



Queensland Curriculum and Assessment Authority

Digital Solutions 2019 v1.2

IA1: Sample assessment instrument

Investigation — technical proposal (20%)

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

This assessment instrument has been designed to be completed over a duration of four weeks.

Student name

Student number

Teacher

Issued

Due date

Marking summary

Criterion	Marks allocated	Provisional marks
Retrieving and comprehending	5	
Analysing	6	
Synthesising and evaluating	6	
Communicating	3	
Overall	20	

Conditions

Technique	Investigation — technical proposal
Unit	Unit 3: Digital innovation
Topic/s	Topic 1: Interactions between users, data and digital systems Topic 2: Real-world problems and solution requirements Topic 3: Innovative digital solutions
Duration	—
Mode/length	Technical proposal: <ul style="list-style-type: none">• Multimodal presentation: 9–11 minutes
Individual/group	Individual
Other	Titles, reference list and appendixes are not included in the presentation time. Students may use class time and their own time to develop a response.
Resources	<ul style="list-style-type: none">• Screen-capture software is available on the school computers.• Microphones will be available to loan.

Context

The Australian Computer Society (ACS) and the Open Data Institute of Queensland each year invite high school students to present a technical proposal at the Digital Disruptors pre-awards dinner. These technical proposals are always for a new innovative digital solution that solves a real-world problem and/or benefits Queenslanders. The attendees at the dinner will be ACS members.

Task

Prepare a technical proposal for the Digital Disruptors pre-awards dinner for a new innovative digital solution that uses open government data. You will analyse two relevant datasets from the Queensland open data portal (www.data.qld.gov.au) and select one to be used in your technical proposal. You will then present a multimodal presentation of the technical proposal to your teacher using communication appropriate for a technical audience.

To complete this task, you must:

- recognise and describe
 - data sources
 - appropriate programming development tools
 - useability principles and user-interface components
 - existing solutions to similar problems
- symbolise using mind maps and one or more of constructed sketches, annotated diagrams, images or screenshots of
 - user interfaces
 - programming features communicated by algorithms
- explain
 - user experiences
 - useability principles and accessibility features
 - data structures
 - programming features
- analyse the problem, data sets and information to identify
 - boundary or scope of the problem
 - constraints and limitations of the environment
 - data, programming and user-interface relationships
 - user experience
 - potential algorithmic implementations
 - possible personal, social and economic impacts
 - possible solutions
- determine
 - requirements from the user perspective for the user experience

- programming requirements
- required data
- prescribed and self-determined criteria
- synthesise information and ideas to select the best approach for
 - user interface/s
 - data structures of the proposed solution
 - coded components of the proposed solution
- generate a low-fidelity (non-coded) prototype solution including user interface, data and algorithms
- evaluate against criteria the
 - personal, social and economic impacts and considerations to identify risks
 - user-interface prototype
 - accuracy and efficiency of the algorithms
 - low-fidelity non-coded prototype digital solution
- make refinements and justified recommendations for current and future improvements.

Stimulus

A range of data sets and case studies can be found at:

- www.data.qld.gov.au/article/case-studies
- www.data.qld.gov.au/article/data-event/govhack/2016/wrapup

Checkpoints

- Submit exploration of solutions, identification of algorithms and user-interface sketches.
Date: _____
- Submit a complete draft in video format. Date: _____
- Submit final response. Date: _____

Authentication strategies

- Students will provide documentation of their progress at indicated checkpoints.
- The teacher will collect and annotate one draft.
- Students must acknowledge all sources.
- Students must submit a declaration of authenticity.

Scaffolding

Use the following headings in your response:

- Introduction (up to 1 minute)
- User story (3 minutes)
- Data story (3 minutes)
- Proposed solution (3 minutes)
- Conclusion (up to 1 minute)

The presentation of this investigation is multimodal. A multimodal presentation is the dynamic convergence of two or more communication modes within the same response and where all modes are attended to as part of meaning-making. Multimodal presentations can be delivered via different media or technologies. A variety of technologies are used to create or present the response. Replication of a written document into an electronic or digital format does not constitute a multimodal presentation.

There is no requirement for this presentation to be performed or conducted in front of the class or the teacher. For example, a multimodal presentation might be pre-recorded and presented to the teacher electronically. Each student may choose the mode/s and method of their presentation. These may need to be negotiated with the teacher.

Examples of a multimodal presentation include:

- a web page, in which elements such as visual effects, oral language, written language and still or moving images are combined
- a slideshow or animation documenting the application of the problem-solving process
- multimedia movies that may combine photographs, video, sound, text and a narrative voice
- a webinar or a vodcast.

Instrument-specific marking guide (IA1): Investigation — technical proposal (25%)

Criterion: Retrieving and comprehending

Assessment objectives

1. recognise and describe data sources, programming elements, user-interface components and useability principles
2. symbolise algorithms and user interfaces, and explain ideas and interrelationships between proposed data structures and user experiences of the identified problem

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"> • accurate and discriminating recognition and discerning description of data sources, programming elements, user-interface components and useability principles • adept symbolisation of algorithms and user interfaces and discerning explanation of ideas and interrelationships between proposed data structures and user experiences of the identified problem. 	4–5
<ul style="list-style-type: none"> • appropriate recognition and description of data sources, programming elements, user-interface components and useability principles • competent symbolisation of algorithms or user interfaces and appropriate explanation of ideas and interrelationships between proposed data structures and user experiences of the identified problem. 	2–3
<ul style="list-style-type: none"> • makes statements about elements and features of data, programming, user interface or useability principles • variable symbolisation of algorithms and superficial explanation of aspects of ideas or interrelationships related to the identified problem. 	1
<ul style="list-style-type: none"> • does not satisfy any of the descriptors above. 	0

Criterion: Analysing

Assessment objectives

3. analyse the problem and information related to the selected technology context
4. determine programming and user-experience requirements of the identified problem and prescribed and self-determined criteria

The student work has the following characteristics:	Marks
<ul style="list-style-type: none">• 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 programming and user-experience requirements of the identified problem and essential prescribed and self-determined criteria.	5–6
<ul style="list-style-type: none">• 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 programming and user-experience requirements of the identified problem and some prescribed and self-determined criteria.	3–4
<ul style="list-style-type: none">• superficial analysis of the problem or aspects of information to identify some elements or features of user interface or data 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
<ul style="list-style-type: none">• does not satisfy any of the descriptors above.	0

Criterion: Synthesising and evaluating

Assessment objectives

5. synthesise information and ideas to determine possible data elements, user interface and algorithm components for digital solutions
6. generate a technical proposal for user interfaces and algorithm components of the low-fidelity non-coded prototype digital solution
7. evaluate impacts, components and a low-fidelity prototype against prescribed and self-determined criteria to make refinements and justified recommendations

The student work has the following characteristics:	Marks
<ul style="list-style-type: none">• coherent and logical synthesis of relevant information and ideas to determine data elements, user interface and algorithm components for digital solutions• purposeful generation of a technical proposal for relevant user interfaces and algorithm components of the low-fidelity non-coded prototype digital solution• critical evaluation of impacts, components and low-fidelity prototypes against effective prescribed and self-determined criteria to make refinements and astute recommendations justified by data.	5–6
<ul style="list-style-type: none">• simple synthesis of information and ideas to determine possible data elements, user interface and algorithm components for digital solutions• adequate generation of a technical proposal for some user interfaces and algorithm components of the low-fidelity non-coded prototype digital solution• feasible evaluation of impacts, components and low-fidelity prototypes against some prescribed and self-determined criteria to make refinements and fundamental recommendations justified by data.	3–4
<ul style="list-style-type: none">• rudimentary synthesis of information or ideas to determine possible data elements, user interface and algorithm components for digital solutions• generation of elements of the low-fidelity non-coded prototype digital solution• superficial evaluation of impacts, components or low-fidelity prototype against criteria.	1–2
<ul style="list-style-type: none">• 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 written and spoken communication for a technical audience

The student work has the following characteristics:	Marks
<ul style="list-style-type: none">discerning decision-making about, and fluent use of<ul style="list-style-type: none">written, visual and/or spoken features to communicate about a solutionlanguage for a technical audiencegrammatically accurate language structuresreferencing and investigation conventions.	2–3
<ul style="list-style-type: none">variable decision-making about, and inconsistent use of<ul style="list-style-type: none">written, visual and/or spoken featuressuitable languagegrammar and language structuresreferencing or investigation conventions.	1
<ul style="list-style-type: none">does not satisfy any of the descriptors above.	0



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