Introduction
Although smartphones first emerged in the late 1990s to early 2000s, the modern smartphone era has been defined by the introduction of the iPhone (Apple Inc., 2007) and the Android operating system (Android Inc., 2007). These devices have revolutionized the way people all around the world live, work, and interact with each other. Part of their success has been attributed to their ease of use (or “usability”). In this applied project, you will evaluate a smartphone in terms of Natural Design.

Learning Outcomes
In completing this project, you will:
1. Apply the fundamental principles of interaction of affordances/constraints, signifiers, feedback, mapping, and conceptual model (a.k.a., Natural Design; Norman, 2013) to a case study, which will help you learn and remember foundational knowledge in the course.
2. Engage in a unique experiential learning activity in human factors, ergonomics, and design that is beyond the scope of the lectures.
3. Further develop your scientific research and writing skills, which are important abilities that are highly valued by employers and graduate schools.
4. Have some fun!

Submitting Papers
Your applied project write-up is due by the end of class on Thursday, February 25. You are required to submit an electronic copy via eClass. To avoid late penalties, your paper must be handed in before the due date & time.

Late Policy
Late papers may be submitted via eClass. Late assignments will lose 10% per 24-hour period, starting immediately after class is over. That is, if you submit your assignment 1 minute after class is over, you will lose 10%. If you submit your assignment 23 hours and 59 minutes after class is over, you will still lose only 10%. But if you submit your assignment 24 hours and 1 minute after class is over, you will lose 20%.

Alternate Assignment
If you do not have access to a smartphone (e.g., iPhone or Android-based phone) or have a compelling reason that prevents you from doing the applied project (e.g., you are legally prohibited from using a cellphone), you must contact the instructor as soon as possible. You will be given an alternate assignment of comparable scope to the applied project.
**Background**
Before you begin the walkthrough, it will help to explore some background information on the interaction design and user interface of smartphones:

- **Apple's Skeuomorphism in iOS** -- Although focused on the iPhone, the history of design discussed in this article applies to all smartphones.
- **Direct Manipulation: Definition** -- Gives pros and cons of DM, and contrasts it with skeuomorphism.
- **Flat Design: Its Origins, Its Problems, and Why Flat 2.0 Is Better for Users** -- An introduction to the kind of design used on current smartphones.

**Walkthrough**

Follow the walkthrough below. Describe how easy or difficult it is to perform each function, and explain why; be sure relate your findings to the fundamental principles of interaction/Natural Design. Do not Google the answers to find out how to do any of these tasks. (If smartphones are actually easy to use, you should not need any help.)

Consider the physical device itself.
- How do you primarily interact with the device?
- Is there a difference between a tap, long press, and hard press/3D Touch?
- How many buttons are there, and what do they do? Are there any functions that require you to press multiple buttons at the same time?
- Describe how you unlock your phone.

Since you have your phone in your hand already, you decide you might as well check your email.

Open the app that you use for your UAlberta email (e.g., Apple Mail, Gmail, Samsung Email, etc.).
- Describe the process of locating and starting the app. What does the app icon look like?
- What happens when you tap the correct app icon?
- How do you make sure the app has checked for the latest messages?
- How do you know how many unread messages you have?

Your PSYCO 494 instructor has asked you to send him an email to prove you are doing this project.
- Think carefully about (and describe) each of the steps you have to perform to complete this task.
- How do you know that your message was sent? (Yes, actually send me an email :)
- What information are you provided that helps you accomplish this task?
- Now go into your sent folder and take a screenshot of this email, to include in your write-up.

Oops--you forgot you had to attach a photo to your email!
- It is possible to undo the sending of an email? If so, how?

You remember that you are supposed to send a selfie to your instructor.
- How do you switch the from the rear-facing camera to the front-facing (selfie) camera?
- How many different ways can you take a photo (tap, press buttons, voice commands, etc.)?
- Try to send the email with the selfie attached by using your email app (not via the camera or photos apps). (Yes, actually send me a selfie :)
- What kinds of information are presented to indicate that you have taken a photo?
- Describe any problems or difficulties you encountered. If so, what would you do to change the design to make it easier to use?
- Include your selfie photo in your write-up.

Time to check social media. If you have a social media account, open an app (e.g., Instagram, Snapchat, Facebook, Twitter, LinkedIn, Reddit, WhatsApp, WeChat, etc.).
- Use the app to search for your instructor's profile or account on that platform.
- Which app did you use? What did you find? Describe the steps you took.
- If you found your instructor's profile, take a screenshot for proof. If you were not able to find your instructor's profile on the social media app you chose, take a screenshot of the search results.

It can be important to know your GPS coordinates (e.g., if you are hiking in the backcountry and lose your way).
- Time yourself to see how long this task takes you. First, start the stopwatch (typically this function is part of the built-in clock app).
- Next, as fast as possible, find your current GPS coordinates. Take a screenshot for proof. Then, stop the stopwatch. How long did it take you?
- Include the screenshot in your write-up. (If you wish to keep your location private, you may redact your actual GPS latitude and longitude values.)

Smartphones are heavily reliant on access to the internet. Turn off your Wi-Fi and cellular data (or turn on airplane mode).
- How many apps are installed on your phone? Count them all, including built-in ones.
- Now, try all of your apps: How many have reduced functionality without internet access? You do not have to test every single function offered by an app; just use the primary function. (For example, a note-taking app may have a cloud storage function that will not work without internet, but you can still use it to take notes.)
- Categorize the functionality of your apps (e.g., not functional, partially functional, and fully functional). How many apps fall into each category? (Give percentages as well.)
**Write-Up**

The body of your paper must be at least 5 full pages long, but not longer than 10 pages (any photos, screenshots, or diagrams do not count toward the page limit). You may use the first person ("I") in your write-up. Otherwise, you must write and format your paper in APA style. No abstract is required. A marking rubric is included attached at the end of this document.

The walkthrough is not intended to dictate the structure of your write-up. You may organize it any way you like, but you must address the learning outcomes of this assignment--do not just answer the questions in the walkthrough. Significant marks for your write-up will be given to your critical evaluation of the smartphone design, based on the principles of Natural Design presented in class and in Norman's (2013) book, *The Design of Everyday Things* (Revised and expanded edition).

**APA Style**

You may be familiar with MLA (Modern Language Association) style, which is about the mechanics of writing, such as punctuation, quotation, and documentation of sources. However, psychology term papers and professional journal articles require APA (American Psychological Association) style, updated to the 7th edition. APA style dictates fonts, spacing, margins, etc. It also explains how to cite, in the appropriate format, all sources of information--otherwise, you are claiming those ideas as your own (i.e., plagiarism); and how to reference all cited sources at the end of the paper.

There are links to important APA style resources in the term paper document. The University of Alberta Library has an APA Citation Style Guide; also see the recommended reading for the course: *Publication Manual of the American Psychological Association*, 7th edition (2020).

**Critical Questions**

Come up with two different critical questions about problematic aspects of design of your smartphone, and answer them (i.e., propose a redesign) using what you have about Natural Design. For example:

- Consider your typical day: What function is lacking or particularly difficult to find?
- Consider the typical day for a person who is differently abled: What aspect of the design makes it challenging for someone who has a disability to use the phone?

Place these questions in a separate section from the walkthrough. To receive marks for these critical questions, you must not repeat what you did for the rest of the walkthrough (e.g., "I tried to send another email" or “I tried to take a photo of my cat”).

**The Fine Print**

The University of Alberta is committed to the highest standards of academic integrity. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence.

Academic dishonesty is a serious offence and can result in suspension or expulsion from the University. These resources from Student Conduct and Accountability, and the University of Alberta Library can help:

- [Academic Integrity: Introduction to Academic Culture](#) - videos on citing, quoting, summarizing, and paraphrasing
- [Plagiarism](#) - plagiarism definition, and tips for avoiding plagiarism
- [Citing Quoting, Paraphrasing & Summarizing](#) - how-to document from the UAlberta Centre for Writers
- [Foundational Tutorials: Citing](#) - interactive tutorials on citing, plagiarism, and paraphrasing, with examples
- [Don’t Do It (Cheating & Plagiarism)](#) - Faculty of Science document on academic misconduct and resulting penalties
Name: ____________________________
OVERALL MARK: ______ /100

General presentation: ______ /10 (spelling, grammar, etc.)
comments:

APA style: ______ /10 (title page, margins, citing, references, etc.)
comments:

Walkthrough: ______ /10 (give a brief description)
comments:

Critical questions: ______ /20 (10 each; 5 for listing an issue, 5 for “solving” or interpreting it)
comments:

Application of natural design principles: ______ /50
  affordances/constraints: ______ /10
  comments:

  signifiers: ______ /10
  comments:

  feedback: ______ /10
  comments:

  mapping: ______ /10
  comments:

  conceptual model: ______ /10
  comments: