**Solution Approach**

The solution begins with identifying the problem clearly. All the issues will be delineated beforehand so that all the involved parties have a pellucid understanding about every single detail. OJO believes that spending an appropriate amount of time on outlining the issues produces great results and alleviates many of the issues projects experience during their development lifecycle. After this stage of the project the most efficient solution should be devised. In this conceptual design phase of the project OJO always appreciates innovative solutions to the problems. A simple solution to a complicated problem is always the goal. OJO strives to achieve this and there are many actions that the company has taken to move toward this goal. By creating a positive and creative environment at OJO, our members come up with groundbreaking ideas and can present their ideas to others without any hesitation. After the solution has been proposed and a basic conceptual design agreed upon, the overall design shall be broken down into subsystems so that work can be done in parallel. All the dependencies must be identified so that the timeline can be prepared. All the tasks that are independent of each other can be done by different team members while the tasks on which other tasks depends on can be identified and assigned critical status. Human resources can be assigned accordingly, and any some time buffers can be assigned around critical tasks so that and unfortunate circumstances do not affect the timeline.

For our project, the platoon, we have identified all the tasks that need to be accomplished and created a timeline.

**Tasks**

* Conceptual Design of overall system

Solution to the complete system is proposed at a higher level. This is a critical task and needs to precede all the task. All the human resource shall be assigned to this task.

* Creating bill of material

A complete list of materials to be bought is created and updated according to the project budget.

* Procuring components

Components orders. Other theoretical things can be done during this phase.

* Gather theoretical knowledge about components

While waiting for the components the datasheets can be read and a testing environment can be created.

* Component testing

Once the components arrive testing of the components can begin immediately since the testing environment was already created. It is important to establish that all components are working as expected before they are combined and used together. Trouble shooting will be easier if all components are tested.

* Effectiveness of components evaluated

Data is collected for the components to evaluate their performance.

* Eliminating subpar components

For a task the best possible solution is selected. Any component that does not satisfy the requirements is eliminated. This phase can begin soon after the testing of the components.

* Conceptual design of modules

During the same time where the components are being evaluated, the conceptual design of the modules of the project can begin so that they can be implemented.

* Creating microprocessor Image processing algorithm

If image processing is used to follow the robot, an algorithm must be written and tested. This task can be done in parallel with all the other module implementation.

* Implement motors and drivers

Motors and their drivers must be implemented and interface with the microcontroller.

* Interfacing microprocessor and microcontroller

The main microprocessor will run all the computationally intensive algorithms while the microcontroller will be used to drive the moving components of the robot. There must be a protocol for both devices to communicate seamlessly.

* Implement Power System

For this mobile device a battery powered power delivery system must be created. Since each part of the project relies on this module higher priority can be given to this task during the initial phase of implementation of submodules.

* Create a robot chassis

This task is independent of all the other tasks during the implementation phase.

* Testing and design revision of submodules

According to the evaluation rubric the performance of the subsystems can be evaluated, and the design can be improved to score better on the rubric. All of the modules will be improved as required and resigned and revised.

* Final Testing of modules

This task will be initiated after the implementation of all the modules. At this stage after the performance of all the modules is up to the desired specifications the module will be put through a stress test to elaborate any problems that were not observed during the initial testing. Any major design flaws can then be dealt with at this stage.

* Documentation

Formal documentation for our products will be created at this stage.

* Setting standards

As the product is supposed to work with devices created by other companies, standard specifications with precise tolerances must be clearly defined for product compatibility. This task starts from the very start of the project up to the implementations of the modules.

* Demo and presentation of modules

The ready modules shall be demonstrated. This will satisfy the client about the progress and increase confidence in the company’s abilities.

Meeting the deadline always makes the customer happy. To keep up with the deadlines defining a timeline is important. The defined timeline should be possible to keep up to, so the time required for each step is thought of individually and then combined instead of trying to manipulate the timeline to fit the deadline.

Theoretical and analytical work on the design

Work must be done on the details of overall project. Theoretical work must be done.

Finalizing the theoretical design

The design has to be thoroughly evaluate, and potential issued should be identified, the theoretical design can then be iteratively designed and finalized.

Practical implementation of the project

After finalizing the design, the modules can be combined according to the theoretical design.

Testing and improving the product

After the components are combined the overall design can be improved and tested for problems.

Demonstration of the complete product

Finally, the final version of the project can be demonstrated to the customer their reactions can be recorded. This can be useful for evaluating the overall project.

To accurately evaluate the project through the various stages of its development life cycle, be an evaluation rubric must be designed so that the health of the project can be measured in an objective manner. A preliminary rubric for the project has been created for this purpose. This rubric shall also grow with the project as more information is gathered from experience.

To understand the progress of the project, milestones can be defined. The milestones not only serve to evaluate progress but also serves as motivation of team members to strive to achieve them.

The milestones for our project are as follows.

1. Complete the detailed conceptual design of the overall project.
2. Components evaluated and shortlisted.
3. Submodules implemented. All submodules perform their respective tasks.
4. All the submodules comply with the evaluation rubric.