CONCEPT DEVELOPMENT REPORT

Objective - Present the development of your project idea.

1. Preface

a. Title page with the project idea, team members' names, project title, and a table of contents.
b. The table of contents should have a page number on the right side and all the following pages must be numbered in order.

2. Project Summary and Background

a. Briefly describe the project. Focus on the end goal and not the technology.
b. Briefly describe previous work done on the project in CoE.

3. Use Case

a. Tell a story about how an end-user will be using your system.
b. Highlight the benefits of your system and describe an event/scenario where the system will be used.
c. It should focus more on the key tasks you wish to accomplish in a year.
d. The rest of the report should support this use case.

4. Project requirements

a. List down the requirements that your system needs to satisfy. These can be categorized as mandatory requirements and desirable (Stretch Goals) requirements.
b. The requirements should describe the tasks or activities that the system will perform during its operation.
c. Try setting rigid performance parameters for each of your requirements.
d. Briefly mention how you obtained your requirements

5. Literature Study

a. Mention and summarize the seminal work and state of the art systems/technology relevant to your project.
b. Include the most widely used approaches for solving your problem.
c. Identify any drawbacks that exist and describe some innovative ideas with the potential to solve the problem.
d. Cite material published in reputed journals.

6. Proposed System Architecture

a. Create a block diagram that mentions different subsystems and functions that form the overall system. Identify what functions are carried out by the system and develop this architecture through the functional decomposition of your system.
b. Mention the important subsystem functions and highlight their interdependence. Do not use generic names for subsystems. They should be tailored to your system. (Example: instead of simulation, sensing, etc use simulation of Kundur 2 area model, person detection, etc)

c. It should not identify specific components of a system like a sensor, hardware devices, or processor types. These choices can be depicted in cyber-physical architecture.
d. The purpose of the functional architecture is to highlight the hierarchy in your system. It should allow realizing the system as a composition of multiple subsystems. This will eventually help in work breakdown and setting project milestones.

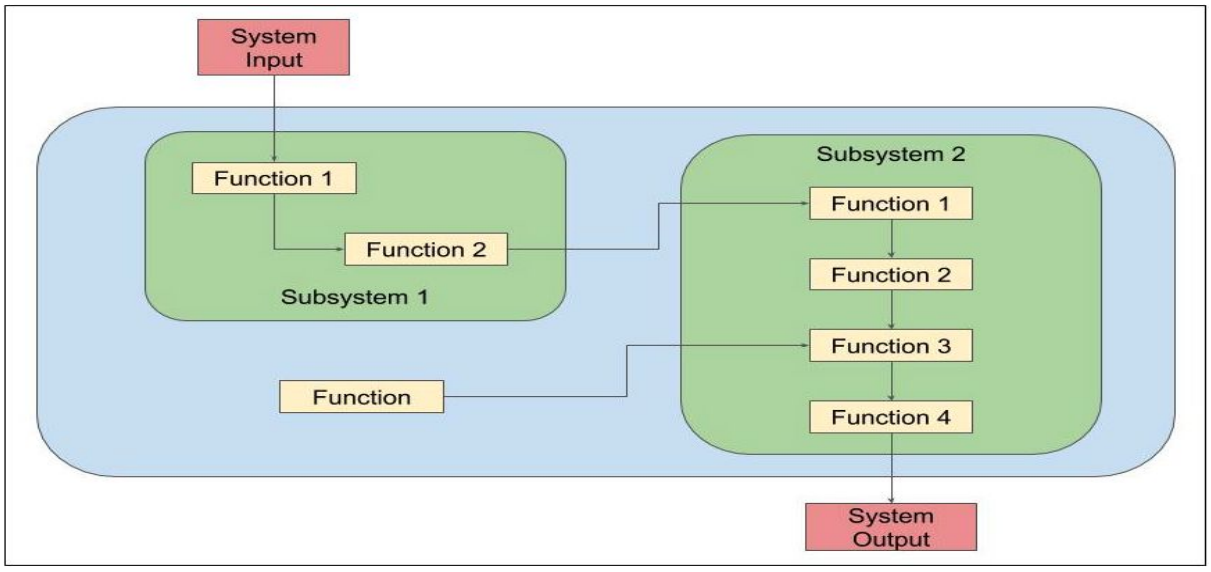

Fig: Example System Architecture

7. Hardware-Software Architecture

a. This section should parallel the functional architecture and establish the technological options that help execute the system functions.
b. Mention the specific components which will be used to achieve the desired functionality. Also, highlight the information flow/dependency between the components.
c. Mention the specific inputs and outputs of each functional block.

8. Subsystem Descriptions

a. Describe each of your subsystems in detail. Include any drawings, photos, or graphical depictions of each subsystem.
b. Include block diagrams of individual subsystems in detail.
c. Summarize the role of each subsystem in the overall system performance.

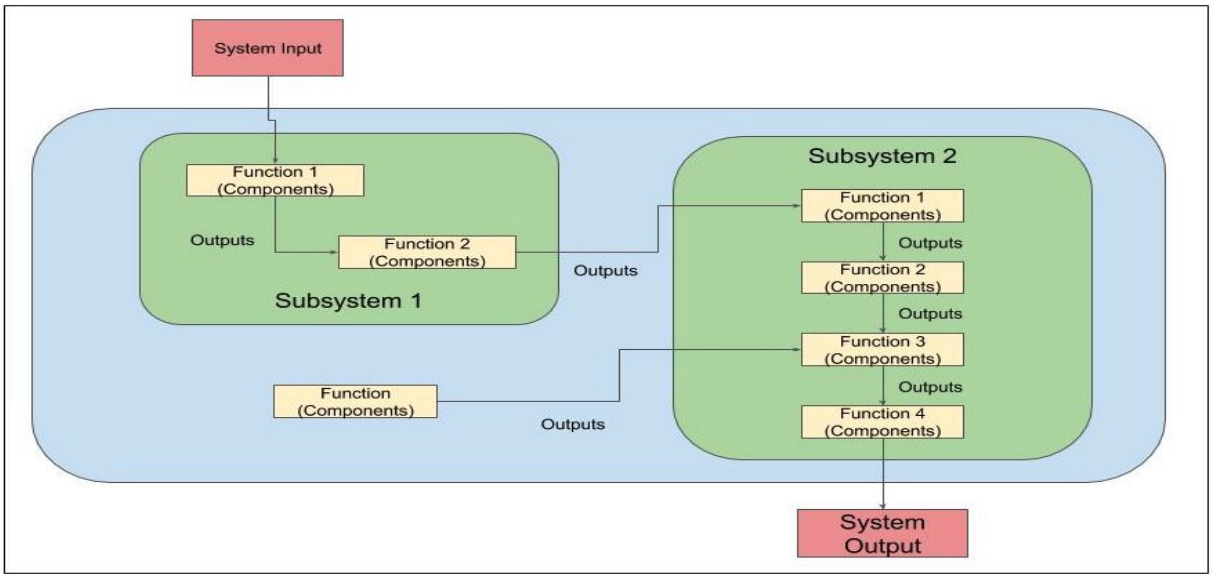

Fig: Hardware-Software Architecture

9. Work Breakdown Structure (WBS)

a. List down all the technical tasks in your project. The breakdown of tasks should be down to the smallest of levels.

b. Generate all activities you can think of that will have to be done and then group them into categories. (Bottom-Up Approach)

c. Start at the highest, top-level activities and systematically develop increasing levels of detail for all activities. (Top-Down Approach)

d. Brainstorm a list of activities without worrying about specific details. Don't make judgments regarding the feasibility of an activity. Write everything down and compress that into a feasible WBS.

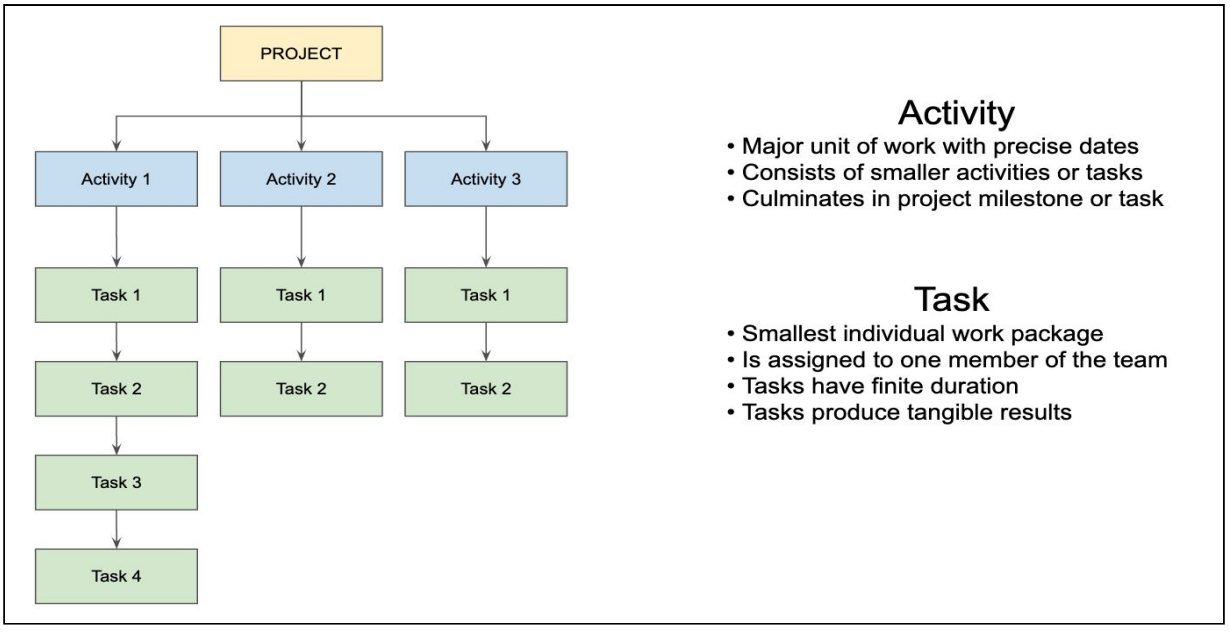

Fig: WBS Layout

10. Schedule

a. Project schedule - Schedule each of your tasks from the WBS.

b. Provide a detailed and realistic schedule for the 7th semester. Take into account the documentation that needs to be done and plan the execution accordingly.
c. Milestones - Set some target milestones and include a rough idea of what task will be accomplished at each milestone. This would include the completion of a single subsystem, integration of multiple subsystems, etc. Try and include at least a couple of major milestones for both the semesters.

11. Parts List and Budget

a. List down the hardware/software components required for the project and their individual costs.
b. Try and provide a rough list of the required material and the expected total cost of the project.

12. Team Member Responsibilities

a. List down the specific responsibilities of each member of the team.
b. Assign a project manager to be the point of contact for the team. Also, make sure to divide technical work at a high level among the members of the team.

13. Contingency Plan

a. Mention the potential points of failure in your project. For example, dependency on the availability of a certain hardware/software component or the efficiency/accuracy of a particular algorithm.
b. Describe an alternate implementation/goal in case of failure of primary methods.
c. In the case of hardware-based projects, list down potential risks to the user/developer due to hardware failure and plans to mitigate such risks.

14. References

a. Cite every research paper, book and other sources referred to in the report.

REFER THE LAST PAGE FOR FORMATTING GUIDELINES

The table below gives a loose guideline for the number of pages per element and the exact number of points per element.

Concept Development Report Element	No. of Pages	Weightage
1. Project Summary	0.5	5
2. Use Case	0.5	5
3. Project Requirements	1	15
4. Literature Study	2	15
5. Proposed System Architecture	2	25
6. Cyber-physical Architecture	2	35
7. Subsystem Descriptions	3	45
8. Work Breakdown Structure	2	20
9. Schedule	1	10
10. Parts List and Budget	0.5	5
11. Team Member Responsibilities	0.5	5
12. Contingency Plan	1	10
13. References	1	5
Total	**17**	**200**

Formatting Guidelines

1. The first page should contain team details and project title
2. The second page should be a table of contents
3. Margins 1” all around
4. Single spaced paragraph with one-line spacing between paragraphs
5. Paragraph Justified
6. The first line of the paragraph indented 0.25”
7. First-level heading: Arial 14 pt
8. Second and Third level heading: Arial 12 pt
9. Text: Times New Roman 12 pt
10. Table Header: Arial 12 pt
11. Figure/Table Captions: Times New Roman 10 pt Bold
12. All references cited in text
13. No typographical and grammatical errors