Digital Solutions

Unit 2 – Application and data solutions

January 2019

Citipointe Christian College

FIA3 – Project 30%

Assessment objectives

This assessment instrument is used to determine student achievement in the following objectives:

1. recognise and describe programming elements, data and useability principles, and data management processes

2. symbolise and explain information, ideas and data flow relationships within and between systems related to programming problems

3. analyse problems and information related to the selected technology context

4. determine solution requirements and prescribed and self-determined criteria of a programming problem

5. synthesise information and ideas to determine possible digital solutions

6. generate user interface and programmed components of the prototype digital solution

7. evaluate impacts, components and solutions against criteria to make refinements and justified recommendations

8. make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts.

	Citipointe Christian College	
	Student name:	**Student number:**
	Teacher name:	
	Date handed out:	**Date due:** Friday T3 W6 30/8/2019

Subject	Digital Solutions	**Instrument no.**	FIA3
Technique	Project		
Unit	2: Application and data solutions		
Topic	Topic 1: Data-driven problems and solution requirements Topic 2: Data and programming techniques Topic 3: Prototype data solutions		

Conditions			
Duration	12 weeks		
Mode	Multimodal	**Length**	• 8-10 A3 pages of documenting problem-solving process • 2-4 minute demonstration of the functionality of the user interface and coded components of the digital solution by video recording • 4-6 A4 pages of code with annotations
Individual/ group	Individual/Group	**Other**	• The reference list is not included in the presentation time • Schools implement authentication strategies that reflect QCAA guidelines

Resources available	Computers, internet and software including, but not limited to:
	• XAMPP stack
	• Dreamweaver
	• Samples provided by the teacher:
	   o database structure
	   o student database
	   o preliminary database tables.		

Context			

Citipointe Christian College has a program called G21, where older students (mentors) tutor younger students (mentees) in subjects. Mentees need to be able to find and book a session with a mentor, currently this is a manual process and isn't working effectively. A solution is required and Citipointe would like an interactive web application created to help run G21. All students have an iPad and/or a laptop, therefore you would need to make it accessible to a range of devices and browsers.

Task	
G21 INFO	You are to document use of the problem-solving process in responding to the problem. You will explore, develop, generate and evaluate a prototype interactive web application to assist students to find and book a tutoring session with a mentor. The technical specifications (stimulus) provides detailed information about the requirements for the prototype interactive web application. You must document your process and demonstrate the functionality of the informational prototype website in a video recording.

To complete this task, you must:

- recognise and describe
  - programmed and user-interface components
  - usability principles including, accessibility, effectiveness, safety, utility and learnability.
- symbolise
  - the user and developer problem using mind maps and one or more constructed sketches, annotated diagrams, images or screenshots
  - algorithms communicated in pseudocode that demonstrated knowledge and understanding of programming features
  - interrelationships between user experiences and data in the prototype interactive web application.
- explain
  - internal and external data components and data structures using appropriate symbols, code, data samples and screenshots from the prototype interactive web application with annotations
  - the prototype interactive web application from a user-experience perspective communicated by way of a collection of annotated images of the user-interface components
  - how programming elements and user-interface components connect, communicating it through an annotated diagram
  - the functionality, useability and efficiency of the coded components communicated through code comments and annotations on the 4–6 A4 pages
- analyse the prototype interactive web application and information to identify
  - data inputs
  - data and programmed components and their relationships to the structure of the prototype interactive web application
  - the prototype interactive web application's potential personal, social and economic impacts
- determine
  - solution requirements that include
    - essential elements and features of the user interface based on useability principles
    - data structures and linkage to interface and code
  - prescribed and self-determined criteria
- synthesise ideas and information about solutions for
  - user interfaces
  - data and programmed components of the prototype interactive web application, for example annotated diagrams identifying and describing proposed components of the prototype web application
  - data repositories
  - programming to generate a prototype interactive web application
- generate
  - sample code for the digital prototype website on the 4-6 A4 pages, demonstrating:
    - selection
    - iteration
    - user input
    - data output
  - a prototype interactive web application by combining the user interface, data and coded components
- evaluate against criteria the
  - personal, social and economic impacts supported by a collection of data samples or representations
  - accuracy and efficiency of the coded components supported by a collection of annotated code segments in tables, diagrams and written paragraphs identifying errors and actions
  - the prototype interactive web application from a user-experience perspective supported by a collection of annotated images of the provided user-interface components
- make refinements and justified recommendations for current and future improvements.

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Stimulus
See Technical specifications

Checkpoints
☐   Term 2 Week 10 – Friday 7/6/2019: Review #1
☐   Term 3 Week 4 – Friday 16/8/2019: Review #2
☐   Term 3 Week 6 – Friday 30/8/2019: Final submission

Criterion	Marks allocated	Result
Retrieving and comprehending Assessment objectives 1, 2	8	
Analysing Assessment objectives 3, 4	8	
Synthesising and evaluating Assessment objectives 5, 6, 7	10	
Communicating Assessment objective 8	4	
Total	30	

Feedback

Authentication strategies
• You will be provided class time for task completion.
• You will each produce a unique response by identifying which aspects are group work and which aspects are individual work.
• You will provide documentation of your progress at indicated checkpoints.
• Your teacher will conduct interviews or consultations as you develop the response.
• Plagiarism-detection software will be used when you submit your response.
• You must acknowledge all sources.
• You must submit a declaration of authenticity.
• Your teacher will ensure class cross-marking occurs.

Scaffolding

Your response must include:
    • headings that organise and communicate the iterative phases of the problem-solving process in Digital Solutions
    • A3 pages that
        – demonstrate all phases of the problem-solving process
        – communicate knowledge and understanding by way of annotated sketches, diagrams, images or screenshots

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- a video
  - in mp4 file format
  - no larger than 200 MB
  - demonstrating the functionality of the prototype interactive learning object's user interface and coded components
- A4 pages of code with annotations of analysis, synthesis and evaluation related to the code element or problem
- referencing of sources, using the school's referencing style
- written and visual features, as well as grammatically accurate language conventions, to communicate decision-making

Note
- After the first checkpoint, you will be provided with the following samples
  - database structure
  - student database
  - preliminary database tables.
- You may work in a team of up to three to collaboratively develop the solution, however each person is individually responsible for defining and documenting
  - pages for mentees requesting help, the mentors providing help and the teacher or tutor
  - a solution, including the required database structure and the contributing coded solution for either the mentee requesting help, the mentor providing help or the teacher or tutor.
- You may use the website, GitHub for code sharing and combining your individual components into a whole. You must include your teacher in your GitHub repository.

Technical specifications:

The prototype interactive web application must allow
- users to be able to register for a subject as either a mentor or mentee
- mentees to be able to
  - find mentors in their house
  - request help for a subject that they currently study and be able to book a session with the mentor in the peer-support lesson (Thursday or Friday, period 6)
  - provide feedback on the mentor who supported them. You may consider other reports that should be generated
- mentors to be able to
  - update their availability
  - generate a report that displays the sessions for the week and a list of students that have been assigned to them and what subjects they need help with.
- teachers to be able to
  - see all the tutoring sessions provided by mentors and the sessions booked by mentees
  - generate a report that displays the number of times sessions are booked for each subject/year level combination
  - print a list of the students in their Tutor group and examine each student's activity
- data to be accessible only to students and teachers at the school and it should work on all modern browsers, regardless of view port size

Instrument-specific marking guide

Criterion: Retrieving and comprehending

Assessment objectives

1. recognise and describe programming elements, data and useability principles, and data management processes

2. symbolise and explain information, ideas and data flow relationships within and between systems related to programming problems

The student work has the following characteristics:	Marks
• accurate and discriminating recognition and discerning description of programming elements, data, user-interface components and useability principles, and data management processes. • adept symbolisation and discerning explanation of information, ideas and data flow relationships within and between systems related to programming problems	7-8
• accurate recognition and effective description of programming elements, data, user-interface components and useability principles, and data management processes. • methodical symbolisation and effective explanation of information, ideas and data flow relationships within and between systems related to programming problems	5-6
• appropriate recognition and description of programming elements, data, user-interface components and useability principles, and data management processes. • competent symbolisation and explanation of information, ideas and data flow relationships within and between systems related to programming problems	3-4
• variable recognition and superficial description about elements and features of programming, data, user interface or useability principles • variable symbolisation and superficial explanation of information, ideas and data flow relationships	1-2
• does not satisfy any of the descriptors above.	0

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Criterion: Analysing

3. analyse problems and information related to the selected technology context

4. determine solution requirements and prescribed and self-determined criteria of a programming problem

The student work has the following characteristics:	Marks
• insightful analysis of the problem and relevant contextual information to identify the relevant elements and features of user interface, data and programming components and their relationships to the structure of the identified problem • astute determination of user interface, data, programmed and solution requirements of the identified problem and essential prescribed and self-determined criteria.	7-8
• considered analysis of the problem and relevant contextual information to identify the relevant elements and features of user interface, data and programmed components and their relationships to the structure of the low-fidelity prototype digital solution • logical determination of the user interface, data, programmed and solution requirements of the digital solution and effective prescribed and self-determined criteria.	5-6
• appropriate analysis of the problem and contextual information to identify some elements and features of user interface, data and programming components and their relationships to the structure of the identified problem • reasonable determination of user interface, data, programmed and solution requirements of the identified problem and some prescribed and self-determined criteria.	3-4
• superficial analysis of the problem or aspects of information to identify some elements or features of user interface or programming components or their relationships to the structure of the identified problem • vague determination of some programming or user-experience requirements of the identified problem or prescribed criteria.	1-2
• does not satisfy any of the descriptors above.	0

Criterion: Synthesising and evaluating

Assessment objectives

5. synthesise information and ideas to determine possible digital solutions

6. generate user interface and programmed components of the prototype digital solution

7. evaluate impacts, components and solutions against criteria to make refinements and justified recommendations

The student work has the following characteristics:	Marks
• coherent and logical synthesis of relevant information and ideas to determine data elements, user interface and programmed components for a digital solution • purposeful generation of efficient user interface and programmed components of the digital solution • critical evaluation of impacts, user experience and coded components and the digital solution against essential prescribed and self-determined criteria to make discerning refinements and astute recommendations justified by data.	9-10
• logical synthesis of relevant information and ideas to determine data elements, user interface and programmed components for a digital solution • effective generation of user interface and programmed components of the digital solution • reasoned evaluation of impacts, user experience and coded components and the digital solution against effective prescribed and self-determined criteria to make effective refinements and considered recommendations justified by data.	7-8
• simple synthesis of information and ideas to determine data elements, user interface and programmed components for a digital solution • adequate generation of user interface and programmed components of the digital solution • feasible evaluation of impacts, user experience and coded components and the digital solution against some prescribed and self-determined criteria to make adequate refinements and fundamental recommendations justified by data.	5–6
• rudimentary synthesis of partial information or ideas to determine data elements, user interface or programmed components • partial generation of user interface and programmed components of the digital solution • superficial evaluation of impacts, user experience components or the solution against some criteria.	3–4
• unclear combination of information, ideas or solution components • identification of a change to an idea or a solution.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Communicating

Assessment objectives

8. make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts.

The student work has the following characteristics:	Marks
• discerning decision-making about, and fluent use of – written, visual and/or spoken features to communicate about a solution – language for a technical audience – grammatically accurate language structures – referencing and investigation conventions.	3–4
• variable decision-making about, and inconsistent use of – written, visual and/or spoken features – suitable language – grammar and language structures – referencing or investigation conventions.	1-2
• does not satisfy any of the descriptors above.	0

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