

What were the outcomes of the prior phase?

1. What did I plan to do?

I planned to introduce myself to the design processes we would employ during the introductory phases. Also, to consider which aspects of electrical engineering (which courses) would I need to be prepared to employ in designing the electrical systems of our project. I planned to develop a method with the other Project Co-Manager to schedule and delegate tasks to team members and sub-teams, and a plan to manage risks as early as possible.

2. What did I actually do?

Through the resources provided by the MSD department I was able to become aware of the design processes this course will teach. Regarding my position as a member of the electrical team, we have begun exploring the power distribution and control systems in terms of their system architecture, component benchmarks, and interfacing with mechanical and software systems. Defining the problem definition and customer and engineering requirements has provided a strong basis for our functional tree, transformation diagram, morphological chart as the first steps in system design. As Project Co-Manager I have practiced coordinating among team members to perform tasks efficiently. With the other Co-Manager, we have developed the outline for a routine scheduling and delegating plan to begin employing in Phase 2.

3. What did I learn? How were the plan and reality different?

As an electrical team member, I learned that the level of involvement in interfacing electrical components with the engineering requirements and the many mechanical and software system requirements is very high. Each component will take a significant amount of time to analyze, benchmark, select, review, and interface. In a managerial position, I learned how important being aware of the tasks and deliverables, and state/process of each team member is for the rest of the team. In order to advise and facilitate the direction of the project, I must remain vigilant. I learned that it will be integral to our success to maintain and promote an entrepreneurial mindset by employing a full-context level of systems thinking about the project.

Team level goal for next phase

Formulate system architecture while putting forth the best effort to complete tasks correctly the first time. Efficient use of people resources and time will allow the team to improve performance.

What do I plan on doing to ensure that my team has a successful review at the end of the next phase?

Electrical Team Member:

1. With the other electrical team member, develop a section of the overall morphological chart that describes the system level impact each electrical component could have on the project. This involves comparing a variety of the potential selections. Due to the relative similarity of 3D printer electrical systems this task should take no more than 4 hours. It should be performed immediately in the System Design phase to allow time to review with external and internal resources in preparation for the review.
2. Perform a feasibility analysis on the selection of controller boards that direct the control of system processes. This task should take place while the activities related to the functionality of each component are being completed. This process requires between 2 and 4 hours of work, unless other sub-teams determine the need for additional functionality which I do not consider initially.
3. Thoroughly develop the power distribution Transformation Diagram. Importance should be placed on this task because of the system-wide interfacing required. In contrast with the control systems (which are relatively standard across 3D printers) a power distribution system will be specific to the design of our machine. I estimate this task may take as long as 4-6 hours to complete including the draft, seeking external review, and performing internal review. It must be done before the next Project Phase Review so the work can be spaced out.

Project Co-Manager:

4. Perform online modules several class days in advanced to be prepared to facilitate a schedule of events with the rest of the team. This will contribute to the critical function of the manager to maintain a full-context systems level focus. It should only require an additional 1 hour per week.
5. Implement the scheduling process the other Co-Manager and I designed. This includes:
 - a. Use class meeting time to compile sub-teams work and for administrative events
 - b. Maintain a dynamic, accessible, priority-based schedule such as a Gantt Chart
 - c. External review of critical-path tasks 2-3 weeks out from the Phase Review
 - d. Internal review of the external feedback as implemented into critical-path tasks 1-2 weeks out from the Phase Review
 - e. Peer reviewing critical-path tasks with another MSD team 1-2 class days before the Phase Review
6. Implementing a delegating process the other Co-Manager and I designed. This includes:

- a. Lay out tasks by priority level and time commitment using a matrix that determines the importance of each task
- b. Define which tasks should be completed by the team as a whole and those by sub-teams alone
- c. Assign tasks to sub-teams or individuals
- d. Assign tasks a dynamic due date/time range by use of the importance matrix
- e. Maintain close coordination with the schedule facilitator in order to monitor the priority and completion of each task

What is standing in my way of meeting my next phase goals?

The processes described above are an effort to manage risks before they become substantial. The review process of 5 should provide lots of feedback and revision to each task before they are submitted to the Phase Review. Standing in our way of achieving this is largely oversight of task importance by the managers, and mismanagement of individual member time commitment. The critical-path tasks in the System Design Phase are so crucial to the project due to the necessity of a robust system design. Issues/risks that are not mitigated during this phase may compound over the next several phases.