A meaningful needs and requirements document can be assessed using this checklist. The list is not necessarily in any order. The middle column can be completed with a three level Likert scale of high (good) / medium / low (H/M/L) assessment or simply a yes/no (Y/N) or a checkmark. The assessment is intended to apply to the entire needs and requirements document but can also be used when focusing on evaluating a single item. The right-hand column can be used to record feedback to explain the assessment in the middle column.

**Project / Team** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Reviewer** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

| **Evaluation criteria** | **H/M/L** | **Feedback** |
| --- | --- | --- |
| 1. The needs do not include specific solutions.
 |  |  |
| 1. The needs do not include values.
 |  |  |
| 1. The requirements do not include specific solutions, i.e., 'how' a need may be accomplished.
 |  |  |
| 1. Requirements are solution independent to allow multiple concepts to be generated.
 |  |  |
| 1. The requirements are measurable, and include measurement units.
 |  |  |
| 1. The numerical values for requirements make proper use of less than, greater than, equal to or between.
 |  |  |
| 1. Each requirement is associated with at least one need.
 |  |  |
| 1. The requirements are not “binary” as in, “the device must work”, “the device must be “safe”. Instead, look to specific measurable requirements.
 |  |  |
| 1. The needs focus on functionally defining what the project must do, i.e., what functions need to be performed / what features are important.
 |  |  |
| 1. The requirements focus on quantifying measurable things to achieve that help meet the goal(s).
 |  |  |
| 1. Each need has 2 or more associated requirements.
 |  |  |
| 1. Needs are expressed as the student team’s interpretations of customer statements and are not simply a copy of what the customer stated.
 |  |  |
| 1. The list of needs is sufficiently detailed as to fully define a “minimum viable product”.
 |  |  |
| 1. Each requirement refers to one, and only one, specific “thing”. Complex items must be broken into multiple requirements.
 |  |  |
| 1. Constraints are included based on Industry standards, legal or technical requirements.
 |  |  |
| 1. The requirements does not simply restate the need.
 |  |  |
| 1. The requirement should not simply state the units. For example, if the need is “low cost” and the target values are 150-200 then the units are dollars. The requirement cannot be “dollars”. It might instead be “retail sale price” or wholesale price”.
 |  |  |
| 1. Requirements do not simply refer to third party standards. Instead, they restate the specific items that apply.
 |  |  |
| 1. Needs and requirements avoid using opinion terms, e.g. “inexpensive”, “cheap”, “safe”, “small”.
 |  |  |
| 1. Needs include clarity as to why it is a need / the purpose of the need. For example, “system needs to keep temperature high” is weak while “system needs to be able to boil water” is strong.
 |  |  |
| 1. Needs are defined appropriately / separately corresponding to the user type(s). If there are multiple types of users, typically they may have different needs.
 |  |  |
| 1. Needs characterize the operating environment, e.g. location, environment, user skill levels, portability, etc.
 |  |  |
| 1. Needs associated with external interfaces, such as hardware and software, are clearly and separately called out.
 |  |  |
| 1. Non-functional requirements should be included as appropriate, e.g., response time, speed, etc. These must be grouped with their appropriate need.
 |  |  |
| 1. Focus is on engineering items rather than artistic / esthetic aspects.
 |  |  |
| 1. Needs and associated measurable requirements related to quality are included.
 |  |  |
| 1. If appropriate to the project, needs and measurable requirements involving any user interfaces are defined.
 |  |  |
| 1. Needs and associated measurable requirements related to security are defined.
 |  |  |
| 1. Needs and requirements are unambiguous.
 |  |  |
| 1. Requirements are verifiable / testable.
 |  |  |
| 1. Needs and requirements are realistic
 |  |  |
| 1. Needs and requirements are within the approved School of Engineering safety parameters.
 |  |  |
| 1. The needs and requirements are complete and consistent.
 |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Reminder that an indicator of a strong set of needs and requirements is that they can be handed to another engineering team to complete the design and implementation phases! So they need to be complete and accurate. In summary, could another team finish your project? If not, simply go back and fill in what is missing.

Comments: