documents a comprehensive set of relevant data for analysis using a wide range of appropriate data collection methods and techniques. |
| | • Uses all the appropriate features of the selected analytical tools. | | Uses limited features of the selected analytical tools. | Uses some of the features of the selected analytical tools. | Uses accurately a range of the features of the selected analytical tools. | Uses accurately most of the features of the selected analytical tools. | Uses accurately all the features of the selected analytical tools. |
| | • Depicts all the relationships between data, users and digital systems. | | Depicts limited relationships between the data, users and digital systems in the analytical tools used. | Depicts some of the relationships between the data, users and digital systems in the analytical tools used. | Depicts a range of the relationships between the data, users and digital systems in the analytical tools used. | Depicts most of the relationships between the data, users and digital systems in all analytical tools used. | Depicts accurately all the relationships between the data, users and digital systems in all analytical tools used. |
| | • Documents evidence of critical and creative thinking through the identification, clarification and critical analysis of the data collected. | | Lists some evidence of critical and creative thinking through the identification of the data collected. | Outlines some evidence of critical and creative thinking through the identification and analysis of the data collected. | Documents evidence of critical and creative thinking through the identification, clarification and analysis of the data collected. | Documents detailed evidence of critical and creative thinking through the identification, clarification and critical analysis of the data collected. | Documents comprehensively evidence of critical and creative thinking through the identification, clarification and critical analysis of the data collected to determine its reliability. |
| | | 0 ☐ | 1 ☐　　2 ☐ | 3 ☐　　4 ☐ | 5 ☐　　6 ☐ | 7 ☐　　8 ☐ | 9 ☐　　10 ☐ |

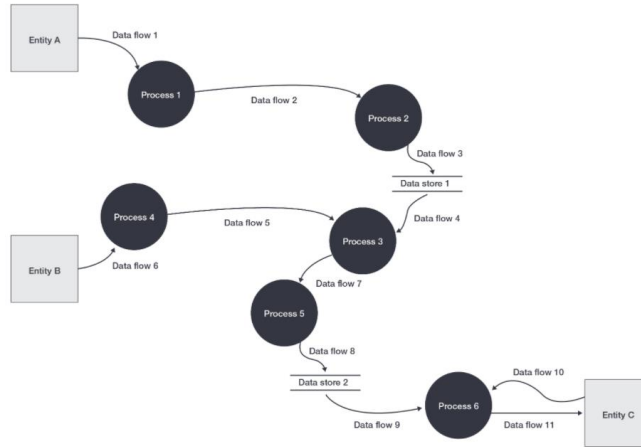# Analytical tools



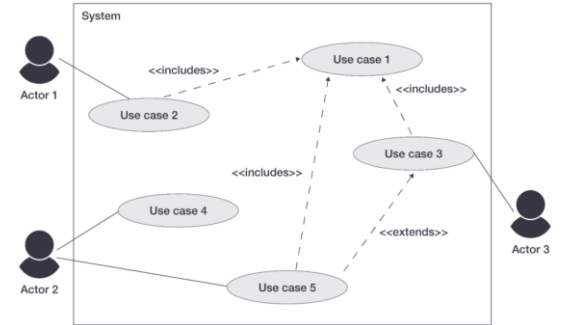Figure 7: Sample context diagram

Figure 8: Sample data flow diagram
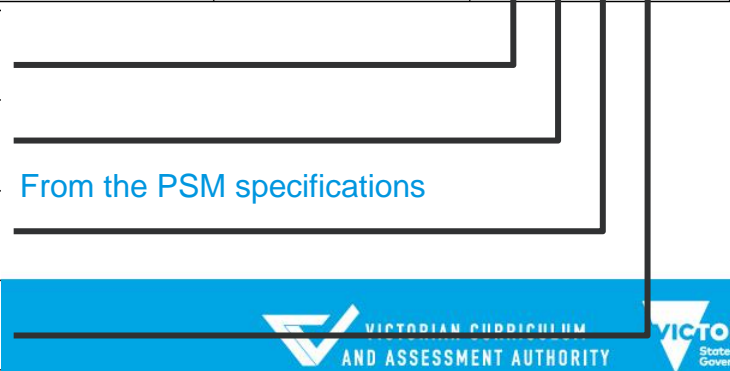
Figure 9: Sample use case diagram

From the *Advice for teachers*

# An approach to documenting critical and creative thinking

From Criterion 3

| | | Lists some evidence of critical and creative thinking through the identification of the data collected. | Outlines some evidence of critical and creative thinking through the identification and analysis of the data collected. | Documents evidence of critical and creative thinking through the identification, clarification and analysis of the data collected. | Documents detailed evidence of critical and creative thinking through the identification, clarification and critical analysis of the data collected. | Documents comprehensively evidence of critical and creative thinking through the identification, clarification and critical analysis of the data collected to determine its reliability. |
|---|---|---|---|---|---|---|
| • Documents evidence of critical and creative thinking through the identification, clarification and critical analysis of the data collected. | 0 ❑ | 1 ❑   2 ❑ | 3 ❑   4 ❑ | 5 ❑   6 ❑ | 7 ❑   8 ❑ | 9 ❑   10 ❑ |

| Skills underpinning the Analysis Stage | Identify and clarify the data and information that needs to be collected and from what sources it will be collected. |
| | Critically analyse the sources of data and information to determine the reliability of it. |
| | Draft and evaluate questions to critically analyse requirements, needs or opportunities. |
| | Develop strategies for asking follow-up questions to further clarify the data and information collected. |

From the PSM specifications

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# Development of a software requirements specification

Criterion 3 assesses students' skills in the use of analytical tools and techniques. Students will document the appropriate features of the selected analytical tools and depict the relationships between the data, users and digital systems. Sample representations of the analytical tools are in the *Advice for teachers*.

Criterion 4 assesses students' skills in documenting a software requirements specification. Students will document the functional and non-functional requirements, constraints and scope as well as the technical environment and the intended audience of the software solution. An outline of the content required in the software requirements specification is in the *Advice for teachers*.

Students will document evidence of their critical and creative thinking through the identification, clarification and critical analysis of the data collected as part of the Analysis Stage in Criterion 3 and 4. Refer to the Skills underpinning the Analysis Stage in the Units 1 to 4: Problem-solving methodology specifications on page 13 of the study design.

The evidence from this task is observed through Observation 5 and assessed through Criterion 3 and 4.

# Criterion 4

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|---|---|---|---|---|---|---|---|
| **Assessment Criteria** | **Levels of Performance** | | | | | | |
| | **Indicators** | **Not shown** | **1–2 (very low)** | **3–4 (low)** | **5–6 (medium)** | **7–8 (high)** | **9–10 (very high)** |
| **Unit 3 Outcome 2**<br><br>**4. Skills in documenting a software requirements specification.** | • Documents the functional and non-functional requirements, constraints and scope as part of the SRS.<br><br>• Documents the technical environment and the intended audience of the solution as part of the SRS.<br><br>• Documents evidence of critical and creative thinking through the use of questions and strategies to critically analyse solution requirements. | Insufficient evidence | Lists a limited set of solution requirements.<br><br>Lists some details of the technical environment of the solution or the intended audience.<br><br>Lists some evidence of critical and creative thinking through the use of questions to identify solution requirements. | Outlines some appropriate functional requirements and scope.<br><br>Outlines some aspects of the technical environment and the intended audience of the solution.<br><br>Outlines some evidence of critical and creative thinking through the use of questions to analyse solution requirements. | Documents an appropriate range of functional requirements, constraints and scope.<br><br>Documents the technical environment and the intended audience of the solution.<br><br>Documents evidence of critical and creative thinking through the use of questions and strategies to analyse solution requirements. | Documents detailed functional and non-functional requirements, constraints and scope.<br><br>Documents in detail the technical environment and the intended audience of the solution.<br><br>Documents detailed evidence of critical and creative thinking through the use of questions and strategies to critically analyse solution requirements. | Documents comprehensively all functional and non-functional requirements, constraints and scope.<br><br>Documents comprehensively the technical environment and the intended audience of the solution.<br><br>Documents comprehensively evidence of critical and creative thinking through the use of effective questions and strategies to critically analyse solution requirements. |
| | | 0 ☐ | 1 ☐     2 ☐ | 3 ☐     4 ☐ | 5 ☐     6 ☐ | 7 ☐     8 ☐ | 9 ☐     10 ☐ |

# An approach to developing the software requirements specification

The presentation of the SRS should include the following content:

- the purpose and audience of the SRS
- user characteristics (general characteristics of the proposed users for the software solution)
- environmental characteristics (technical description of the environment in which the software solution will operate)
- functional requirements and non-functional requirements
- constraints
- scope
- appendices
  - context diagrams
  - data flow diagrams
  - use case diagrams

From the *Advice for teachers*

# Design folio

Criterion 5 assesses students' skills in designing the software solution. Students will generate two or three alternative design ideas, develop evaluation criteria with reference to their design ideas and the efficiency and effectiveness of the software solution and then produce their preferred designs for the software solution. An example of the process for developing detailed designs is in the *Advice for teachers*.
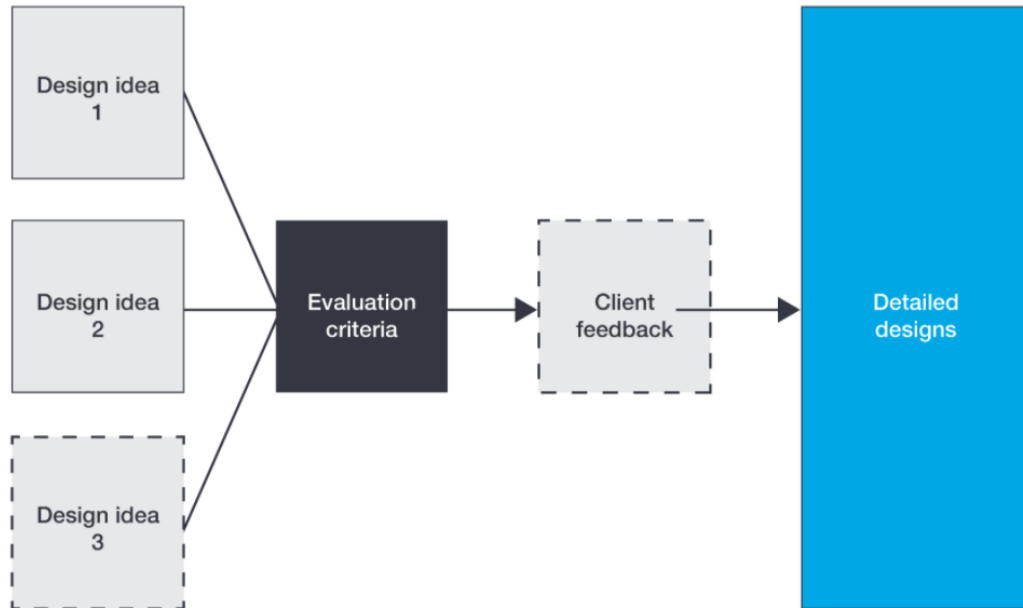
Students will document evidence of their critical and creative thinking through design ideas, solution requirements and justification of preferred designs as part of the Design Stage in Criterion 5. Refer to the Skills underpinning the Solution design activity in the Units 1 to 4: Problem-solving methodology specifications on page 14 of the study design.

The evidence from this task is observed through Observation 6 and assessed through Criterion 5.

# Criterion 5

| | | Levels of Performance | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Criteria** | **Indicators** | **Not shown** | **1–2 (very low)** | **3–4 (low)** | **5–6 (medium)** | **7–8 (high)** | **9–10 (very high)** |
| **Unit 3 Outcome 2**<br><br>**5. Skills in designing the software solution.** | • Generates alternative design ideas. | Insufficient evidence | Generates two design ideas with limited differences in appearance or functionality. | Generates two design ideas with some modifications in appearance and functionality. | Generates two or three design ideas that represent sound alternatives to appearance and functionality. | Generates two or three design ideas that are feasible alternatives and clearly differ in appearance and functionality. | Generates two or three distinctive design ideas that are feasible and original representations of appearance and functionality. |
| | • Develops evaluation criteria with reference to design ideas and the efficiency and effectiveness of the software solution. | | Lists some criteria for evaluating design ideas and some aspects of the software solution. | Outlines some criteria for evaluating design ideas and the efficiency and effectiveness of the software solution. | Develops a range of criteria for evaluating alternative design ideas and the efficiency and effectiveness of the software solution. | Develops a detailed set of criteria for evaluating alternative design ideas and the efficiency and effectiveness of the software solution. | Develops a comprehensive set of criteria for evaluating alternative design ideas and the efficiency and effectiveness of the software solution. |
| | • Produces preferred design for the software solution. | | Produces the preferred design using limited and incomplete methods. | Produces and justifies the preferred design using some appropriate methods and limited reference to the evaluation criteria. | Produces and justifies the preferred design using a range of appropriate methods and design factors with reference to some evaluation criteria. | Produces and justifies the preferred design in detail using appropriate methods and design factors with detailed reference to most evaluation criteria. | Produces and justifies the preferred design comprehensively using appropriate methods and design factors with detailed reference to all evaluation criteria. |
| | • Documents evidence of critical and creative thinking through design ideas, solution requirements and justification of preferred designs. | | Lists some evidence of critical and creative thinking through the development of connections between ideas and solution requirements. | Outlines some evidence of critical and creative thinking through the development of connections between design ideas and solution requirements. | Documents evidence of critical and creative thinking through the development of connections between design ideas and solution requirements and the justification of the preferred designs. | Documents detailed evidence of critical and creative thinking through the connection of ideas, design ideas and solution requirements and the justification of the preferred designs. | Documents comprehensively evidence of critical and creative thinking through the connection of ideas, the generation of design ideas and solution requirements and the justification of preferred designs. |
| | | 0 ❑ | 1 ❑        2 ❑ | 3 ❑        4 ❑ | 5 ❑        6 ❑ | 7 ❑        8 ❑ | 9 ❑        10 ❑ |

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# An approach to designing the software solution

# Authentication

# Authentication

## Authentication record form: VCE Applied Computing: Unit 3 Software Development SAT 2024

This form must be completed by the class teacher. It provides a record of the monitoring of the student's work in progress for authentication purposes. This form is to be retained by the school and filed. It may be collected by the VCAA as part of the School-based Assessment Audit.

Student name ……………………………………………………………  Student No ☐☐☐☐☐☐☐☐☐

School ……………………………………………………………………  Teacher: ………………………………………………………………………………

| Component of School-assessed Task | Date observed and submitted | Teacher comments | Teacher's initials | Student's initials |
|---|---|---|---|---|
| Observation 1: Identification of need or opportunity<br>The student has identified/has documented a real-world need or opportunity that can be solved as a software solution. The teacher has approved or not approved the need or opportunity. | Observed | Observation of need or opportunity | | |
| | Submitted | Submission of need or opportunity | | |
| Observation 2: Preparation of a project plan<br>(Criterion 1)<br>The student is preparing/has prepared a Gantt chart for both parts of the SAT (Unit 3 Outcome 2 and Unit 4 Outcome 1). | Observed | Observation of the development of the project plan | | |
| | Submitted | Submission of project plan | | |
| Observation 3: Development model<br>(Criterion 2)<br>The student has selected and is documenting/has documented the use of an appropriate development model. | Observed | Observation of the documenting of the development model | | |
| | Submitted | Submission of the development model | | |
| Observation 4: Collection of data<br>(Criterion 3)<br>The student has identified appropriate data and data collection methods for analysis and development of the software requirements specification. | Observed | Observation of the collected data | | |
| | Submitted | Submission of collected data | | |
| Observation 5: Development of a software requirements specification<br>(part of Criterion 3; Criterion 4)<br>The student is documenting/has documented the analysis in the form of a software requirements specification with the inclusion of analytical tools. | Observed | Observation of the development of the software requirements specification | | |
| | Submitted | Submission of the software requirements specification | | |
| Observation 6: Design folio<br>(Criterion 5)<br>The student is developing/has developed a folio of design ideas, evaluation criteria and their preferred detailed design. | Observed | Observation of the development of designs | | |
| | Submitted | Submission of design folio | | |

I declare that all resource materials and assistance used have been acknowledged and that all unacknowledged work is my own.

Student signature ………………………………………………………………… Date …………………………………

# Assessment

# Assessment

## 2024 Victorian Certificate of Education
## Applied Computing: Software Development Assessment Sheet
## School-assessed Task

STUDENT NAME

This assessment sheet will assist teachers to determine their score for each student. Teachers need to make judgments on the student's performance for each criterion. Teachers will be required to choose one number from 0–10 to indicate how the student performed on each criterion with comments, as appropriate. Teachers then add the subtotals to determine the total score.

STUDENT NUMBER

ASSESSING SCHOOL NUMBER

| Criteria for the award of grades<br>The extent to which the student demonstrates: | Not Shown (0) | Very Low (1–2) | Low (3–4) | Med (5–6) | High (7–8) | Very High (9–10) |
|---|---|---|---|---|---|---|
| 1   skills in project management | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2   skills in the selection and justification of a development model | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3   skills in using analytical tools and techniques | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4   skills in documenting a software requirements specification | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5   skills in designing the software solution | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6   skills in using a programming language to develop the software solution | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7   skills in managing data and files, and testing the software solution | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8   skills in conducting usability testing | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9   skills in evaluating the software solution | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10  skills in assessing the project plan. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Performance on Criteria: Teacher's Comments**
You may wish to comment on aspects of the student's work that led to your assessment.

If a student does not submit the School-assessed Task at all, N/A should be entered in the total score box.

SUBTOTALS   ☐ ☐ ☐ ☐ ☐ ☐

TOTAL SCORE

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# Issues identified after marking Unit 3 Outcome 2

At the completion of Unit 3 Outcome 2 students may experience issues that will have a negative effect on the development of their software solution in Unit 4 Outcome 1.

Teachers can provide feedback on the quality of the designs, however, the adjustments must be initiated by the student and not directed by the teacher.

While students can make changes to their designs they will not be reassessed and their original score will stand.

# Contact

- **Phil Feain – Digital Technologies Curriculum Manager (VCAA)**

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- **Philip.Feain@education.vic.gov.au**

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