Assignment #1 (Team): Project Problem Description

Overview and Context

This assignment represents the first stage of a multi-part major team project that will continue until the end of the semester, culminating in the Synthesized Whitepaper and Team Oral Presentation Video assignments.

The Project Problem Description assignment asks your group to engage with the United Nations Sustainable Development Goals (SDGs), a set of 17 specific targets addressing significant global challenges to human prosperity. These goals are related to universally significant issues including poverty, inequality, climate change, environmental degradation, peace, and justice. The United Nations hopes its stakeholders—including professional engineers—can meet these challenges within the next 10 years. The SDGs have been/will be addressed at length in class.

As a team, you must identify an existing consumer product **designed to manage and/or improve life during the winter months in Canada** and communicate how it can be modified or improved in some way to address at least two of the SDGs. The product you choose must be a material object; it cannot be an app, website, or other piece of software.

For the purposes of this assignment, a "product" is any object a private citizen (e.g., you) can theoretically purchase on the open market for personal use. This can be something as simple as a shovel or as substantial as furnace or a piece of powered snow removal machinery.

If you are unsure whether the product your team has identified is appropriate for this assignment, please ask your instructor.

In later assignments, you will be asked to analyze the modified/improved product to determine how it addresses four "smart design" lenses:

1. Business Viability
2. Human Desirability
3. Technology Feasibility
4. Nature Circularity

For further information about these four lenses and the principles of smart design, please consult the "Project Planning – Introduction to the Four Smart Design Lenses" document (available under "Assignments" in our Blackboard course section site).

Instructions

A problem description is an extended, detailed introduction that supplies information about the status quo and why it needs to be changed. Your goal here is to persuade your audience that the product you have identified must be modified or improved to address the chosen SDGs. Strong problem descriptions support their claims with substantial evidence drawing from credible research and reporting.

For example, you might argue that the commercial production of pair of cross-country skis has implications for climate action (Goal 13) and responsible consumption and production (Goal 12). Perhaps there is a way to engineer a better ski that would help humanity to meet these two challenges.

At this stage, you do not need to detail the specific improvements/modifications you intend to make. Rather, you need to identify the problem that needs to be solved and maintain that focus. The intervention that you develop—the improvement/modification—will become the "solution" for the later assignments.

Review the *Information Literacy*, *Evaluating Sources*, *Referencing*, and *Literature Review* lecture materials, and consider the following questions:

- What is a logical connection between the product you've chosen and the SDGs you've selected? How, specifically, does the product contribute or relate to the SDGs?
- Where will your solution be deployed, and why? (e.g., in Southwestern Ontario? In Vancouver, British Columbia? On campus at the University of Windsor? Elsewhere?) In other words, identify and justify the scope of your project.
- What, briefly, is the current "state of the art"? This assignment includes a *literature review* component, which requires you to read and assess the merits of existing research in related fields. How, if at all, does existing research address your product's relationship to the SDGs you have identified? For example, can you identify, making direct reference to your sources, how currently available examples of this product contribute to the problems the SDGs aim to solve?

A problem description's core functions are persuasive and argumentative. You must:

- present factual, accurate evidence of the relationship between the problem, related to two or more SDGs, and the product (logos);
- persuade decision-makers that those facts constitute a problem that requires action (pathos);
- present your own competence and credibility as a team of writers (ethos); and
- appeal to the beliefs and values of your readers (pathos).

Effective problem descriptions orient readers with the issue at hand and persuade them that the proposal merits serious consideration. You should convince readers that the problem requires immediate attention, and that your team thoroughly understands the nature of the problem. Keep in mind that audiences are vast and varied. This piece of writing must appeal to a *range of readers* who may or may not be familiar with the topic area.

Overall Objectives

- Appeal to your audience's values and priorities to convince them that a particular problem needs solving (pathos).
- Report the results of credible initial research, delivering sufficient evidence to show that the problem exists (logos).
- Strengthen your ethos as a responsible and knowledgeable team by illustrating the team's familiarity with the context and complexities of both the product and the SDGs you are addressing (ethos).
- Clearly establish and justify the *scope* of your project. Successful projects limit their focus to a specific geographical location (e.g., a city, limited geographical region, or even neighbourhood).

Specifications

The document you submit must adhere to the following criteria:

- The problem description must be **2 to 3 single-spaced pages in length**, double-spaced between paragraphs and set in Times New Roman 12-point font with regular 1-inch margins.
- All in-text citations and bibliographic entries must correctly follow IEEE format; the references page must be included but does not count towards the page length requirement.
- Satisfactory assignments include at least three (3) credible, peer-reviewed sources related to your area of focus and produce a correct IEEE-style citation for each source.

- Pay close attention to the classes on *Information Literacy* and *Citing and Referencing*. Plagiarism may be reported to the Academic Integrity Office. If you are unsure about what plagiarism is, please contact your instructor or TAs *before* submitting your assignment. There are several resources, including TAs, the Leddy Library, and online materials that will help clarify what plagiarism is and how to avoid it.
- Design and organization at all levels should promote ease of use and create an ethos of professionalism.

Due Date and Weight

Due Date: Friday, February 17 at 11:59 p.m. *Eastern Time* via Blackboard.
Weight: 8% of final grade.

Note: As this is a team assignment, all team members will receive the same grade except in exceptional cases. Only one team member needs to upload the assignment to Blackboard.

Tips

- You may approach this assignment in either of two ways:
    - Some groups will be most productive if they start by identifying a product in which they are interested, then analyze whether it addresses two or more SDGs. A group can propose to "tweak" or modify the product as necessary.
    - Other groups will prefer to begin by identifying two or more SDGs about which their members are passionate. From this starting point, a group can research a product that does or could (with modifications as necessary) address these SDGs.
- The use of headings and subheadings will be invaluable in organizing the document and helping audiences to understand its contents quickly.
- Be sure to identify and describe a *specific problem that lies within the scope of the assignment*. In other words, vague descriptions that are not specific to a geographic or problem area outlined clearly in your assignment will be unsuccessful.