Queensland University of Technology
Information Science

Assessment Task

IFN623 Human Information Interaction
Semester 2 2024

Assessment 1 – Theory Informed Design

Name	Assessment 1 – Theory Informed Design
Due	Week 6 (Formative component due Week 4)
Weight	40%
Submit	PDFs and video file (based on chosen format) via Canvas

Rationale and Description

Foundational to effective information interaction is an understanding of (a) the nature of human cognition, (b) the capabilities of the interactive technology, and (c) strategies for effective communication of information to provide a bridge between humans and technology.

In this assessment, you will explore these aspects by evaluating a Generative AI model's capabilities in specific cognitive areas, developing tests for these capabilities, and creating solutions based on the theories and design principles taught in the unit.

Learning Outcomes

A successful completion of this task will demonstrate:

1. Ability to apply relevant cognitive theories to evaluate AI capabilities in areas such as conversational fluency, thinking, embodied cognition, and predictive cognition.
2. Proficiency in designing and justifying tests to assess the performance of Generative AI models based on theoretical foundations.
3. Skills in critically analysing AI performance using test results, identifying strengths and weaknesses, and reflecting on human-AI interactions.
4. An ability to work effectively in a team to present work in a clear, coherent, and well-organised manner.
5. Ability to propose and justify solutions to enhance AI capabilities based on test outcomes and theoretical understanding.

Essential Elements

What is needed to succeed in this assignment:

1. **Understanding of Lecture Content.** Simply attending lectures and/or watching the lecture content will not be sufficient to develop a thorough understanding of the material in order to effectively apply it in this assignment. **What is required is for you to demonstrate that you can appropriately relate content to specific elements of the assignment task**. The inability to meet this crucial requirement will likely result in a failing grade.
2. **Practice of Tutorial Activities:** Engaging in tutorial activities to practice and receive feedback on relevant practical tasks is important for the development of a sufficiently thorough understanding of the content required to succeed in this assignment. If you

cannot attend a tutorial, notify your tutor ahead of time and complete the tutorial activity in your own time. Seek feedback from your tutor in the following week's tutorial. You are also encouraged to find a buddy in your class who can help you catch up on the content and vice versa.

3. **Deep Thinking, Critical Analysis, and Practice:** This assignment requires deep thinking and critical analysis to complete the tasks to a high level. Ensure that you reserve time for this process, noting that this unit (as with other 12cp units) requires 10-15 hours' work per week (which includes tutorials, lectures, research, revision/note-taking and assignment work)

Part A: Formative Group Presentation Due: **Week 4** (see Canvas for the exact date)

For Part A, you must demonstrate:

1. A sufficiently thorough understanding of a selection of theories taught in the first module (as they are presented in this unit).
2. The ability to express your understanding by appropriately applying the theory in specific cognitive areas.
3. The ability to work in a team to produce a short presentation.

This will be graded formatively as pass/fail, according to the Part A criteria sheet below. This grade will not count towards your final grade, but will provide you with guidance on whether you are meeting the requirements for the first stage of the assignment. A passing grade in Part A does not guarantee a pass for Part B.

Part B: Summative Individual Assessment Due: **Week 6** (see Canvas for the exact date)

For Part B, you must demonstrate:

1. The ability to design effective tests to evaluate the AI model's capabilities in three chosen cognitive areas.
2. The ability to provide a convincing justification for each test based on relevant theories taught in the unit.
3. The ability to clearly and appropriately document test outcomes with annotated/recorded examples, citing relevant design principles.
4. The ability to identify issues revealed by your tests and propose solutions to enhance the AI's capabilities, grounded in theory provided in the lecture content.

To best manage your time in this assessment, we strongly recommend that you work on the Part A (group) components in parallel to your Part B (individual) components of this assignment. Feedback provided in tutorials and Part A presentations can then be integrated to refine your Part B individual work.

Further details on the steps required for this assessment are outlined in the '***Detailed requirements***' section below.

Detailed requirements

Part A: Formative Group Presentation

Steps:

1. **Group Formation:** Form groups of 2-3 students.

2. **Choose Three Areas:** Select **three (3)** of the following cognitive areas to evaluate:
    - Conversational fluency
    - Thinking
    - Embodied, enactive, or extended cognition
    - Predictive cognition
3. **Create a Slide Deck:**
    - Prepare a slide deck with **three (3)** slides, **one for each chosen area**.
    - Each slide should address the question: "To what extent is the chosen Generative AI model capable of [selected area]?"
    - Explore this question based on your understanding of the theory. You may need to do some research of your own to guide your explorations
    - Note that minimal text should be included in the slides themselves – the presentation is mostly focused on what you say rather than what is written on the slides
4. **Presentation (during tutorial time in Week 5):**
    - Use the Booking form (to be released during Week 4) to book a time for your presentation in your scheduled tutorial
    - Present your findings in a 10-minute presentation.
    - Discuss the capabilities of the AI model in each chosen area, providing examples and insights.

Part B: Summative Individual Assignment

To be completed in parallel to Part A.

***note – this is to be completed as an individual. Whilst you may reference Part A work developed within your group, the following sections of the Part B submission must be entirely your own work.** Similarity in content submitted with other students' work (even students in your Part A group) will be flagged for plagiarism, even if wording is changed/rearranged. *It is therefore important not to discuss or share your Part B work with any other student in the unit*.

Steps:

1. **Develop a Test:**
    a) Choose three of the following cognitive areas to develop tests for:
        - Conversational fluency
        - Thinking
        - Embodied cognition
        - Enactive cognition
        - Extended cognition
        - Predictive cognition

    b) Design specific tests to evaluate the Generative AI model's capabilities in each chosen area. Note: these will need to be designed based on your understanding of the theories presented in this unit, and will require you to operationalise and define the practical outcomes of these concepts in order to test for them. You can start by considering "what does it mean for an agent to demonstrate [selected area]? It may also help to consider what capabilities these cognitive areas have in human beings, so that you can determine the presence of the same capability in a Generative AI agent.
2. **Describe and Justify the Test:**
    Write approx. 400 words to concisely detail the following for *each of your three tests* (approx. 1200 words total):
    a) A *short* description of your test (max. 100 words per test):
        - State the question that drives your test?
        - Briefly describe why you think it is important to test GenAI in this way

b) A justification for your test based on relevant theories taught in the unit (300 words per test):
   - Test design: The design will comprise a set of specifically designed prompts aimed at testing the level of a capability relevant to a given cognitive area.
   - Justification: Concisely justify the test design by expressing how your understanding of the theory informs why specific prompts are designed in the way you propose. It is important that your justifications are **relevant** and **convincing**.

c) Conduct the test according to your design and document the outcomes.

d) Provide an annotated example of each test outcome, either as:
   - **Screenshots of a select testing session:** Annotate the screenshots, noting where the AI succeeds or fails in regard to a capability, and critically analyse how this affects relevant interaction design principles*. Provide as much information as is necessary to show the results of your tests and justify your conclusions
     OR
   - **Screen Recording of a select testing session (up to 3 minutes):** Record the test and provide a narrated walkthrough, discussing the AI's performance and its implications on design principles*.

   ** When referring to the design principles: for example, if the genAI agent does not demonstrate the capability you are testing, what impact is that having on the interaction? Which design principle(/s) relate to that impact and why?*

3. **Provide Recommendations for a Solution:**

a) Based on the results of your test, provide the following (around 300 words):
   - Identify **one (1)** of the three cognitive areas that you tested and propose recommendations to improve the AI's capabilities in this area based on the test results.
   - Concisely justify the proposed recommendations using logical arguments which draw on relevant cognitive theories taught in this unit. Be specific about how a given recommendation addresses the improved capability.
   - Discuss the implications of the proposed solution for improving relevant design principles. Consider how your solution improves on the design principles you highlighted as part of step 2d.

In writing the written elements of your assignment, ensure that you always justify your assumptions, opinions and conclusions with evidence. In addition, please ensure your writing is:

- *Clear* — Your writing must be easily understandable to a non-expert reader by avoiding uncommon terminology and abbreviations.
- *Concise* — You must express your ideas efficiently, so that key points are not obscured by irrelevant material. In other words, always stick to the point you are trying to make without padding your writing with unnecessary words and sentences.
- *Coherent* — Your conclusions must follow logically from your assumptions.
- *Convincing* — The content that your present should be compelling and believable.

Referencing, use of AI and Academic Integrity

We expect that you will draw from some literature (at least some of the papers we have referenced for you for the design principles) in the written components of this assignment. If you draw from any ideas from any source other than the lecture materials, you need to provide adequate referencing.

Plagiarism is taken very seriously at QUT and multiple methods are employed to detect it. Not only is it a violation of the academic integrity policy to plagiarise; at a more basic level, it is unethical to take someone else's words or ideas and present them as your own. You will not be awarded any marks for sections that include copied text (even if the wording has been changed or rearranged), as the marks for someone else's ideas and writing do not belong to you. In addition, if the amount of work that is plagiarised reaches a certain level, we are required to report it.

Ideas that have been developed by others can be included in your work, as long as you reference where they came from. If you do draw from external sources, such as research papers, to support your claims and develop your arguments in written parts of this assignment, you will need to reference them appropriately. All references should be in **APA format** both in the body of the report and in the reference list.

For information on APA referencing, please see the following link:
https://www.citewrite.qut.edu.au/cite/qutcite.html#apa

Use of AI Tools

A component of this assignment involves the use of **AI tools**. Note that these ***should only be used in the way described in the assignment guide***. Using AI tools such as ChatGPT to generate parts of your written assignment without substantially transforming the text yourself is not permissible, and unlikely to meet the requirements as graded according to the marking criteria (which are created to specifically assess *your* learning).

Remember that these tools cannot attend the lecture or tutorials for you, and thus lack the depth of understanding of the specific theoretical content and practical applications as taught in this unit and assessed in this assignment. Thus, a generative AI algorithm will not have the necessary access to specifics, depth of understanding and critical analysis required to meet the specific requirements of the assignments to the same quality as you can. **Overly generic content that does not relate to specifics of what is taught in the unit or demonstrate your own learning will not meet essential criteria for a passing grade.**

Resources

The following resources will assist with the completion of this task:

- Weekly videos and shared materials provided on Canvas
- The Design Principles document and associated readings
- Slack to ask questions and discuss details of the task

Questions

Questions related to the assessment should be directed initially during the workshop or drop-in sessions or on the appropriate public Slack channel. The teaching team may address these questions publicly for the benefit of the whole class.

Please do not direct message (DM) assignment questions unless they are personally specific. Sensitive or private questions should be directed to the unit coordinator via email.

The teaching team will not be available to answer questions outside business hours.

Marking Criteria

Although a pass/fail grade is provided for your formative submission (T1), receiving a pass for T1 *does not guarantee a pass for your final submission.* Also note that the assessment does not require you to simply repeat contents of various teaching materials, but to provide evidence of your understanding of the materials and demonstrate your ability to apply that understanding in a way that is effectively communicated to the person marking your assignment.

You will *not* receive marks or percentages for this assessment. You will receive an overall grade on a seven point scale (e.g. pass - 4, high distinction - 7) based on the extent to which you meet the criteria. If the final grade for the assignment calculated based on weighted criteria includes decimal places, standard rounding will be used to determine the final assessment grade (i.e., each assessment grade will be a whole number).

Criteria Sheets – Assessment 1 – IFN623 Human Information Interaction

Part A (Formative feedback) Criteria Sheet

Criteria	7	6	5	4	3	2
TIER 1 (T1) - Foundation						
[1] Group's ability to understand and communicate theories taught in the first module, and to collaborate effectively to create and deliver a coherent presentation tied specifically to unit content.			Demonstrates a basic understanding of the selected theories taught in the first module, effectively communicates this understanding in their own words, and successfully collaborates as a team to produce and present a coherent, specific, and unit-tied presentation.		Fails to demonstrate a basic understanding of the selected theories, cannot effectively communicate this understanding, and/or presents generic or irrelevant material.	

Grades will be applied and feedback provided during presentation. If you miss your scheduled presentation time or do not schedule a time for your group's presentation, you will not receive grades or feedback for Part A.

See next page for Part B Criteria

Part B (Final submission) Criteria Sheet

Criteria	7	6	5	4	3	2
[1] Ability to apply cognitive theories taught in the unit to evaluate AI capabilities. (23%)	Excellent application of cognitive theories taught in the unit with thorough connection to the tests, demonstrating an exceptional understanding.	Very good application of cognitive theories taught in the unit with detailed connection to the tests, showing a strong understanding.	Good application of cognitive theories taught in the unit that is well-connected to the tests, demonstrating a good understanding.	Satisfactory application of cognitive theories taught in the unit that somewhat connects to the tests.	Barely satisfactory application of cognitive theories, lacking depth and clear connection to the tests.	Unsatisfactory or no application of relevant cognitive theories
[2] Ability to design and justify tests based on the cognitive theories taught in the unit (23%)	Excellent test design with comprehensive and robust theoretical justification, thoroughly connected to theories taught in this unit.	Very good test design with detailed and well-supported theoretical justification, specifically connected to theories taught in this unit.	Good test design with clear and relevant theoretical justification, specifically referencing theories taught in the unit.	Satisfactory test design and associated justification based on specific cognitive theories taught in the unit.	Barely satisfactory test design with insufficient theoretical justification, lacking reference to specific theories taught in the unit.	Unsatisfactory test or no design and associated justification
[3] Ability to critically analyse AI performance using test results to propose solutions with respect to design principles taught in the unit. (23%)	Excellent evidence of critical analysis showing clear and relevant connections between solutions and design principles.	Very good evidence of critical analysis showing clear and relevant connections between solutions and design principles.	Good evidence of critical analysis showing mostly clear and relevant connections between solutions and design principles.	Satisfactory evidence of critical analysis showing somewhat clear and relevant connections between solutions and design principles.	Barely satisfactory evidence of critical analysis with a lack of clarity and/or relevance in connections drawn between solutions and design principles.	Unsatisfactory or no critical analysis with regards to connections between solutions and design principles evidenced.
[4] Ability to propose and justify solutions to enhance AI capabilities based on test outcomes and theoretical understanding. (23%)	Excellent proposed solutions with comprehensive and robust theoretical justification (based on theories taught in the unit), thoroughly connected to test results and demonstrating excellent understanding.	Very good proposed solutions with detailed and well-supported theoretical justification (based on theories taught in the unit), clearly connected to test results and demonstrating very good understanding.	Good proposed solutions with clear and relevant theoretical justification (based on theories taught in the unit), well-connected to test results and demonstrating good understanding.	Satisfactory proposed solutions with some theoretical justification (mostly based on theories taught in the unit), somewhat connected to test results and demonstrating satisfactory understanding.	Barely satisfactory proposed solutions with insufficient theoretical justification, lacking connection to test results and lacking satisfactory understanding.	Unsatisfactory or no proposed solutions with inadequate/no justification and lacking and discernible justification.
[5] Quality of argumentation and the support provided for conclusions drawn in the analysis. (8%)	Excellent argumentation with comprehensive and robust support.	Very good argumentation with detailed and well-supported conclusions.	Good argumentation with clear and relevant support.	Satisfactory argumentation with some support.	Barely satisfactory argumentation with insufficient support.	Unsatisfactory or no argumentation with no discernible support.

*Note: **a grade of 1** is given where no assignment has been handed in, or where the part of the assignment associated with a particular criterion is missing from submission.*