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EAS 550/STRATEGY 566: Systems Thinking for Sustainable Development

Lab 1 Systems Thinking
Instructions:

For this lab you will play an interactive, systems thinking game. Through your choices, synthesis of information, and prioritization you will recommend how a company should change how they operate. You will use systems thinking to uncover the different interacting processes of the company and deliberate between different options.

Like real systems analysts, you have limited resources such as time, money, or available data. In the game, your resources are bundled together and called "Research Points." At various stages, think about an overarching strategy: where would be the most useful to spend research points? Where can you avoid using research points? *(Hint: There are almost twice as many research points that could be spent than you have – being strategic about spending points is important, don't be afraid to spend zero on certain items)*
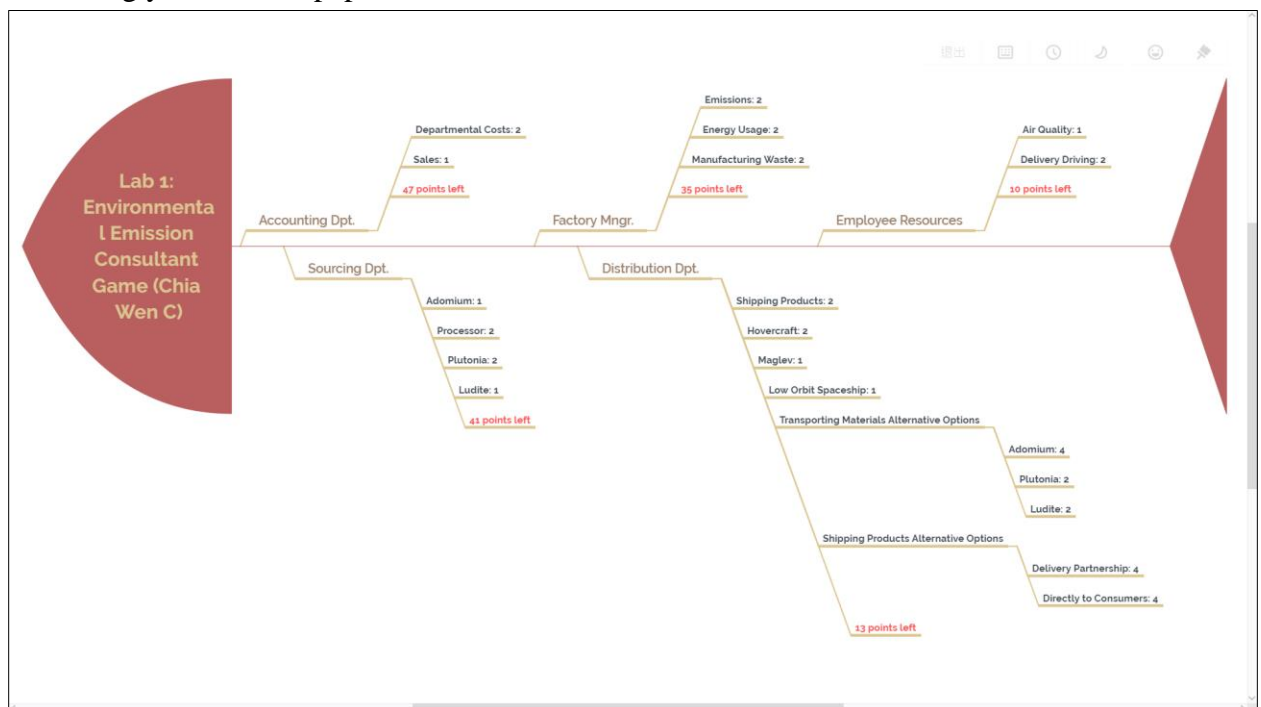
Open up the game: https://cbknox.itch.io/xantu
Click "Run Game" – it should automatically start in your browser.
Please do not play before completing the lab! The lab should be your first time learning about the system.

Once you finish, answer the following questions:
1. Sketch out the system and the options you encountered – this can be digital or a picture of something you drew on paper.

2. How do you think you did? Were you able to achieve your goals?

I only achieved half of my goals, which are to increase profits and to reduce emissions. However, I was very surprised when I received the results that I successfully improved the profits instead of reduced emissions because I focused more on calculating the emissions produced by each way over dollar costs. My decisions increased the drivers needed for shipping products and transporting adomium, but I only turned down the use of low orbit spaceship. This may indicate that the price of using low orbit spaceship is way far more expensive than any other operation elements, which is interesting because I did not get the accurate number for it.

I would not rate myself as doing a really great job fulfilling part of the goals, but I do not regret any decisions I made, either. I only knew there would be five sections that I could gain information from, but not the numbers of choices in every section. I planned to save my research points so that I would not run out of them before getting in touch with every department; simultaneously, I emphasized on the knowledge about emissions, where I spent maximum research points in learning getting raw materials, manufacturing, and transporting. I think I had at least tried my best to make every choice although the results were not perfect.

3. In 4-5 sentences, describe how you implemented systems thinking in your analysis and/or strategy.

I am not a risk-taker. From the start of the game, I was worried that I would have no research points in the last few sections for useful information. Thus, I took two strategies in the beginning—observed carefully and predicted the trend of options I had during the game. Since I had no idea about the possible number of choices and the potential risks despite running out of research points, I caught keywords from the introduction paragraphs and decided to focus on emissions produced during each process when I met with each department. I tried to save my research points for the most critical information related to emissions. But my strategy was forced to change when I approached Distribution Department, where a different pattern of having more than three sections to investigate appeared. I didn't know that I would have the least selections to make in the Accounting and Sourcing departments, neither did I know for some information, 4 research points were the maximum possible choice, so I changed my strategy from spending 2 points on most of the options—especially those related to emissions or compose of a higher proportion in manufacturing—to dismiss some options. In the last part of making analysis, I had only four changeable things, where all were heavily related to emissions and slightly related to dollar costs. So I kept my goal of decreasing emissions—although failed to—and changed the transportation of adomium to by maglev and products to directly shipped to consumers.

4. What information were you missing that would have been useful to have?

    I missed the number of hiring employees, hourly wages, and weekly hours information, which I think is very critical in real life decision-making. I thus lost control of making changes on these aspects, which I had never expected for. I decided to drop these sections because I guessed there would be a lot more to choose from in each of them. While I had very limited research points left and I remembered in the very beginning, the CEO or someone mentioned that they treated their employees well because they did not merely regard them as labors. I foresaw that I would not be willing to make much changes in the management of employees. Thus, I selected the other sections in the meeting with Employee Resources Manager, intending to improve the well-being and the quality of working environment of the employees.

    Reading through the results in the final report, I think I made a correct choice to not spend too many points on the hiring information because I may only wish to enhance the hourly pay for factory workers. I also found "Air Quality" not worthy of selecting because it only provided subjective perspective from the manager, refusing what were being complained by the employees.

5. If you were to play again, what would you do differently?

    If I knew I would have 10 research points left, I would definitely spend some in employee resources section. I may also make a chart, record every number I got, and calculate the emissions and costs more seriously and accurately for the final decisions. I did a rough one this time, taking notes of the confusing information I received, and relied on 'Data Tracking' to review information for making the final plan. Nonetheless, other than these, I would not make any choices differently because I am satisfied with the information I gained.

6. Copy and paste the text from the "Final Report"

Final Report:
Please copy this information and submit as part of your lab.
Remaining Research Points: 10
Choices:
Adomium:
0
Switch to Maglev
Plutonia:
0
Ludite/Neonite:
0
Keep Maglev
Processors:
0
Shipping:

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Switch to Direct Shipping
Number of Employees:
Factory Workers - 100
Office Workers - 10
Weekly Hours:
Factory Workers - 40
Office Workers - 40
Management - 40
Hourly Pay:
Factory Workers - 15
Office Workers - 30
Management - 90
Healthcare Tiers:
Factory Workers - 700
Office Workers - 1000
Job Satisfaction:
Factory Workers - 5
Office Workers - 5
Management - 5
Costs:
Sourching: $1265200
Factory: $35300
Distribution: $25325
Labor: $340480
Total Costs: $1666305
Emissions:
Sourcing: 3.68
Factory: 1.4
Distribution: 6.45
Total Emissions: 11.530000000000001
Considering the previous operating conditions of The Company, your recommendations have lead to the following changes:
Previous profit: $1,056,590
Your profit: $1333695
That is a difference of $277105
Previous emissions: 10.34 tx
You emissions: 11.530000000000001 tx
That is a difference of -1.1900000000000013 tx
Triggered Events:
Production Limit Hit:
Employees Quit:
If so, who quit:
Path Taken:
Start,One New Email,Download Attatchment,Decode Document,Accept Job,head to your local space port,Look out the window,Approach the Robot,Research Points,Try out Research Points,Data Tracking,Meet the CEO,Start meeting,The color suits you!,Company Priotities,Got it!,Right!,I understand,Ready for another meeting,Meet with Accounting,Helper bot, is that you?,Sure, I believe

you,Departmental Costs,Costs 2,Sure, I believe you,Data Tracking,Sure, I believe you,Gizmo and Gadget Sales,Sales 1,Sure, I believe you,Ready for another meeting,Meet with Sourcing,Confirm Review of Sourcing Information,Adomium Sourcing,Adomium Sourcing 1,Confirm Review of Sourcing Information,Processor Sourcing,Processor Sourcing 2,Confirm Review of Sourcing Information,Plutonia Sourcing,Plutonia Sourcing 2,Confirm Review of Sourcing Information,Ludite Sourcing,Ludite Sourcing 1,Confirm Review of Sourcing Information,Sourcing Alternative Options,Ready for another meeting,Meet with Factory Manager,Ready to meet with the Factory Manager,Direct Emissions,Emissions 2,Ready to meet with the Factory Manager,Energy Usage,Energy 2,Ready to meet with the Factory Manager,Data Tracking,Ready to meet with the Factory Manager,Manufacturing Waste,Waste 2,Ready to meet with the Factory Manager,Ready for another meeting,Meet with Distribution,Start Meeting with Distribution,Nice hat.,Ready to learn more about Distribution,Shipping Products,Shipping 2,Ready to learn more about Distribution,Transport via Hovercraft,Hovercraft 2,Ready to learn more about Distribution,Transport via Maglev,Maglev 1,Ready to learn more about Distribution,Transport via Low Orbit Spaceship,Spaceship 1,Ready to learn more about Distribution,Transporting Materials Alternative Options,Data Tracking,Transporting Materials Alternative Options,Adomium Transport Options,Adomium Transport 4,Transporting Materials Alternative Options,Plutonia Transport Options,Plutonia Transport 2,Transporting Materials Alternative Options,Ludite Transport Options,Ludite Transport 2,Transporting Materials Alternative Options,Shipping Products Alternative Options,Delivery Partnership,Delivery 4,Shipping Products Alternative Options,Direct Shipping to Customers,Direct Shipping 4,Shipping Products Alternative Options,Ready for another meeting,Meet with Employee Resources,Start Meeting with Employee Resources,Yeah, I guess?,air quality issues,Air Quality 1,Yeah, I guess?,number of delivery drivers,Delivery Drivers 2,Yeah, I guess?,Employment Alternative Options,Ready for Analysis,Data Tracking,Ready for Analysis,ready to make your final choices,Data Tracking,ready to make your final choices,Data Tracking,ready to make your final choices,I am finished making choices,Give me the results,Meet with CEO to share results,Great job!