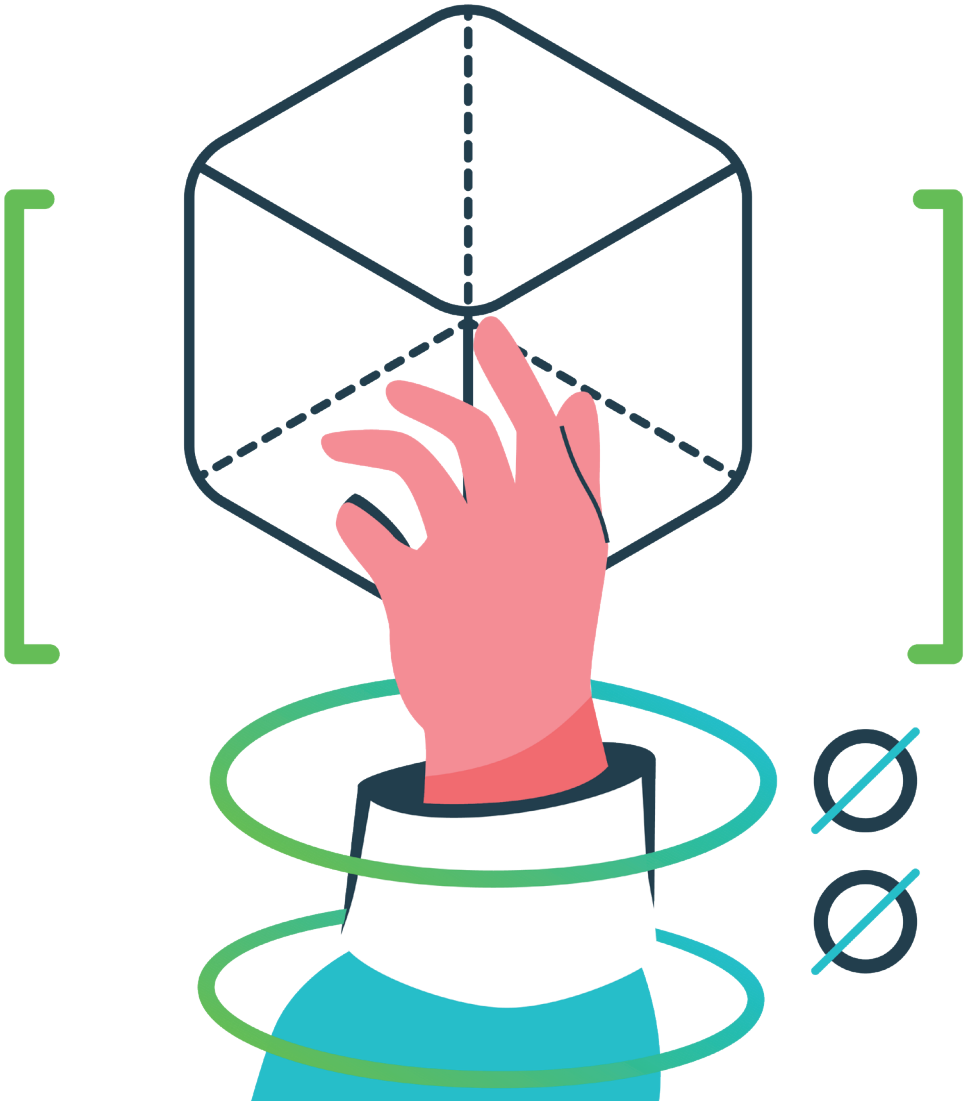
ecoAi circular



Assignments

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Assignments

Transforming Denim: Toward 100% Sustainable and Circular Production

Assignment 1: Understanding the Impact of Cotton Denim Jeans Company and Fashion Industry

The fashion industry is one of the most polluting in the world. The production oif clothing, especially popular items like jeans, generates a large amount of waste and has a significant environmental impact due to:

- **Resource Consumption:** The manufacture of jeans requires enormous amounts of water and chemicals. According to the European Environment Agency (2023), it is estimated that producing a single pair of jeans requires around 7,500 liters of water, from cotton cultivation to garment finishing. Annually, the volume of the EU clothing market produces around 37,892 million garments. On average, individuals buy 26 kilograms of clothes per year, but unfortunately, 11 kilograms are thrown away per person per year.
- **Textile Waste:** Often, overproduction and fast fashion lead to a significant amount of unsold clothing ending up in landfills, increasing the volume of textile waste.
- **CO_2 Emissions:** The transportation and production of clothing generate significant carbon dioxide emissions, contributing to global warming.

Exercise

After reading the documents listed in the Material List for Activity 1, discuss in groups or individually some of the following questions:

Discuss

- How does organic cotton differ from conventional cotton in terms of environmental and social costs, and what challenges does organic cotton production still face?
- What other costs and/or implications become apparent when cotton farming is viewed through the lens of other disciplines and professions?
- What special expertise, resources, or theoretical orientations might others bring to help us better understand the costs and/or implications associated with cotton farming?
- In what ways could the adoption of recycled or alternative fibers (like Tencel or recycled polyester) mitigate the ecological impacts identified in conventional cotton farming?
- What are the possible ethical and environmental trade-offs between using fibers ranked higher in sustainability (e.g., recycled cotton) versus lower-ranked yet widely available materials like conventional cotton?

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CASE STUDY: EcoDenim Co.: Leading the Transition to Full Circular Fashion

Assignment 2: EcoDenim Co Jeans Challenge

Introduction of EcoDenim Co Jeans

EcoDenim Co., a pioneering company in the production of eco-friendly jeans using organic cotton, is facing a new challenge to elevate its commitment to sustainability. Known for its focus on sustainable denim and its dedication to more responsible manufacturing processes, the company now seeks to strengthen its circular economy strategy and waste management practices. Although it has integrated sustainable practices from the start, the current goal is to deepen efforts in waste reduction, optimize recycling and material reuse, and solidify its position as a leader in sustainable fashion.

EcoDenim Co. has selected you to lead this challenge and develop a strategic plan that takes the production of its eco-friendly jeans to a new standard of sustainability. The objective is to implement more advanced circular economy measures that enable a closed-loop lifecycle for the brand's jeans, from the selection of recycled materials to the collection and recycling of used garments, and to optimize each step of the manufacturing process to minimize environmental impact.

For that, you can use the following app: https://www.makeyourjeans.redress.com.hk/

This application will help you become aware of the need to improve sustainability in this sector.

Keep in mind that you need to consider the following objectives:

- Reduce textile waste generation by 30% in the year by optimizing production processes and improving planning.
- Increase the use of recycled or sustainable materials by 40% in the next year by establishing partnerships with suppliers of eco-friendly fibers.
- Implement a program for collecting used jeans and increase customer participation by 25% in one year by incentivizing the return of garments through discounts or rewards.

After designing more sustainable jeans, discuss in groups or individually some of the following questions:

Discuss

- Where could you improve?
- Which step has the most impact on the environment?
- What is the consequence of producing a perfectly sustainable pair versus a completely unsustainable one?

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Assignment 3: Making EcoDenim Co Sustainable Products in Line with EU Norm

After watching the videos, discuss in groups or individually the following questions in order to develop a more sustainable product lifecycle analysis.

For each stage of the product lifecycle, you will receive a score ranging from 1 to 5 based on the sustainability practices implemented. Add your points for each stage and then sum them all up at the end (you can find the scoring guide in point 6). The evaluation includes key aspects such as material selection, production processes, distribution, consumer use, and end-of-life management. At the end, the scores will be consolidated into an overall sustainability rating, reflecting the total points achieved across all stages, where 1 indicates minimal impact and 5 represents the highest level of sustainability.

Stage 1. Product Design

- **Sustainable material selection:**
  - What alternative materials can be used (e.g., recycled fibers, organic fibers)?
  - Is it possible to use certified materials (e.g., GOTS for organic cotton)?
  - Do selected materials reduce the use of toxic substances?
  - Can the weight of the product be reduced without compromising durability?
  - Can the product be designed for easier recycling?

- **Sustainability Score (1-5):**

  1. Product Design: Scoring (1-5) / This section evaluates product design practices focused on sustainability. When scoring this section, students should specify the points considered, such as:
  - **1-2:** No sustainable or alternative materials are considered, and there is no focus on design for recycling.
  - **3:** Some sustainable or certified materials are introduced, but there is room for increasing their usage.
  - **4:** Certified sustainable materials are used, and the product is designed with weight reduction and recycling optimization in mind.
  - **5:** The design is fully optimized with sustainable materials, and the product is made to facilitate recycling at the end of its life.

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Stage 2. Production and Manufacturing

- **Sustainable manufacturing processes:**
  - Can low water consumption technologies like laser washing be implemented?
  - Can harmful chemicals (e.g., bleach) be eliminated or reduced?
  - Can renewable energy be used in production processes?
  - Is it possible to work with suppliers using responsible practices?
  - How can waste in production be minimized (e.g., reduced offcuts)?

- **Sustainability Score (1-5):**

  2. Production and Manufacturing: Scoring (1-5) / This section evaluates the implementation of sustainable processes during manufacturing:
  - **1-2:** No sustainable technologies are used, and non-renewable energy and harmful chemicals continue to be used.
  - **3:** Some improvements have been made, such as reducing chemical usage or collaborating with more responsible suppliers.
  - **4:** Technologies like laser washing are used, and waste is reduced through optimized processes.
  - **5:** The company implements sustainable production practices throughout the entire process, including the use of renewable energy and significant waste reduction.

Stage 3. Distribution and Logistics

- **Reducing transport impact:**
  - Can lighter materials be used to reduce transport emissions?
  - Are there options to consolidate shipments and reduce travel?
  - Can local distribution practices be implemented to minimize emissions?
  - Is it possible to use recyclable or reusable packaging?

- **Sustainability Score (1-5):**

  3. Distribution and Logistics: Scoring (1-5) / This section evaluates the impact of distribution practices on sustainability:
  - **1-2:** No measures are taken to reduce transportation emissions, and there is no consideration of recyclable packaging options.

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- **3:** Some improvements are made, such as shipment consolidation or the use of recyclable packaging.
- **4:** Emissions are reduced through local distribution and optimized packaging materials.
- **5:** The company implements highly sustainable distribution practices, using lightweight materials, consolidated shipments, and reusable packaging.

Stage 4. Consumer Use and Product Life Extension

- Extending product lifespan:
- Are jeans designed to be easily repairable (e.g., extra buttons, repair instructions)?
- Are care instructions provided to optimize product lifespan?
- Can customers return the product at the end of life for recycling or reuse?
- Is conscious consumption promoted (e.g., communications on prolonging product use)?

- **Sustainability Score (1-5):**
  - **4. Consumer Use and Product Life Extension:** Scoring (1-5) / This section analyzes how the product's lifespan is extended and promotes conscious consumption:
  - **1-2:** No care instructions or options for repair or product return are provided.
  - **3:** Care recommendations begin to be offered, and basic repair is promoted.
  - **4:** The product is designed to be easily repairable, and return initiatives for recycling are promoted.
  - **5:** The product's durability is maximized with a repairable design, clear care instructions, and an active recycling program.

Stage 5. End of Life Management

- Managing product end of life:
- Can the jeans be easily disassembled for recycling (e.g., separating buttons, zippers)?
- Is the product designed for compostability or full recallability?
- Are collection systems in place for reuse or recycling of jeans?
- Are there programs to give the product a second life (reuse programs)?

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- **Sustainability Score (1-5):**

  5. End-of-Life Management: Scoring (1-5) / This section evaluates how the product is managed at the end of its lifecycle:

  - **1-2:** No recycling systems or programs to give the product a second life are established.
  - **3:** Basic collection or recycling systems are starting to be implemented.
  - **4:** Component separation for recycling is facilitated, and reuse programs are implemented.
  - **5:** The product is designed to be fully recyclable or compostable, with an efficient collection system and established reuse programs.

6. Scoring Guide

The scoring system ranges from 1 to 5, with each level reflecting the degree to which sustainable practices are implemented and their impact on the overall sustainability of the product or process. This guide is designed to help assess and benchmark sustainability performance effectively.

- **Score: 1 - Very Low Impact on Sustainability**

  At this level, the company or product demonstrates minimal or no sustainable practices. It indicates a lack of commitment to sustainability, with almost no efforts to reduce environmental impact. This score suggests a need for significant changes and improvements to start integrating basic sustainable practices.

- **Score: 2 - Low Impact on Sustainability**

  A score of 2 reflects the presence of some sustainable practices, but they are limited and insufficient. There are initial steps toward sustainability, but major improvements are still needed. This level indicates that the company is beginning to consider sustainability but has not yet made substantial progress.

- **Score: 3 - Moderate Impact on Sustainability**

  At this level, the company has implemented several sustainable practices, achieving a moderate impact. However, there is still room for optimization and further improvements. The score of 3 suggests that the company is on the right track but needs to enhance its efforts to fully embrace sustainability and increase its positive environmental impact.

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- **Score: 4 - Good Impact on Sustainability**

  A score of 4 indicates that the company has established consistent and effective sustainable practices. These practices are well-integrated into the production process and show a strong commitment to sustainability. Despite the positive impact, there is still potential for minor improvements or optimization to reach the highest level of sustainability.

- **Score: 5 - High Impact on Sustainability**

  This is the highest score, reflecting a company or product that meets the best standards of eco-design and circular economy principles. Practices are highly sustainable, aiming to minimize environmental impact and maximize resource efficiency. A score of 5 indicates that the company is a leader in sustainability, implementing innovative solutions and aligning with industry best practices.

7. Calculating the Average Sustainability Score

After scoring each section, the average sustainability score for the entire product lifecycle is calculated. Follow these steps to determine the activity's average sustainability score:

- **Steps for calculating the average score:**
  - **Record the score for each section:**
    There are 5 sections to be scored: product design, production and manufacturing, distribution and logistics, consumer use, and end-of-life management.
    Each section is scored from 1 to 5, based on the established sustainability criteria.
  - **Example:**
    Product design: 4
    Production and manufacturing: 3
    Distribution and logistics: 4
    Consumer use: 5
    End-of-life management: 3
  - **Sum all the obtained scores:**
    In the example: 4+3+4+5+3=19
  - **Divide the total sum by the number of sections (5):**
    In the example: 19/5=3.8

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- **Round the average score if necessary (Interpreting the Average Score: 1.0 - 2.0: Low impact on sustainability; significant improvements are needed**.

  2.1 - 3.0: Moderate impact; some sustainable practices have been implemented, but there is room for improvement.

  3.1 - 4.0: Good impact on sustainability; solid practices are in place, but further optimization is possible.

  4.1 - 5.0: High positive impact on sustainability; aligned with the best practices in the industry.)

8. Overall Evaluation and Recommendations
After scoring each section, calculate the average sustainability score for the entire product lifecycle:

- **Average Sustainability Score:**
  - **Average of 1-2:**
    Indicates a low impact on sustainability, with many areas for improvement.
  - **Average of 3**:
    Indicates a moderate impact, with good initiatives but still opportunities for optimization.
  - **Average of 4-5:**
    Indicates a high positive impact on sustainability, aligned with best practices in eco-design and circular economy. After this, identify the three main areas where changes can be made to increase sustainability, such as improving materials, reducing energy use, or optimizing recycling.
- **Key Areas for Improvement: 1. 2. 3.**
- **Provide 3 specific suggestions** to improve the score, such as adopting water-saving technologies, establishing product collection programs, or using certified materials.
- **Recommendations to Enhance Sustainability:** 1. 2. 3.

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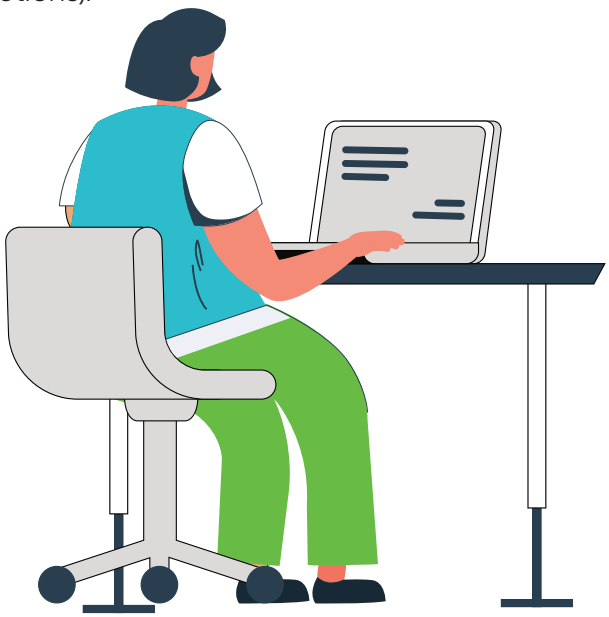
Assignment 4: Develop a Sustainable Canvas for EcoDenim Co.

(This assignment can be done individually or in small groups)

As an employee, you are now required to design and present a comprehensive action plan aimed at enhancing the sustainability for EcoDenim Co., focusing on achieving a closed-loop lifecycle with minimal environmental impact. Your plan should be detailed and structured according to the project template provided, ensuring that it includes all relevant research, strategies, and insights gathered during the previous stages of the assignment. Your action plan must cover key areas of the Sustainable Canvas such as:

- **Key Partners:** Identify collaborators (e.g., eco-friendly suppliers, recycling firms) who can help establish a closed-loop system.
- **Key Activities:** Include steps for sustainable production, waste reduction, and garment recycling.
- **Key Resources:** Specify sustainable materials (e.g., organic cotton, recycled fibers) and eco-friendly processes.
- **Value Proposition:** Highlight EcoDenim Co.'s commitment to sustainability, offering consumers jeans with minimal environmental impact.
- **Customer Relationships and Channels:** Focus on ways to engage customers in recycling initiatives and promote conscious consumption.
- **Cost Structure and Revenue Streams:** Emphasize investments in sustainable practices and potential revenue from eco-initiatives (e.g., recycled denim collections).



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