

This excerpt is from the project entitled “Stylus Relief” addressing an issue that exists with using a stylus on touch sensitive computer and tablet screens.

This entry would be likely to receive a **score of 2**, based on the EDPPSR. It generated a great deal of discussion and some disagreement among a group of engineering educators who scored it. The entry is a good example of one that exhibits characteristics of several score points. Although the design requirements are not prioritized, a substantial number of them are listed in a clear format and are generally clear and detailed; at least some solution design requirements are supported with data and/or timely and credible references (typical of a score point 3 entry). The design requirements are generally objective and measurable—although some are very qualitative—and have the potential to lead to a tangible and viable solution to the problem identified.

The first solution design requirement—low cost (between \$10 and \$20) is based on survey results; without further detail about survey participants. This suggests that at least this requirement represents the needs of, and has been validated by, a primary stakeholder group (those individuals who might be interested in purchasing the device).

Had the solution design requirements been prioritized, the score would have been higher. Were they simply rank-ordered, the entry would have very likely been scored a 3. Were there some explanation of the basis for that order (e.g., why the top few were of the greatest importance), the entry might have even reached a 4.

Engineering Design Process Portfolio Scoring Rubric Component and Element Titles

Component I: Presenting and Justifying a Problem and Solution Requirements

- Element A: Presentation and justification of the problem
- Element B: Documentation and analysis of prior solution attempts
- **Element C: Presentation and justification of solution design requirements**

Component II: Generating and Defending an Original Solution

- Element D: Design concept generation, analysis, and selection
- Element E: Application of STEM principles and practices
- Element F: Consideration of design viability

Component III: Constructing and Testing a Prototype

- *Element G: Construction of a testable prototype*
- Element H: Prototype testing and data collection plan
- Element I: Testing, data collection and analysis

Component IV: Evaluation, Reflection, and Recommendations

- Element J: Documentation of external evaluation
- *Element K: Reflection on the design project*
- Element L: Presentation of designer’s recommendations

Component V: Documenting and Presenting the Project

- Element M: Presentation of the project portfolio
- Element N: Writing like an Engineer

Please Note: Elements M and N require no submission from the portfolio author(s) and are intended to be scored based on the portfolio work as a whole from what has been submitted from Elements A through L

Element C - Presentation and justification of solution design requirements

- 5** Design requirements are listed and prioritized, and they are consistently clear and detailed; these design requirements presented are consistently objective, measurable, and they would be highly likely to lead to a tangible and viable solution to the problem identified; there is evidence that requirements represent the needs of, and have been validated by, many if not all primary stakeholder groups.
- 4** Design requirements are listed and prioritized, and they are generally clear and detailed; these design requirements presented are nearly always objective and measurable, and they would be likely to lead to a tangible and viable solution to the problem identified; there is evidence that requirements represent the needs of, and have been validated by, several primary stakeholder groups.
- 3** Design requirements are listed and prioritized, and they are generally clear and somewhat detailed; these design requirements presented are generally objective and measurable, and they have the potential to lead to a tangible and viable solution to the problem identified; there is evidence that requirements represent the needs of, and have been validated by, at least a few primary stakeholder groups.
- 2** Design requirements are listed and prioritized, but some/all of these may be incomplete and/or lack specificity; these design requirements may be only sometimes objective and/or measurable, and it is not clear that they will lead to a tangible and viable solution to the problem identified; there is evidence that the requirements represent the needs, of/and or have been validated by, only one primary stakeholder group.
- 1** An attempt is made to list, format, and prioritize requirements, but these may be partial and/or overly general, making them insufficiently measurable to support a viable solution to the problem identified; there is no evidence that the requirements represent the needs of, or have been validated by, any primary stakeholder groups.
- 0** Design requirements are either not presented or are too vague to be used to outline the measurable attributes of a possible design solution to the problem identified.

Design Specifications:

1. Cost will be low (\$10 - \$20). This estimate is based on survey results where people stated that the average amount they would spend was \$15 on a device.
2. The product will have a useful life of two years and will be economically replaceable. In 2010, tablets were not a largely used or sold item. In just two years, tablets overtook the global network of PC sales ("The tablet market," 2012).
3. The product must display ease of use without specific training. "The companies that are successfully marketing new technologies to older people are not those that have created high-tech ways for seniors to open jars. Rather, they are the ones that have learned to create products that span generations, providing style and utility to a range of age groups" (Taub, 2008).
4. The product must be adaptable to the majority of hand sizes, both right and left handed. (Taub, 2008)
5. The product must not inhibit the use of the full screen of the tablet. Through a quick google search under shopping, most tablet screen sizes are about 8" x 10".
6. The product must not restrict freedom of hand movement, regardless of writing style.
7. The product must have some aesthetic appeal, but shall not overshadow functionality. DeOrlow(2000) suggests that "customers respond to visual appeal".
8. The product cannot restrict the use of buttons or other functionality of the tablet.
9. The product shall be designed with an awareness of ergonomic principles. Currently, there are no documented hand injuries as a result of using a tablet. However, carpal tunnel is a common symptom of overuse of a keyboard (Smith). We want to keep health risks low for our device.
10. The product shall adapt to 80% or more of the tablets currently on the market. A google search in shopping showed that most of the stylus' purchased for tablets work on any tablet. We think that is an important feature for our product as well.
11. The weight and portability of the product, when added to the tablet, shall not be significantly noticeable. Typical tablets weigh .75 lbs - 1.5 lbs ("Tablet pc comparison," 2012). The stylus accessory weighs around the same as a standard pen (about .75 oz). The stylus fits nicely in most tablet protectors. To reduce forces on the hand and make the product unnoticeable when used, the product will weigh less than 2 oz.

[Design Specifications references.pdf](#)

Design Specifications – References

- DeOrlow, I. A. (2000, Fall). *Creating visual appeal*. Retrieved from http://specialtyretail.com/issue/2000/10/merchandising-and-marketing/creating_visual_appeal/
- Smith, D. (n.d.). *Computer related health problems*. Retrieved from <http://www.mytechsupport.ca/forums/index.php?topic=942.0;wap2>
- Tablet pc comparison*. (2012). Retrieved from <http://www.tabletpccomparison.net/>
- Taub, E. (2008, August 27). For the advanced in age, easy-to-use technology . Retrieved from <http://www.nytimes.com/2008/08/28/technology/personaltech/28basics.html>
- The tablet market report*. (2012, January). Retrieved from <http://www.reportlinker.com/p0789001-summary/The-Tablet-Market-Report.html>