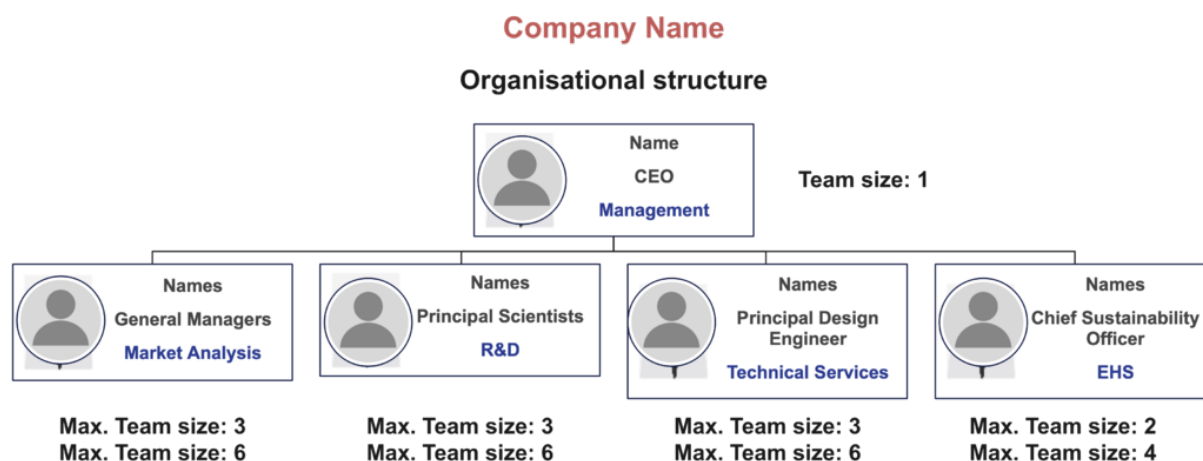


## CHE261-Project

For this project, you will incorporate virtual companies. Each company will have the following organizational structure. Each company (including the CEO) will have a size of 12 to 20 people.



**Each company will do following activities:**

1. Management: CEO will oversee each step described below.
2. Market analysis: Identify high-value chemicals that can be made in India. You will screen at least 3 such chemicals and finalise one chemical. These chemicals will not be from bulk chemicals. They would be from fine or specialty chemicals. It will not be a consumer product. Some examples include intermediates used in agro, pharma, paint, surfactant, perfume, beauty products etc. When finalising you will consider profitability, availability of raw materials, safety. (Some useful resources include reports available on chemical industry from <https://chemicals.gov.in>, <https://www.ibef.org/>, <http://cpmaindia.com>, KPMG etc.). Get material input cost and product cost from Internet (e.g. [Zauba](#) which tracks import and export data)
3. R&D - chemical synthesis: R&D team will come up with chemical reactions and separation steps from lab-scale research available on internet. R&D team will give chemicals required, purity and yield of the product that can be achieved. Supporting patents & research articles will be collected. (Scifinder; [register an account using IITK address](#), Google Scholar/Patents)
4. Technical services: Takes inputs from the R&D team, market analysis team, and management. Design team will develop a block diagram for scaled-up process, perform material balance, identify unit operations and operating conditions. Capacity of the plant would be 1000 kg/day of product. Technical services team will also evaluate the approximate capital cost (you can use this reference. <http://www.matche.com/equipcost/Default.html>).

5. Environment, Health, and Safety (EHS): Based on the inputs from technical services team, EHS team will identify safety concerns, estimate the amount of waste generation & propose a plan to monitor and treat them to environmentally benign compounds for disposal.

Although these tasks appear to be sequential, it is necessary that all team members coordinate and work simultaneously.

### **Important milestones:**

1. Register a company. You get Rs 250 virtual coins. 100 coins/week will be deducted as CEO cost.

**Due date: 20th March 18:00.**

(Registration form: <https://forms.gle/cnfmBbtMR8dBJUYGA>)

Responsible division for this task: CEO/Management

2. Registered companies can choose to merge with others without violating the total team strength. Only one chance for merging teams. Coins will not be transferred. 100 coins penalty will be levied on merger. Companies which already registered their team are not eligible for merger.

**Due date: 24th March 23:59.**

(Email the merger details to [ragipani@iitk.ac.in](mailto:ragipani@iitk.ac.in))

Responsible division for this task: CEO/Management

3. Register the organisational structure of your company. You will get 200 coins per person (besides CEO) in your team. Salaries for your employees will be deducted at 80 coins/person/week.

**Due date: 25th March 23:59.**

(Fill the template and upload here: <https://forms.gle/sck7bAsHDjqfKCYA9>)

Responsible division for this task: CEO/management

4. Patent your chemicals (minimum 1- max 3) - first-cum-first serve (You will get 1500 coins for each chemical registered).

**Due Date: 5 April 2023 by 23:59**

(Fill the template and upload here: <https://forms.gle/CbJmiiAyWScW26Rd6>).

Responsible division for this task: R&D

5. Submit the market analysis report for the patented chemicals (minimum 1- max 2) (You will get 1500 coins for each market analysis report). You will do trade research and economic feasibility using input-output material cost.

**Due Date: 6 April 2023 by 23:59**

(Fill the template and upload here: <https://forms.gle/EQnEwGYsECp8nvR3A>).

Responsible division for this task: Market Analysis

6. Patent your process (min 1 - max 2) (You will get 2500 coins for each technically feasible block diagram); You should apply process patent for the chemical you patented in previous step. For each chemical, only one process patent will be issued. You will also present reactor costing.

**Due Date: 9 April 2023 by 23:59**

(Fill the template and upload here: <https://forms.gle/wm3HLsYBTcNzyoA37>).

Responsible division for this task: Technical Services

7. Apply for environmental clearance by submitting EHS report for the best process (You will get Rs. 1500 for a valid application).

**Due date: 10 April 2023 by 23:59.**

(Fill the template and upload here: <https://forms.gle/MEHHdMYg7ahMhS1x7>)

Responsible division for this task: EHS

The game ends on 10 April 2023 by 23:59. All the reports have to be signed by the authors with their contribution clearly stated. CEO can upload the reports prepared by the company sub-divisions. Employee cost will be deducted for 3 weeks for all teams.

Company with highest virtual money wins. Top two winning companies will get surprise rewards.

**Grading (max. marks - 20):**

**CEO:** Will get 15 marks if the company completes all the above milestones. 5 marks based on overall earnings and productivity.

**Employee:** 8 marks for individual contribution. Another 8 marks for your company sub-division (say, technical services) performance. 4 marks for overall company performance.