Communication of Methodologies

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Example of Methodology Description

**Phase 2: System Level Design**

In Phase 0 you have developed a well defined problem with certain needs and constraints identified. You will have also identified metrics for measuring those needs and specifications relative to the metrics. In Phase 1 you have come up with concepts that attempt to meet the needs and specifications. However, it is imprudent, and likely impossible, to determine if all the needs and specifications can be achieved by viewing a project in the holistic way that is done in concept development. Most engineering problems are too complex to evaluate without decomposing the project into smaller pieces.

The purpose of system level design is to break the project into smaller systems which can be refined and evaluated more easily. The first step is to determine the required functions of the project. This can be achieved through functional decomposition. In Phase 0 and Phase 1 you likely identified some general functions that need to be performed by your project. However, these general functions will need to be decomposed into more refined functions.

*The general function of a camera is to take a picture but, there are other functions required in order to take the picture. The camera must be turned on, aimed, focused, triggered to capture image, etc.*

These sub functions will help you identify the systems needed for your project.

Based upon the functional decomposition and problem definition from Phase 0 you should be able to define an architecture which will define the project.

After identifying a project architecture and performing functional decomposition, you should be able to identify the systems which should be included in your project. Some will be more obvious than others so be sure to reference your functional decomposition, specifications, needs, and problem definition to ensure that your system choices meet the demands of the project.

With systems identified it is important to be cognizant of the interactions between these systems and ensure that they will not prevent the integration of the systems. The integration of these systems is done through what is referred to as interfacing. The selection of these interfaces is very important for the long term success of the project.
Feasibility

Risks (Importance):  (note: these are not all the risks, merely the most impactful risks)

- Failure to address the root cause (3)
- Lack of use (4)
- Description Rigidity (2)

Mitigations:

- Critiques from outside perspectives

Rationale for Feasibility:

The communication of methodologies is a tool which has limited risk. The two risks identified which could potentially contribute to the failure of the tool are avoidable with the proper preventive actions. By surveying outside people we will be able to gain insight into the clarity and flexibility of the methodology descriptions. Through iterative refinement we will be able to ensure that we have clearly described methodologies which will enhance the user experience and therefore encourage use of the tool. In order to evaluate the rigidity of our descriptions our survey will focus some questions on the inclinations of the respondent. We will ask questions regarding the specificity of actions the respondent believes they need to take. There will need to be a moderate amount of specificity to ensure that the respondent is being given direction without too much specificity which would lead to single minded outcomes.

With regard to the root cause risks, the impact of this risk would be unacceptable. We must first reiterate the focus of this tool. This tool aims to enhance the contextual understanding of the design process. When looking at the current state of contextual understanding it is clear that there are severe limitations. If the root cause of this lack of understanding has not in fact been appropriately identified then the tool would be rendered redundant. For this reason, it will be important to spend time to ensure that the appropriate cause is being addressed. This effort has already been incorporated into the planning going forward.